

# YEAR 12 CURRICULUM INFORMATION - Mathematics

|                                                | Spring 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Spring 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
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| What will students be learning?                | Pure unit 4 Trigonometry<br>Pure unit 5 Vectors<br>Statistics Unit 3 Probability<br>Statistics Unit 4 Statistical distributions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Pure unit 6 Differentiation<br>Pure unit 7 Integration<br>Statistics Unit 5 Hypothesis testing<br>Mechanics Unit 8 Forces and motion                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| How will students be assessed?                 | 1 pure checkpoint assessment<br>1 applied checkpoint assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 1 pure checkpoint assessment<br>1 applied checkpoint assessment                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Literacy – What keywords will be taught?       | Sine, cosine, tangent, interval, period, amplitude, function, inverse, angle of elevation, angle of depression, bearing, degree, identity, special angles, unit circle, symmetry, hypotenuse, opposite, adjacent, intercept. Vector, scalar, magnitude, direction, component, parallel, perpendicular, modulus, dimension, ratio, collinear, scalar product, position vectors. Sample space, exclusive event, complementary event, discrete random variable, continuous random variable, mathematical modelling, independent, mutually exclusive, Venn diagram, tree diagram. Binomial, probability, discrete distribution, discrete random variable, uniform, cumulative probabilities. | Differentiation, derivative, first principles, rate of change, rational, constant, tangent, normal, increasing, decreasing, stationary point, maximum, minimum, integer, calculus, function, parallel, perpendicular. Calculus, differentiate, integrate, reverse, indefinite, definite, constant, evaluate, intersection. Hypotheses, significance level, one-tailed test, two-tailed test, test statistic, null hypothesis, alternative hypothesis, critical value, critical region, acceptance region, p-value, binomial model, accept, reject, sample, inference. Hypotheses, significance level, one-tailed test, two-tailed test, test statistic, null hypothesis, alternative hypothesis, critical value, critical region, acceptance region, p-value, binomial model, accept, reject, sample, inference. Force, newtons, mass, weight, gravity, tension, thrust, compression, air resistance, reaction, driving force, braking force, resultant, force diagram, equilibrium, inextensible, light, negligible, particle, smooth, uniform, pulley, string, retardation, free particle. |
| What employability skills are being developed? | The specific value of maths as a required or preferred subject for particular careers e.g. <ul style="list-style-type: none"> <li>Engineers and engineering technicians</li> <li>Surveyors and surveying technicians</li> <li>Systems analysts</li> <li>Actuaries</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                             | The specific value of maths as a required or preferred subject for particular careers e.g. <ul style="list-style-type: none"> <li>Engineers and engineering technicians</li> <li>Surveyors and surveying technicians</li> <li>Systems analysts</li> <li>Actuaries</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

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|                         | <ul style="list-style-type: none"> <li>• Accountants</li> <li>• Operational researchers</li> <li>• Chemists</li> <li>• Software engineers</li> <li>• Statisticians</li> </ul>                                                                                                                                                                                                                                                                 | <ul style="list-style-type: none"> <li>• Accountants</li> <li>• Operational researchers</li> <li>• Chemists</li> <li>• Software engineers</li> <li>• Statisticians</li> </ul>                                                                                                                                                                                                                                                                 |
| Wider Curriculum Links? | <p><b>Physics</b><br/> Trigonometry (sine waves)<br/> SUVAT<br/> Logarithms<br/> Exponentials<br/> Simultaneous equations</p> <p><b>Chemistry</b><br/> Graphs<br/> Quadratics<br/> Logarithms<br/> Rearranging formulae</p> <p><b>Biology</b><br/> Graphs<br/> Surface area and volume<br/> Logarithms</p> <p><b>Business</b><br/> Percentages<br/> Graphs</p> <p><b>Psychology</b><br/> Scatter graphs<br/> Venn diagrams<br/> Box plots</p> | <p><b>Physics</b><br/> Trigonometry (sine waves)<br/> SUVAT<br/> Logarithms<br/> Exponentials<br/> Simultaneous equations</p> <p><b>Chemistry</b><br/> Graphs<br/> Quadratics<br/> Logarithms<br/> Rearranging formulae</p> <p><b>Biology</b><br/> Graphs<br/> Surface area and volume<br/> Logarithms</p> <p><b>Business</b><br/> Percentages<br/> Graphs</p> <p><b>Psychology</b><br/> Scatter graphs<br/> Venn diagrams<br/> Box plots</p> |

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| What useful websites are there for this topic?                                              | <a href="http://www.mathsgenie.co.uk">www.mathsgenie.co.uk</a><br><a href="http://www.drfrust.co.uk">www.drfrust.co.uk</a><br><a href="http://www.resourceaholic.co.uk">www.resourceaholic.co.uk</a><br><a href="http://www.crashmaths.co.uk">www.crashmaths.co.uk</a><br><a href="http://www.physicsandmathstutor.co.uk">www.physicsandmathstutor.co.uk</a> | <a href="http://www.mathsgenie.co.uk">www.mathsgenie.co.uk</a><br><a href="http://www.drfrust.co.uk">www.drfrust.co.uk</a><br><a href="http://www.resourceaholic.co.uk">www.resourceaholic.co.uk</a><br><a href="http://www.crashmaths.co.uk">www.crashmaths.co.uk</a><br><a href="http://www.physicsandmathstutor.co.uk">www.physicsandmathstutor.co.uk</a> |
| What wider reading could be done for this topic?                                            | <p><b>Bridging GCSE &amp; A Level Maths by Mark Rowland</b><br/> Published by Collins<br/> ISBN: 978 0 00741 023 1</p> <p><b>AS-Level Maths Head Start</b><br/> Published by CGP Workbooks<br/> ISBN: 978 1 84146</p>                                                                                                                                        | <p><b>Bridging GCSE &amp; A Level Maths by Mark Rowland</b><br/> Published by Collins<br/> ISBN: 978 0 00741 023 1</p> <p><b>AS-Level Maths Head Start</b><br/> Published by CGP Workbooks<br/> ISBN: 978 1 84146</p>                                                                                                                                        |
| What else can students be doing independently to develop their understanding of this topic? | <p>Complete topic booklets from <a href="http://physicsandmathstutor.co.uk">physicsandmathstutor.co.uk</a><br/> Complete exam packs to develop examination skills.<br/> Complete old specification past papers for extra practise.</p>                                                                                                                       | <p>Complete topic booklets from <a href="http://physicsandmathstutor.co.uk">physicsandmathstutor.co.uk</a><br/> Complete exam packs to develop examination skills.<br/> Complete old specification past papers for extra practise.</p>                                                                                                                       |