Higher Maths

Year 11

William Hulme's Grammar School
The best in everyone™
Part of United Learning

Overview	The purpose of the Maths curriculum is to equip students with uniquely powerful ways to describe, analyse and solve problems and to make them more prepared for the real world. We do this by providing a secure understanding of mathematical concepts, from basic principles of mathematics to complex topics that combine several areas of study into a single question. In Year 1 we continue to concentrate on retention of knowledge and depth of learning. In doing this, all our students have the opportunity to master key skills that might be required in their future development. **As we enter \year 11 all sets will have reached a different point in the curriculum so while we have a set Scheme of Work, each group will be adapted to start at the point they reached in the Year 10 Scheme of Work.**

	Half Term 1	Half Term 2	Assessment
Autumn Term	**Recurring Decimals** ■ Change recurring decimals into their corresponding fractions ■ By writing the denominator in terms of its prime factors, decide whether fractions can be converted to recurring or terminating decimals (Recognise that every terminating decimal has its fraction with a 2 and/or 5 as a common factor in the denominator **Quadratic Sequences** ■ Find the nth term of quadratic sequences **Simultaneous Equations** ■ Solve quadratic equations (that also require rearrangement) by factorising, completing the square and by using the quadratic formula ■ Solve linear/quadratic simultaneous equations ■ Solve quadratic equations arising from algebraic fraction equations ■ Be able to identify from a graph if a quadratic equation has any real roots ■ Solve linear/circles simultaneous equations	**Further Trig** ■ Sine rule and cosine rule ■ Area of a triangle using trigonometry. Also use to find sides or angles of any triangle ■ Sketch and interpret graphs of the trigonometric functions $y = \sin x$, $y = \cos x$ and $y = \tan x$ ■ Apply sine and cosine rule to questions involving bearings ■ Pythagoras in 3D configurations ■ Trigonometry in 3D configurations **Inequalities** ■ Plotting graphs of quadratic functions ■ Interpreting graphs of quadratic functions ■ Finding the turning point of a quadratic graph by completing the square ■ Solving quadratic inequalities **Functions** ■ Substituting into functions ■ Substituting into composite functions ■ Finding composite functions ■ Finding inverse functions (including fractional)	In Year 11 we do a past paper assessment every fortnight, these are a mix of seen and unseen papers. **Half Term 2.** At the end of November, we do United Learning Mock GCSE 1 (this consists of 3 papers)

	Half Term 3	Half Term 4	Assessment
Spring Term	**Iteration** ■ Find approximate solutions to equations numerically using iteration ■ Use iteration with simple converging sequences ■ Substituting into iterative formulae	**Gradient and area under a graph** ■ Finding the gradient of the radius that meets the circle at that point (circles all centre the origin) ■ Finding the gradient of the tangent perpendicular to it	In Year 11 we do a past paper assessment every fortnight, these are a mix of seen and unseen papers.

Proof
- Language of proof: odd, even, product, sum, integer, consecutive, square, difference etc.
- Solve 'Show that' and proof questions using consecutive integers (n, n + 1), squares a2, b2, even numbers 2n, odd numbers 2n +1

Circle Theorems
- Angles subtended at the centre or circumference of a circle
- Angles in segments and cyclic quadrilaterals
- Circle theorems for chords and tangents
- Alternate segment theorem
- Mixed problems: Circle theorems
- Proving the circle theorems

Histograms
- Drawing histograms with equal class widths
- Drawing histograms with unequal class widths
- Interpreting histograms
- Calculating averages from histograms

- Using the given point
- Estimate area under a quadratic or other graph by dividing it into trapezia.
- Interpret the results in cases such distance–time graphs, velocity–time graphs and graphs in financial contexts
- Interpret the gradient of linear or non-linear graphs, and estimate the gradient of a quadratic or non-linear graph at a given point by sketching the tangent and finding its gradient
- Interpret the gradient of non-linear graph in curved distance–time and velocity–time graphs

Graphical Transformations
- Translating graphs
- Reflecting graphs
- Transforming graphs

Congruency
- Identify congruent shapes by eye
- Understand that distances and angles are preserved under reflections, so that any figure is congruent under this transformation.

Constructions & Loci
- Draw circles and arcs to a given radius or given the diameter
- Measure and draw lines, to the nearest mm
- Measure and draw angles, to the nearest degree

Half Term 4
Just before Easter Break. We do United Learning Mock 2 (this consists of 3 papers.

	Half Term 5	Half Term 6	Assessment
Summer Term	■ At this point in the year the individual teacher plan individual lessons to either complete the Scheme of Work or to Revise topics that have been identified as weaknesses.	■ EXAMINATIONS	In Year 11 we do a past paper assessment every fortnight, these are a mix of seen and unseen papers

Useful Resources for Supporting Your Child at Home:	Homework:
https://whgs-academy.sparxmaths.uk/student/ https://www.drfrostmaths.com/login.php https://curriculum.unitedlearning.org.uk/Pupil?r=96980 https://mmerevise.co.uk/	Homework is set weekly by teachers on SPARX.