

Subject: **Mathematics**
 Year Group: **Year 12**

Content Delivered Core knowledge (Pure; Applied)		Content Delivered Core knowledge (Pure; Applied)		Content Delivered Core knowledge	
Autumn 1 September – October	Autumn 2 November – December	Spring 1 January - February	Spring 2 March - April	Summer 1 April - May	Summer 2 June-July
1. Data Collection 2. Measures of Location and Spread 3. Representations of Data 4. Algebraic Expressions 5. Quadratics 6. Equations and Inequalities 7. Graphs and Transformations	8. Correlation 9. Modelling (Mechanics) 10. Constant Acceleration 11. Forces and Motion 12. Straight Line Graphs 13. Circles 14. Algebraic Methods 15. Binomial Expansion 16. Trigonometric Ratios	17. Probability 18. Statistical Distributions 19. Trigonometric Identities and Equations	20. Hypothesis Testing 21. Variable Acceleration 22. Vectors 23. Differentiation 24. Integration	25. Exponential and Logarithms	Revision Cards Practice Papers Testing Year 2
Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:
<ul style="list-style-type: none"> Understand advantages and disadvantages of sampling Compare sampling techniques in context Calculate and interpret measures of location; Calculate and interpret measures of variation; Interpret diagrams for single-variable data Basic algebraic manipulation, indices and surds Quadratic functions Factorising, solving, graphs and the discriminant Solving equations 	<ul style="list-style-type: none"> Understand and interpret bivariate data including recognising outliers and using regression lines or equations Mathematical modelling for motion and forces, and the use of SI units Vector and scalar quantities Graphical representation of velocity, acceleration and displacement suvat formulae for motion under constant acceleration Newton's 1st, 2nd and 3rd laws 	<ul style="list-style-type: none"> Use mutually exclusive and independent events when calculating probabilities Use discrete distributions to model real-world situations; Identify the discrete uniform distribution Calculate probabilities using the binomial distribution Solve trigonometric equations within a given interval Use trig identities Solve equations involving trig identities 	<ul style="list-style-type: none"> Language of hypothesis testing Significance levels Carry out hypothesis tests involving the binomial distribution Use Calculus to determine rates of change for kinematics Magnitude and direction, addition and scalar multiplication of vectors Distance between two points and geometric problems Differentiating polynomials, second derivatives 	<ul style="list-style-type: none"> Use exponential functions and natural logarithms Use laws of logs Use exponential growth and decay in modelling Consider limitations and refinements of exponential models. 	<ul style="list-style-type: none"> Retrieval Practice

<ul style="list-style-type: none"> • Linear and quadratic inequalities including graphical solutions • Graphs – cubic, quartic and reciprocal • Transforming graphs and $f(x)$ notation 	<ul style="list-style-type: none"> • Parallel & perpendicular lines, length and area problems • Equation of a circle, geometric problems on a grid • Algebraic division, factor theorem and proof • The Binomial expansion • Understand trigonometric ratios and graphs 		<ul style="list-style-type: none"> • Tangents, normal, maxima and minima • Integration as opposite of differentiation, indefinite integrals of x^n • Definite integrals and areas under curves 		
Key Knowledge (Cultural Capital and Content):	Key Knowledge (Cultural Capital and Content):	Key Knowledge (Cultural Capital and Content):	Key Knowledge (Cultural Capital and Content):	Key Knowledge (Cultural Capital and Content):	Key Knowledge (Cultural Capital and Content):
<ul style="list-style-type: none"> • Understand how data is presented in the world around us • Understand how samples can inform us about patterns of behaviour in a whole population • Understand how quadratic functions model many real-life situations 	<ul style="list-style-type: none"> • Interpret relationships between real-life bivariate data • Understand how real-life forces and motion can be modelled simply in mechanics and solve simple and more complex everyday problems using modelling 	<ul style="list-style-type: none"> • Model real-world situations using probability distributions for discrete data 	<ul style="list-style-type: none"> • Understand how hypothesis testing can inform and impact decision-making • Understand how Calculus is used to find rates of change and area in a variety of real-life situations 	<ul style="list-style-type: none"> • Understand how exponential functions model many real-life situations i.e. bacteria growth, epidemics, economic and population growth/decline 	All Cultural Capital and Content learnt previously
Assessment:	Assessment:	Assessment:	Assessment:	Assessment:	Assessment:
<ul style="list-style-type: none"> • Baseline test – Pure, mid-September • Baseline test – Stats, end of September • Two end of unit online topic tests, one each of Pure and Stats • one end of unit written summative test in Pure 	<ul style="list-style-type: none"> • Two end of unit online topic tests, one each of Pure and Mechanics • one Pure multiple choice diagnostic question test • one Mechanics multiple choice diagnostic question test 	<ul style="list-style-type: none"> • January mock exam - one Pure and one Applied paper on content learnt to date • Two end of unit online topic tests, one each of Pure and Stats • one end of unit written summative test in Stats 	<ul style="list-style-type: none"> • Two end of unit online topic tests, one each of Pure and Mechanics • one end of unit written summative test in Mechanics • one Stats multiple choice diagnostic question test to 	<ul style="list-style-type: none"> • Two end of unit online topic tests, one each of Pure and Stats • one end of unit written summative test in Pure • one Mechanics multiple choice diagnostic question test to diagnose misconceptions 	<ul style="list-style-type: none"> • Revision cards x 25 • Practice papers x 10 • Summative assessment – two exam papers, one Pure and one Applied on ALL content

