

Curriculum Plan

Department/subject: Mathematics - Year 12 Summer Term

Our Vision: **We take opportunities and aspire to excellence**

Our Intent:

- All students will experience a curriculum richness, breadth and depth
- The curriculum equips every student with the knowledge and skills for the future in our local area and beyond
- The curriculum builds on prior knowledge and creates a ‘web of knowledge’
- Gaps in knowledge and skills are identified and addressed quickly

Year	Summer 1	Summer 2
Knowledge to be taught	<p>Pure: Integration – integrating x to the n, indefinite integral, finding functions, definite integrals, areas under curves, area under the x axis, areas between curves and lines Exponentials and Logs – exponential functions, $y = e$ to the x, exponential modelling, logarithms, laws of logarithms, solving equations using logarithms, working with natural logarithms, logarithms and non-linear data.</p> <p>Applied: Hypothesis Testing – hypothesis testing, finding critical values, one-tailed tests, two-tailed tests Forces and Motion – force diagrams, forces as vectors, forces and acceleration, motion in 2 dimensions, connected particles, pulleys</p>	<p>Pure: Algebraic Methods – proof by contradiction, algebraic fractions, partial fractions, repeated factors, algebraic division. Functions and Graphs – the modulus function, functions and mappings, composite functions, inverse functions, modulus of a function and modulus in a function, combining transformations, solving modulus problems.</p> <p>Applied: Variable Acceleration – functions of time, using differentiation, maxima and minima problems, using integration, constant acceleration formula. Regression, correlation and hypothesis testing – exponential models, measuring correlation, hypothesis testing of zero correlation.</p>
Key Words	<p>Pure: Integration – differentiate, integrate, constant, function, polynomial, indefinite, definite, bounded. Exponentials and Logs – exponential, real, increase, decrease, logarithm.</p>	<p>Pure: Algebraic Methods – contradiction, rational, irrational, substituting, equating coefficients, partial Functions and Graphs – modulus, mapping, domain, range, many to one, one to one.</p>

	<p>Applied: Hypothesis Testing – population parameter, null hypothesis, alternative hypothesis, significance level, critical region Forces and Motion – accelerate, resultant, vector, gravity, weight, smooth pulley</p>	<p>Applied: Variable Acceleration –differentiate, integrate, displacement, velocity, acceleration, Regression, correlation and hypothesis testing – logarithms, correlation, PMCC.</p>
Links to prior knowledge	<p>Pure: Integration – differentiation (Spring 2) Exponentials and Logs – exponential graph (GCSE and Autumn 1)</p> <p>Applied: Hypothesis Testing – Binomial distribution (Year 12 Spring 2) Forces and Motion – modelling in mechanics (Year 12 Spring 1)</p>	<p>Pure: Algebraic Methods – Algebraic Methods (Year 12 Autumn 2) Functions and Graphs – Graphs and Transformations (Year 12 Autumn 1)</p> <p>Applied: Variable Acceleration – differentiation (Year 12 Spring 2), integration (Year 12 Summer 1) Regression, correlation and hypothesis testing – Year 12 Autumn 2, Summer 1.</p>
How knowledge is assessed	<p>Knowledge is assessed through both a formative and a summative approach. Teachers will use some of the following:</p> <ul style="list-style-type: none"> ● Baseline assessments ● Quizzes ● Retrieval Starter questions ● Teacher questioning throughout the lessons ● Mini white boards ● True or false activities ● Student’s discussion and presentations <p>At the end of teaching every topic students complete a fundamentals test that is either self, peer or teacher assesses. This highlights gaps in knowledge so that these can be recapped prior to their end of topic test.</p>	<p>Knowledge is assessed through both a formative and a summative approach. Teachers will use some of the following:</p> <ul style="list-style-type: none"> ● Baseline assessments ● Quizzes ● Retrieval Starter questions ● Teacher questioning throughout the lessons ● Mini white boards ● True or false activities ● Student’s discussion and presentations <p>At the end of teaching every topic students complete a fundamentals test that is either self, peer or teacher assesses. This highlights gaps in knowledge so that these can be recapped prior to their end of topic test.</p>

	Teachers mark and feedback the challenge test which is recorded on SIMs.	Teachers mark and feedback the challenge test which is recorded on SIMs. Students sit a mock exam which is teacher marked and feedback to students. This is based on all content covered so far.
How gaps will be addressed	Staff analyse fundamentals test results and will provide in lesson intervention where necessary to develop students understanding of the key concepts. Staff highlight areas of concern and discuss focus points with students following their challenge tests. Staff provide re-tests for students that needed to do more work on a given topic.	Staff have students mock results which gives an indication of where students currently are and identifies students who will need more support and this support is provided in the form of intervention. Staff analyse fundamentals test results and will provide in lesson intervention where necessary to develop students understanding of the key concepts. Staff highlight areas of concern and discuss focus points with students following their challenge tests. Staff provide re-tests for students that needed to do more work on a given topic.
Cultural capital lessons	Problem solving will be embedded into lessons where students will learn to UNPACK problems pulling together different mathematical skills. Links to 'real life' maths will be made to give concept to mathematical skills. This is particularly clear in the applied mathematics involving statistics and mechanics.	Problem solving will be embedded into lessons where students will learn to UNPACK problems pulling together different mathematical skills. Links to 'real life' maths will be made to give concept to mathematical skills. This is particularly clear in the applied mathematics involving statistics and mechanics.