



**CURRICULUM MAP (Long term plan)**

**SUBJECT: Maths**

**YEAR GROUP : 11**

	<b>Cycle 1 Autumn</b>	<b>Cycle 2 Spring</b>	<b>Cycle 3 Summer</b>
<b>Substantive knowledge</b> – Essential knowledge & conceptual understanding of the National Curriculum	Probability, algebra, number, geometry, ratio and proportion <b>17 – Geometric review(F)</b> <b>17 - Circle theorems (H)</b> <b>18 - Standard Form</b> <b>19 - Real life graphs and measures</b> <b>20 - Bivariate data</b> <b>21 - Probability</b> <b>22 - Transformations</b> <b>23 - Congruence and similarity</b>	Geometry, number, ratio and proportion, algebra <b>24 - Sequences</b> <b>25 - Functions</b> <b>26 - Solving equations review (F)</b> <b>26 - Numerical methods (H)</b> <b>27 - Graphs and functions</b> <b>28 - Number revision (F)</b> <b>28 - Transformation of functions (H)</b> <b>29 - Geometry review (F)</b> <b>29 - Scalene triangle trigonometry (H)</b>	Geometry <b>30 - Vectors</b>  <b>Exam preparation</b>
<b>Disciplinary knowledge</b> - what skills are practised?	<b>17 – Geometric review (F)</b> - Areas and perimeters - Angle rules - Scale drawings and bearings <b>17 – Circle Theorems (H)</b> - Angle rules for parallel lines review - circle properties and theorems <b>18 - Standard Form</b> - Recognise format for standard form - Convert between standard form and ordinary form - Order and compare standard form - Calculate with standard form with and without a calculator <b>19 - Real life graphs and measures</b> - Read and construct distance/speed/time graphs	<b>24 - Sequences</b> - Generate sequences from patterns and Nth term rules - Find the Nth term for linear, quadratic and geometric sequences - Recognise and use common sequences (fibonacci, fractional) <b>25 - Functions</b> - Interpret expressions as functions - Find expressions for inverse and composite functions <b>26 - Solving equations review (F)</b> - Expand and simplify algebraic expressions - Solve linear equations <b>26 - Numerical methods (H)</b>	<b>30 - Vectors</b> - Add and subtract vectors - Read and write the column vector and diagram representations for vectors - Resolve vectors - Find parallel vectors - Proof with vector diagrams <b>Exam preparation</b> - Targeted revision