<ul style="list-style-type: none"> one Stats multiple choice diagnostic question test to diagnose misconceptions 		<ul style="list-style-type: none"> one Pure multiple choice diagnostic question test to diagnose misconceptions 	diagnose misconceptions		
Literacy Curriculum:					
<ul style="list-style-type: none"> Key mathematical terminology shared and discussed with students Frayer model used for explicit teaching of some key vocabulary in each unit Root words – including prefixes – and etymology will be explored for certain terminology to develop understanding of, and links within, subject content 					
Home Learning	Home Learning	Home Learning	Home Learning	Home Learning	Home Learning
<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests 	<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests 	<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests 	<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests 	<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests 	<ul style="list-style-type: none"> Completion of topic exercises post lesson Online Dr Frost Maths topic tests

Year Group: **Year 13**

Content Delivered Core knowledge (Pure; Applied)		Content Delivered Core knowledge (Pure; Applied)		Content Delivered Core knowledge	
Autumn 1 September – October	Autumn 2 November – December	Spring 1 January - February	Spring 2 March - April	Summer 1 April - May	Summer 2 June-July
26. Regression and Correlation 27. Probability 28. The Normal Distribution 29. Algebraic Methods 30. Functions and Graphs	31. Moments 32. Forces and Friction 33. Projectiles 34. Applications of Forces 35. Sequences and Series 36. Binomial Expansion	37. Radians 38. Trigonometric Functions 39. Trig and Modelling 40. Parametric Equations	41. Differentiation 42. Integration	43. Vectors 44. Numerical Methods 45. Further Kinematics Revision Cards Practice Papers Testing	Exams
Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:	Key Curriculum Skills:
<ul style="list-style-type: none"> Use knowledge of logarithms to reduce a relationship of the form $y=ax^n$ or $y=kb^x$ into linear form 	<ul style="list-style-type: none"> Understand and use moments in simple static contexts. Resolve forces in 2 dimensions and understand equilibrium, 	<ul style="list-style-type: none"> Use radians (exact values), to find arcs and sectors Definitions of secant, cosecant and cotangent and inverse trig functions 	<ul style="list-style-type: none"> Differentiate from first principles using compound angle formulae Differentiate products, quotients, implicit, 	<ul style="list-style-type: none"> Use of vectors in three dimensions; knowledge of column vectors and i, j and k unit vectors Locate roots using numerical methods 	Exams

