

MATHEMATICS CURRICULUM PLAN



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| SUBJECT: | Maths | YEAR GROUP: | 10 (Higher Tier) |
| COURSE: | GCSE Mathematics | EXAM BOARD: | Edexcel |
| SUBJECT INTENT: | <p>In Year 10, students are given the opportunity to develop their understanding of the interconnected nature of maths and apply knowledge acquired at Key Stage 3 in more complex and sophisticated ways. Students will continue to experience problems that go beyond routine and repetition so they will be required to think about what skills or concepts need to be applied in different contexts. Our aim in Year 10 is to help students become more confident and resilient problem solvers by encouraging them to try out different methods and make mistakes to see what works and what doesn't.</p> <p>Students will also be formally introduced to GCSE exam style questions and will have the opportunity to develop their exam techniques. We explore common errors and misconceptions, layout and workings, command words, checking answers, and mastering using a calculator.</p> | | |

| Term | Topic | Core learning | Sequencing | Specification link |
|--|--|--|--|--|
| Autumn Term 1 7 Weeks | Indices and Surds 3 weeks (12 hrs) | Student will <ol style="list-style-type: none"> 1. Use index laws. 2. Calculate values using negative and fractional indices. 3. Manipulate surds including working with brackets and rationalizing. | <p>Building on... Year 8 laws of indices and Year 9 algebraic manipulation including factorising.</p> <p>Building towards... These skills will be used in numerous topics throughout Year 10 and 11 including trigonometry and quadratics. Students will need to be able to work comfortably with surds to perform exact calculations. A strong understanding of Surds and indices is also vital for the study of calculus at A level.</p> | N7, N7h, A4, A4h, N8h |
| | Advanced Trigonometry 3 weeks (12 hrs) | Students will <ol style="list-style-type: none"> 1. Recall knowledge on Pythagoras and trigonometric relationships 2. Solve problems with right-angled triangles without a calculator using exact values. 3. Apply the sine and cosine rules to solve 2D and 3D problems. 4. Calculate the area of triangle using the sine rule. | <p>Building on... Pythagoras' Theorem in Year 8 and the use of trigonometric ratios in Year 9.</p> <p>Building towards... This unit will cover the concepts needed in more complex Key Stage 4 units i.e. bearings problems and segment areas. Trigonometry is also a fundamental topic at A level.</p> | R12, G20, G20h, G21, G22h, G23h |
| Consolidation / Assessment and feedback 1 week (4 Hrs) | | | | |

| Term | Topic | Core learning | Sequencing | Specification link |
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| Autumn Term 2 8 Weeks | Quadratics 4 weeks (16 hrs) | Students will <ol style="list-style-type: none"> 1. Solve quadratic equations through factorising, completing the square and the quadratic formula. 2. Draw, sketch and interpret quadratic graphs. | <p>Building on... Factorising expressions and solving linear equations were covered throughout Key Stage 3. Students were also introduced to quadratic graphs in Year 9.</p> <p>Building towards... This unit will build towards students solving quadratic simultaneous equations in Year 10 as well as quadratic inequalities. Fluency in solving quadratic equations is also a key skill at A level.</p> | A4, A4h, A11, A11h, A12, A12h, A18, A18h, |
| | Simultaneous Equation 3 weeks (12 hrs) | Students will <ol style="list-style-type: none"> 1. Solve simultaneous linear equations by elimination and substitution. 2. Solve simultaneous equations where one is linear, and one is quadratic. 3. Form simultaneous equations. | <p>Building on... Students will build on their algebraic fluency developed throughout Years 7, 8 and 9 including substitution, simplifying, and solving equations. In Year 9 they were introduced to the concept of solving simultaneous equations graphically. They will also solve quadratic equations in this unit, which they learnt in their previous Year 10 unit.</p> <p>Building towards... This unit will build student ability to answer Key Stage 4 exam style questions that require writing and solving simultaneous equations. This is often linked to geometrical problems. This is also a fundamental skill at A level.</p> | A19, A19h, A21 |
| Consolidation / Assessment and feedback End of Autumn Term Assessment 1 week (4 Hrs) | | | | |

