Rayner Stephens HIGH SCHOOL

Year 11 – Mathematics – Higher Tier				
Curriculum intent	Mathematics is a creative and highly interconnected discipline. It is essential to everyday life; underpinning many other subjects such as science, geography and technology and is essential for most forms of employment. Through mathematics lessons we promote mathematical thinking to allow all students to achieve their mathematical potential and engage in the study of mathematics. Learners are taught strategies to solve problems and are encouraged by teacher modelling to be able to express themselves in mathematical language. The Key Stage 4 scheme of learning allows students to build on their understanding of the interconnected topics from Key Stage 3. Learners in Year 11 will retrieve, affirm, and extend their knowledge and understanding as we finish the curriculum and prepare for the GCSE examinations. Learners will continue to follow either the Foundation tier or the Higher Tier pathway. Learners are regularly assessed to ensure that they are following the correct pathway in Mathematics. The journey starts with geometrical reasoning, where students learn to apply angle facts and clearly state their justifications for their reasoning. Students will deepen their understanding of probability; they will be encouraged to look at the data and consider bias etc. and how outcomes change depending on events that have already happened. Geometrical skills are further developed when studying shapes including finding the surface area and volume of complex 3D shapes, constructions, and similar shapes and again use deductive reasoning to prove if shapes are similar or congruent. Algebraic skills are refined and enhanced as they approach the end of the curriculum content, when studying simultaneous equations, transforming graphs, algebraic and geometric proof and working with the equation of a circle. Following the completion of the curriculum coverage, they will follow a revision plan that targets gaps in their knowledge as identified by the thorough question level analysis of each student's performance in the frequent assessments that take place. This will prepare them for success in the GCSE examinations.			
Term	**Autumn 1**	**Autumn 2**	**Spring 1**	**Spring 2 to GCSE Examinations**
Knowledge	• Alternate and Corresponding Angles • Interior and Exterior Angles • Pie Charts • Probability • Probability Trees • Conditional Probability • Product Rule • Circles • Arcs and Sectors • Surface Area and Volume	• Transformations • Enlargements inc. Fractional and/or Negative • Constructions • Congruence and Proof • Similar Shapes in 2D and 3D • Quadratic Equations inc. Completing the Square • Iteration • Simultaneous Equations	• Simultaneous Quadratic Equations • Graphing Inequalities • Velocity Time Graphs • Cumulative Frequency & Box Plots • Histograms • Circle Geometry • Circle Theorems • Functions • Transformation of Graphs • Algebraic Proof • Vectors	**Revision** In preparation for the final exams, learners will complete revision of selected topics covered in years 9 to 11 based on their performance in mock exams. Learners should also be completing independent revision in preparation for final exams.

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Skills	Autumn 1	Autumn 2	Spring 1	Spring 2 to GCSE Examinations
	• Find missing angles using angle facts and demonstrate understanding of the properties of angles in 2D shapes and in parallel lines. Justify all answers using geometrical reasoning. • Read and interpret pie charts including comparative pie charts. • Find the probability of an event or multiple events occurring using the AND & OR rules. • Use, design, and interpret probability trees to calculate the probability of an event happening. • Find the probability of an event happening given that an event has already happened. • Use the product rule for counting and problem-solving. • Recall and use formulae for the circumference and area of a circle. • Find the perimeters and areas of sectors. • Calculate the area of compound shapes made from triangles, rectangles, trapezia and parallelograms. • Find the surface area and volume of prisms, including compound solids and complex solids such as cones, spheres and pyramids.	• Be able to transform shapes by rotation, reflection and translation on a coordinate grid. Enlarge shapes by a given scale factor including fractional and/or negative scale factors. • Construct bisectors of angles and lines, construct angles and identify regions using constructions. Use constructions to answer loci questions. • Identify and use the rules of congruence for triangles to prove if triangles are congruent. • Identify similar shapes, find, and use the scale factor to find missing lengths, areas and volumes using 2D and 3D shapes. • Solve quadratic equations by completing the square. • Use an iterative process to solve a quadratic or cubic equation. • Write and solve two linear simultaneous equations both algebraically and using a graph. • Be able to solve equations simultaneously where one is linear and the other is a quadratic or a circle, both algebraically and from a graph.	• Draw linear inequalities on a coordinate grid and use to define an area that satisfies the inequalities. • Using a velocity time graph, calculate estimates for the speed and the distance travelled. • Plan, collect and analyse data to complete a statistical investigation. • Read, draw, interpret and compare cumulative frequency graphs and box plots. • Read, draw, and interpret histograms. Use histograms to calculate averages and make inferences from the data provided. • Using the equation of a circle, find the equation of a tangent to the circle. • Use and apply circle theorems to find missing angles in geometrical problems involving circles. • Use function notation, find the inverse of a function and work with composite functions. • Transform functions when plotted on a coordinate grid. • Be able to plot and identify and use the graphs of trigonometric ratios. • Use algebraic reasoning to justify a statement or to prove by counter argument. • Solve geometric problems by using vector notation.	•Revision topics will be selected based in individual class performance in the mock exams. •Using detailed analysis of assessments that have been completed, areas of weakness will be identified. These will be the topics of focus during in class revision. •To ensure that gaps are constantly being identified and addressed, learners will complete regular in-class assessments which will be used to inform planning and monitor progress. **It is essential to complement in class revision that all learners are completing independent revision and attending after school revision in addition to the revision that will be completed in class.**

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Term	Autumn 1	Autumn 2	Spring 1	Spring 2
Assessments	• Regular low stakes assessments at the end of each topic. • Past GCSE Paper – non-calculator.	• Regular low stakes assessments at the end of each topic.	• Regular low stakes assessments at the end of each topic. • Year 11 Mocks Full GCSE series – 1 x non-calculator 2 x calculator	• Regular low stakes assessments at the end of revision topic. • Regular in-class assessments to aid revision and retrieval and build exam skills. • Final GCSE Papers
Enrichment	• Make sure you are attending after school revision! • Have you had your five a day? Consolidate your learning by completing the Corbettmaths five a day. Visit https://corbettmaths.com/ to find daily questions to challenge you. • Have you used the interactive questions on https://vle.mathswatch.co.uk/vle/ yet? Watch the videos and answer the interactive questions linked to the video. How many can you get correct?	• Prepare for your mock examinations by completing online papers on https://www.onmaths.com/ Can you take on the Demon Questions? • Do the 6-week MathsWatch Revision Schedule in preparation for your mock exams. Not sure where to find it – ask your teacher for more details. • Make some flash cards of the key formulae that you need to learn for the exam. Do not forget to include the area of triangle, trapezium, and circles. Do you need to make flash cards for the exact trig values?	• Found a topic that you are struggling with? Try using https://corbettmaths.com/ This website has videos, questions and past exam questions to help you revise. • 10 Mark March Can you get an extra 10 marks on each paper? Use the feedback from your assessments to see where you can get an extra 10 marks for each paper – 30 marks should move you up a grade!	• Remember the best way to revise maths is to do maths! Answer lots of revision questions. Try Maths Genie for past papers and questions on https://www.mathsgenie.co.uk/ • Calculator skills are the priority now. Use the resources you have been given by your teacher and make sure you are revising using Corbettmaths, MathsWatch and Maths Genie. • Make sure you are attending after school revision!