Rayner Stephens
HIGH SCHOOL

Year 8 - Mathematics	
Curriculum intent	Through mathematics lessons we promote mathematical thinking to allow all students to achieve their mathematical potential and engage in the study of mathematics. Using a mastery style approach to develop learners' fluency, reasoning and problem solving through a concrete, pictorial and abstract approach, building upon their learning from Year 7. As students progress through their learning topics from previous learning with be interleaved into future learning so students develop application and skill links between different areas of mathematics. In Year 8, learners will continue their journey in mathematics exploring methods for calculations which secure the fundamental knowledge and problem solving required for the years ahead. Much of this will deepen learner understanding of mathematical methods, using physical manipulatives and exploring a variety of methodologies. As students progress through the year, students will continue to explore geometrical properties of circles and three-dimensional shapes. Students will continue to expand their use of number and calculations from the beginning of the year and apply this to discovering shape properties and calculating area and circumference of circles and finding the volume and surface area of 3D shapes. Students will further their skills and understanding of mathematics through extending their knowledge of statistics and applying this to calculating averages and their ability to read and use frequency tables. This unit will link to real life concepts and explore associated topics to apply these skills. Students will further apply the knowledge of geometry to transformations whereby they will understand geometric terminology and how this applied to transforming shapes including reflections, translations, rotations and enlargement whilst considering similarity and congruence. Completing the year in the summer term students will be applying the mathematical knowledge that they have acquired to further explore graphs, algebraic calculations, terminology and finally angle geometric rules. Students will also use mathematical equipment to construct and measure angles to aid students to prove geometric rules.

Term	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Knowledge	• Calculations	• Circle and shape properties and measurement 3D shapes	• Averages and Frequency Tables	• Transformations	• Graphs and Equations	• Angles

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Skills	• Increase capability and application of operations involving integer, negative and decimal values. • Understand contextual calculation problems in a variety of contexts applicable to real life. • Increase familiarity with mental methods and mathematical processes in order to solve mathematical reasoning and problem solving questions. • Use and calculate using numbers written in standard form. • Use and calculate using surds.	• Understand the mathematical components of circles and apply formula to find the area and circumference of circles. • Identify 3D Shapes and understand properties associated with 3D Shapes. • Be able to understand how to calculate volume and surface area of cuboids.	• Calculate, apply and use averages in multiple contexts and on different examples of frequency graphs. • Design and interpret different frequency diagrams. • Evaluate statistical diagrams and tools to comment on results	• Understand the different types of symmetry and how they are recorded. • Explore the different ways in which an object can be transformed into its image. • Describe the different transformations using the correct mathematical terminology.	• Understand algebraic notation and how it is applied. • Understand that to be able to plot a graph, substitution into an equation takes place. • Identify vertical, horizontal and diagonal lines by their equations. • Explore different ways of solving mathematical equations.	• Understand and apply angle rules to differing geometric problems, including parallel lines. • Draw and measure angles accurately, using a protractor. • Use and apply bearings to geometric problems. • Describe and draw shapes accurately using elevations.

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Assessments	End of topic assessment: Calculations	End of topic assessments: 3D shapes and Circles	End of topic assessments: Averages and Frequency	End of topic assessment: Transformations	End of topic assessment: Graphs and Equations	End of topic assessment: Angles
Enrichment	• Can you manage your money for three months? Try the budget game! https://natwest.mymoneysense.com/students/students-12-16/the-budget-game/ • You're throwing a birthday party for your friend. What will you do and how much will it cost? • Make a how to use your calculator guide! It will come in helpful for future learning.	• Try your skills at the oriental art of origami! For ideas of what you could make try looking at the British museum: https://blog.britishmuseum.org/make-your-own-Origami-inspired-by-japanese-prints/?gclid=CjwKCAjwuIWHBhBDEiwACXQYsbrQFNPVb4Bu2sdV7beYhHCMjjvfHuM3lfaLLe31klnxCkHfxd1O1RoCc9IQAvD_BwE • Investigate different nets of boxes – have a look at how packaging is put together and the shapes need to contain different products. Can you find any interesting shapes? • Use coloured paper and fold (no scissors allowed) to make different polygons!	• Try out some of the UKMT Junior Challenge questions – some students get the chance to enter in February!) https://www.interactive-maths.com/ukmt-random-question-generator.html • In a newspaper, how many statistics can you find? Consider why they have been used – was it effective? • You are trying to prove to someone that you are a brilliant Mathematician – how can you use averages and your homework scores to prove this?	• Did you know that paper sizes are an enlargement of another? Can you find the ratio of the enlargements? https://nrich.maths.org/7385 • Try the activity Mirror, Mirror… to reflect images in two lines of reflection. https://nrich.maths.org/5458	• Explore differed equations of graphs using Desmos. https://www.desmos.com/calculator • Star Product Sudoku. https://nrich.maths.org/6224 • Translating lines. Investigate what happens to the equation when you move the line. https://nrich.maths.org/6539	• Practise reading from a protractor with Angles Aliens Attack game: https://mathsframe.co.uk/en/resources/resource/470/Angle-Alien-Attack • What is important about angles in order for shapes to tessellate? Have a go at tessellating shapes and even try some similar to the famous Mathematician Escher! https://stemactivitiesforkids.com/2019/10/08/create-a-simple-tessellation/ • You've got to work out the direction to get to your friends who are in the park. Try estimating your bearing from objects/friends. See if your friends agree!