| Term | Topic | Core learning | Sequencing | Specification link |
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| Spring Term 1 6 Weeks | Straight Line Equations 3 weeks (12 hrs) | Students will <ol style="list-style-type: none"> 1. Work out the midpoint of a line 2. Work out the gradient between two points, from an equation or a graph 3. Form an equation and manipulate equations 4. Work with parallel and perpendicular lines and gradients | <p>Building on... Students were introduced to linear graphs for the first time in Year 9. Students created tables of values, drew graphs and worked with $y = mx + c$.</p> <p>Building towards... Students will further develop their knowledge to answer complex Key Stage 4 exam style questions that require extensive knowledge of linear functions. Students will also need these skills in the unit on inequalities and the unit on tangent to a circle. Coordinate geometry skills are also a key component of A level maths.</p> | A9, A9h, A10, A12, R14 |
| | Ratio 2 weeks (8 hrs) | Student will <ol style="list-style-type: none"> 1. Use ratio to solve geometric, statistical, and number problems. 2. Use ratio to solve problems that involve algebraic manipulation. | <p>Building on... This unit builds on Key Stage 3 proportion and ratio units. Students will go into greater depth and learn to solve problems involving changing ratios.</p> <p>Building towards... Ratio problems appear in numerous other topics throughout Year 10 and 11 particularly the unit on vectors.</p> | R5, R6, R7, R8 |
| Consolidation / Assessment and feedback 1 week (4 Hrs) | | | | |

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|----------------------------|--|--|--|---------------------|
| SPRING 2 5 weeks | Equations and inequality 2 weeks (8 hrs) | Students will <ol style="list-style-type: none"> 1. Recall solving linear equations. 2. Solve linear and quadratic inequalities and use appropriate notation including representing on a number line. 3. Represent inequalities on a coordinate grid and shade out the boundary that does not satisfy the inequality. 4. Understand and use discrete and continues values. | <p>Building on... Students will build on their equation- solving skills developed throughout Key Stage 3 and earlier in Year 10, as well as their knowledge of liner functions.</p> <p>Building towards... This unit will provide students with skills needed to answer many Key Stage 4 exam questions that involve any linear or quadratic equation or inequality. Exam questions may require students to create equations or inequalities based on a worded problem or geometrical problem and then solve for missing values.</p> | A22, A22h |
| | Arc, Sectors and Segments 1 week (4 hrs) | Student will <ol style="list-style-type: none"> 1. Recall parts of circles and area and circumference of circles. 2. Calculate arc lengths and sector area of circles. 3. Work out missing values when given lengths or areas. 4. Calculate the area of a segment and arc length. | <p>Building on... In Year 8 students completed a unit on circles that involved area and circumference as well as fractions of circles i.e. half, quarter etc. They will now answer more complex questions, and also draw on their Year 10 trigonometry unit in order to find the area of segments.</p> <p>Building towards... This unit provide students with the skills to answer complex Key Stage 4 exam questions that involve area and perimeter.</p> | G18 |
| | Congruence 1 weeks (4 hrs) | Students will <ol style="list-style-type: none"> 1. Identify congruent shapes and understand the conditions for congruent triangles. 2. Understand similarity to make geometric inferences and identify similar shapes. 3. Compare lengths, areas, and volumes of similar shapes. | <p>Building on... In Year 9 students learnt to identify scale factors and calculate missing lengths in similar shapes and enlargements. This unit also builds on previous units on ratio.</p> <p>Building towards... This unit will provide students with essential skills needed to access high level Key Stage 4 exam style questions as well as challenging volume questions such as the volume of a frustum.</p> | R12, G5, G6 |