<ul style="list-style-type: none"> • Calculate and interpret correlation coefficients and test zero correlation • Use set notation for probability and conditional probability • Understand and use the Normal distribution, perform hypothesis testing on the distribution's mean and approximate to the Binomial distribution • Simplify rational expressions including by factorising and cancelling, and algebraic division • Decompose rational functions into partial fractions • Proof by deduction* and proof by contradiction • Understand and use composite functions; inverse functions and graphs, and understand the modulus of a linear function • Understand the effect of simple transformations and combinations of these transformations. 	<p>statics and dynamics of a particle</p> <ul style="list-style-type: none"> • Understand and use the $F \leq \mu R$ model for friction • Model motion under gravity in a vertical plane, using vectors and projectiles • Solve problems involving parallel and non-parallel coplanar forces e.g. ladder problems • Work with sequences and series including those given by a formula for the nth term and those generated by a simple relation of the form $x_{n+1} = f(x_n)$ • increasing sequences; decreasing sequences; periodic sequences, geometric sequences • Expanding $(a + bx)^n$ for rational n; knowledge of range of validity and using partial fractions • Understand trigonometric ratios and graphs 	<ul style="list-style-type: none"> • Use compound, double, half and small angle formulae • Use $R \cos(x \pm \alpha)$ or $R \sin(x \pm \alpha)$ • Prove further trig identities and solving trig problems • Define and convert between parametric and Cartesian forms 	<p>parametric and trig functions and e^{kx}</p> <ul style="list-style-type: none"> • Integrate x^n (including when $n = -1$), exponentials and trigonometric functions • Find areas under curves using integration and the trapezium rule 	<ul style="list-style-type: none"> • Solve by iterative methods including staircase and cobweb methods • Understand and use the Newton-Raphson method • Use Calculus and find vectors \mathbf{r} and \mathbf{r}'' at a given time 	
<p>Key Knowledge (Cultural Capital and Content):</p>	<p>Key Knowledge (Cultural Capital and Content):</p>	<p>Key Knowledge (Cultural Capital and Content):</p>	<p>Key Knowledge (Cultural Capital and Content):</p>	<p>Key Knowledge (Cultural Capital and Content):</p>	<p>Key Knowledge (Cultural Capital and Content):</p>

<ul style="list-style-type: none"> Understand how exponential functions model many real-life situations i.e. bacteria growth, epidemics, economic and population growth/decline Understand how hypothesis testing can inform and impact decision-making in real-life Model real-world situations using probability distributions for continuous data 	<ul style="list-style-type: none"> Understand how real-life forces and motion can be modelled simply in mechanics and solve simple and more complex everyday problems i.e. ladder problems, using modelling Understand how algebraic functions model many real-life situations 	<ul style="list-style-type: none"> Understand how real-life problems involving trig can be modelled simply and solved using pure mathematics 	<ul style="list-style-type: none"> Understand how hypothesis testing can inform and impact decision-making Understand how Calculus is used to find rates of change and area in a variety of real-life situations 	<ul style="list-style-type: none"> Understand how real-life forces and motion can be modelled simply in mechanics and solve simple and more complex everyday problems using modelling 	<ul style="list-style-type: none"> All Cultural Capital and Content learnt previously
Assessment:	Assessment:	Assessment:	Assessment:	Assessment:	Assessment:
<ul style="list-style-type: none"> Provisional mock mid-September Two end of unit online tests, one each of Pure and Stats one written end of unit topic test in Stats one Pure multiple choice diagnostic question test to diagnose misconceptions 	<ul style="list-style-type: none"> Two end of unit online tests, one each of Pure and Mechanics one written end of unit topic test in Pure one Mechanics multiple choice diagnostic question test to diagnose misconceptions 	<ul style="list-style-type: none"> January mock exam - one Pure and one Applied paper on content learnt to date Two end of unit online tests, one each of Pure and Mechanics one Pure multiple choice diagnostic question test to diagnose misconceptions 	<ul style="list-style-type: none"> Two end of unit online tests, one each of Pure and Mechanics one Pure multiple choice diagnostic question test to diagnose misconceptions Practice papers 	<ul style="list-style-type: none"> Revision cards x 20 Practice papers 	<ul style="list-style-type: none"> Final exams – 2 x Pure (2hrs each) and 1 x Applied paper (1hr)
Literacy Curriculum:					
<ul style="list-style-type: none"> Key mathematical terminology shared and discussed with students Framer model used for explicit teaching of some key vocabulary in each unit Root words – including prefixes – and etymology will be explored for certain terminology to develop understanding of, and links within, subject content 					
Home Learning	Home Learning	Home Learning	Home Learning	Home Learning	Home Learning
<ul style="list-style-type: none"> Completion of topic exercises post lesson 	<ul style="list-style-type: none"> Completion of topic exercises post lesson 	<ul style="list-style-type: none"> Completion of topic exercises post lesson 	<ul style="list-style-type: none"> Completion of topic exercises post lesson 	<ul style="list-style-type: none"> Completion of topic exercises post lesson 	<ul style="list-style-type: none"> None

<ul style="list-style-type: none">• Online Dr Frost Maths topic tests	<ul style="list-style-type: none">• Online Dr Frost Maths topic tests	<ul style="list-style-type: none">• Online Dr Frost Maths topic tests	<ul style="list-style-type: none">• Online Dr Frost Maths topic tests• Completion of practice papers	<ul style="list-style-type: none">• Completion of revision card and practice papers• Online Dr Frost Maths topic tests	
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