	<ul style="list-style-type: none"> <li>- Use gradient as a rate of change</li> <li>- Calculate with compound units (speed, pressure, density)</li> <li>- Convert standard measures including compound measures</li> <li>- Find the area under a graph</li> </ul> <p><b>20 - Bivariate data</b></p> <ul style="list-style-type: none"> <li>- Plot and analyse scatter diagrams</li> <li>- Plot and use a line of best fit</li> <li>- Identify correlation</li> </ul> <p><b>21 - Probability</b></p> <ul style="list-style-type: none"> <li>- Recognise and use a probability scale</li> <li>- Calculate probabilities for single and multiple events</li> <li>- Use sample space diagrams, tree diagrams, and Venn diagrams</li> <li>- Find probabilities for dependant and independent events</li> <li>- Read and write set notation for Venn diagrams</li> </ul> <p><b>22 - Transformations</b></p> <ul style="list-style-type: none"> <li>- Draw and describe transformations (reflection, rotation, translation, enlargement)</li> <li>- Use fractional and negative scale factors</li> <li>- Describe and summarise multiple transformations</li> </ul> <p><b>23 - Congruence and similarity</b></p> <ul style="list-style-type: none"> <li>- Recognise and use properties for congruent shapes and triangles</li> <li>- Recognise and use properties for similar shapes and triangles</li> <li>- Calculate missing lengths, areas and volumes for similar solids using area and volume scale factors</li> </ul>	<ul style="list-style-type: none"> <li>- Solve equations using iterative methods</li> <li>- Read and use subscript notation</li> </ul> <p><b>27 - Graphs and functions</b></p> <ul style="list-style-type: none"> <li>- Find solutions to equations graphically (linear, quadratic, simultaneous)</li> <li>- Sketch and interpret quadratic graphs</li> <li>- Recognise cubic and reciprocal graphs</li> <li>- Recognise and use trigonometric graphs</li> <li>- Recognise and use the equation of a circle</li> </ul> <p><b>28 - Number revision (F)</b></p> <ul style="list-style-type: none"> <li>- Review written methods with integers, decimals and fractions</li> <li>- Review of number types, HCF, LCM</li> </ul> <p><b>28 - Transformation of functions (H)</b></p> <ul style="list-style-type: none"> <li>- Reflect functions</li> <li>- Translate functions</li> </ul> <p><b>29 - Geometry review (F)</b></p> <ul style="list-style-type: none"> <li>- Pythagoras and trigonometry review</li> </ul> <p><b>29 - Scalene triangle trigonometry (H)</b></p> <ul style="list-style-type: none"> <li>- Pythagoras and SohCahToa review</li> <li>- Use and calculate with the Sine rule and Cosine rule</li> <li>- Use the formula for area of a scalene triangle</li> <li>- 3D trigonometry</li> </ul>	
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<p><b>Key questions</b> (What is the learning about?)</p>	<p>Can students use the functions on the calculator effectively? Do the students understand when to use Pythagoras theorem? Can the students recite or derive the exact values for <math>\sin q</math>, <math>\cos q</math> and <math>\tan q</math> for <math>q = 0, 30, 45, 60</math> and <math>90</math> degrees? Can students understand the upper and lower bounds of a rounded number and how these can in turn affect a larger calculation? Can students understand the data distribution in a histogram and link it to other data representations? Can students interpret statistical measures in context and compare summary data?</p>	<p>Are students able to control construction equipment and use them effectively? Are students able to reverse a percentage change and understand the common misconception of removing a percentage? Are students able to show working to support solutions even when carried out on a calculator? Are students able to set up algebraic proportion equations?</p>	<p>Are students able to manipulate algebraic equations with accuracy? Have the students a secure understanding of the link between graphical and algebraic simultaneous equation solutions? Are students fluent with the formats for representing inequalities?</p>
<p><b>Assessment</b></p>	<p>Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC for each topic followed by individual marking and targeted fix it tasks EOTT</p>	<p>Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC for each topic followed by individual marking and targeted fix it tasks EOTT</p>	<p>Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC for each topic followed by individual marking and targeted fix it tasks Mock examinations</p>
<p><b>Literacy (L), Numeracy (N), Oracy (O) opportunities</b></p>	<p>Word problems presented to students each lesson where they have to understand the mathematical vocabulary to solve the problems. Answers to questions posed by the teachers are answered using mathematical language with reasoning where appropriate developing key vocabulary and confidence in talking mathematically. Peer on peer support when answering questions in class. Key words are displayed at the beginning of each lesson and in their knowledge organisers for the topic.</p>		
<p><b>Cross Curricular Opportunities</b></p>	<p>Reference to links with science for compound measures.</p>		
<p><b>Super Curriculum</b> (personal development)</p>	<p><b>UKMT Challenge</b> <b>Sparx Maths</b></p>	<p><b>UKMT Challenge</b> <b>Sparx Maths</b></p>	<p><b>Sparx Maths</b></p>

<b>Careers</b>	HT 1 <a href="#">Careers in operational research (collection of videos)</a> HT 2 <a href="#">Aerodynamicist</a>	HT1 <a href="#">Maths in the Navy</a> HT2 <a href="#">Opportunities when you study STEM</a>	HT1 <a href="#">Where STEM can take you</a>
<b>Equality and Diversity</b> Gender Disability Religion Race Sexuality	Diverse representation used with slides presented to students. Maths display boards has a Mathematician of the Month and also Famous Mathematicians from Around the World. <ul style="list-style-type: none"> <li>• University of Nottingham videos about <a href="#">women in maths</a></li> <li>• Isaac Newton institute looking at <a href="#">diversity in mathematics</a></li> <li>• University of Nottingham <a href="#">Undergraduate students for women in maths</a></li> </ul>		
<b>Local Community Links</b>	N/A	N/A	N/A
<b>British Values</b> Democracy The rule of Law Individual Liberty Mutual Respect and Tolerance of others SMSC Character Education	<p>Across the school, we encourage respect including teaching the value of listening to others views and opinions on problem solving. Students know it is okay to make mistakes and know this is how we learn; we encourage students to find their specific errors and then learn from these leading to deeper learning.</p> <p>In classrooms, we look for opportunities for pupils to use mini-whiteboards to promote self-esteem and build self-confidence. Collaborative learning in the classroom is encouraged in the form of listening and learning from each other which develops their mathematical voice and logical reasoning skills. We participate in team maths challenges for increased pupil involvement.</p> <p>We explicitly teach areas of Maths in lots of different subjects across the school to show students the importance of Maths in different roles, for example: statistics in Geography and Science; finance in Citizenship; chronology in History and proportion in Food Tech.</p>		