| Term | Topic | Core learning | Sequencing | Specification link |
|--|---|--|--|--------------------|
| Summer Term 1 6 Weeks | Summarising data 3 weeks (12 hrs) | Students will <ol style="list-style-type: none"> 1. Work with qualitative, discrete, continuous, grouped, ungrouped data. 2. Use lists, tables or diagrams to work out mean, median, mode, range and interquartile range. 3. Work out averages of grouped data. 4. Identifying outliers. 5. Compare distributions to make decisions about a hypothesis. 6. Draw and interpret box plots. | <p>Building on... Students started to understand the data handling cycle and were introduced to averages in Year 7, analysis skills were developed further in year 9.</p> <p>Building towards... This unit will cover concepts that students will need to apply throughout the Year 11 unit on statistical measures.</p> | S4, S4h |
| | Volume and Surface area 2 weeks (8 hrs) | Students will <ol style="list-style-type: none"> 1. Work out the surface area of solids including compound solids. 2. Work out the volume of solids including compound solids. 3. Solve real-life problems using known solid shapes. 4. surface area and volume of spheres, pyramids, cones and composite solids | <p>Building on... In Year 8 students worked with the area and volume of regular polygons, cubes and cuboids, this included surface area. In year 9 students developed this by introducing circles and cylinders</p> <p>Building towards... This unit will deepen students' understanding of volume and surface area in order to solve complex exam style questions. These skills also come up at A level in optimisation problems.</p> | G16, G17 |
| Consolidation / Assessment and feedback 1 week (4 Hrs) | | | | |

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| Summer Term 2 7 weeks | Compound measures and bound calculations 2 weeks (8 Hrs) | Students will <ol style="list-style-type: none"> 1. Recall speed, distance and time 2. Recall mass, density and volume 3. Work with compound measures including unit conversions. 4. Plot and interpret distance-time graphs 5. Combine upper and lower bounds appropriately to achieve an overall maximum or minimum for a situation. 6. Use inequality notation to specify error intervals due to truncation. | <p>Building on...</p> <p>Students have been introduced to compound measures in maths and science at Key Stage 3, and studied a unit on accuracy and measures in Year 9.</p> <p>Building towards...</p> <p>This unit supports learning in science, and also builds towards a Year 11 maths unit on area under a curve and gradient of a curve.</p> | R1, R11, A14, N15, N16, N16h |
| | Probability and systematic listing 2 weeks (8 Hrs) | Students will <ol style="list-style-type: none"> 1. Compare theoretical probabilities with relative frequencies. 2. Complete and use a frequency tree. 3. Know when to add or multiply probabilities. 4. Complete and use a tree diagram or Venn diagram to calculate probabilities of independent and dependent events. 5. Apply systematic listing strategies. | <p>Building on...</p> <p>This unit builds on several Key Stage 3 probability units where students studied the concepts of fairness, probabilities, and expectation. Students were introduced to Venn diagrams in Year 8 and tree diagrams in Year 9.</p> <p>Building towards...</p> <p>This unit will build towards students answering complex Key Stage 4 exam style questions that involve probability, including those involving algebra and quadratics.</p> | P1, P2, P3, P4, P5, N5 |

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| | <p>Growth and Decay 1 weeks (4 Hrs)</p> | <p>Students will</p> <ol style="list-style-type: none"> 1. Percentage increase and decrease 2. Reverse percentages 3. Simple and compound interest problems 4. Use of calculators to explore exponential growth and decay problems and use iterative process. | <p>Building on... This unit builds on several Key Stage 3 percentage units where students worked out percentage increase and decrease using multipliers.</p> <p>Building towards... This unit will build towards students answering complex Key Stage 4 exam style questions that requires solving problems involving repeated proportional change and exponential growth.</p> | |
| <p>Consolidation / Assessment and feedback 1 week (4 Hrs) Year 10 Mocks (Paper 1 and Paper 2)</p> | | | | |