

**CURRICULUM MAP (Long term plan)**

**SUBJECT: Maths**

**YEAR GROUP : 9**

|  | <b>Cycle 1<br/>Autumn</b>   | <b>Cycle 2<br/>Spring</b>  | <b>Cycle 3<br/>Summer</b>  |
|--|---|--|--|
| <b>Substantive knowledge</b> – Essential knowledge & conceptual understanding of the National Curriculum | Geometry, algebra and number<br><b>G10 – Congruence and construction</b><br><b>A9 – Index laws</b><br><b>N11 – Standard form</b><br><b>A10 – inequalities</b><br><b>G11 – Similar shapes</b><br><b>G12 - Pythagoras</b>   | Statistics, number, geometry and probability<br><b>S4 – Bi-variate data</b><br><b>S5 – Continuous data</b><br><b>N12 – Further percentages</b><br><b>G13 – Compound units</b><br><b>P3 – Further probability</b><br><b>G14 – Right angled trigonometry</b>   | Algebra, number and functional skills<br><b>A11 – Further straight line graphs</b><br><b>A12 – Introduction to quadratics</b><br><b>A13 – Quadratic and geometric sequences</b><br><b>N13 – Using prime factors</b><br><b>PE3 – Targeted project and functional work</b>   |
| <b>Disciplinary knowledge</b> - what skills are practised?   | <b>G10 – Congruence and construction</b><br>-Angle rule revision<br>-Identify and calculate values in congruent shapes and triangles<br>-Know and use the special conditions for congruent triangles<br>-Accurately construct triangles<br>Identify angles in tessellating polygons<br><br><b>A9 – Index laws</b><br>-Understand how to use the laws of indices to simplify formulae<br><br><b>N11 – Standard form</b><br>-Write large and small numbers in standard form<br>-Converting standard form numbers to normal form | <b>S4 – Bi-variate data</b><br>-Interpret and plot scatter diagrams<br>-Understand and name the different types of correlation<br>-Use a scatter diagram to interpolate and predict<br><br><b>S5 – Continuous data</b><br>-Interpret and populate grouped frequency tables<br>-Know how to calculate an estimated mean from a grouped frequency table<br>-Plot frequency polygons<br><br><b>N12 – Further percentages</b><br>-Know how to use a decimal multiplier for percentage change | <b>S3 – Averages from tables</b><br>- Calculate averages from frequency tables for discrete data<br><b>A7 – Using formulae and equations</b><br>- Expand and factorise single brackets<br>- Form and solve equations for problems<br><b>A11 – Further straight line graphs</b><br>-Know how to solve a linear equation with it's graph<br>-Find the equations of parallel and perpendicular lines<br>-Form the equation of line through a point and gradient<br>-Form the equation of a line through 2 points<br><br><b>A12 – Introduction to quadratics</b> |

|  |   |   |  |
|--|---|---|--|
|  | <ul style="list-style-type: none"> <li>-Perform calculations with standard form numbers both with and without a calculator</li> </ul> <p><b>A10 – inequalities</b></p> <ul style="list-style-type: none"> <li>-Representing inequalities on a line and cartesian plane</li> <li>-Solve inequalities algebraically</li> <li>-Find integer solutions for inequalities</li> </ul> <p><b>G11 – Similar shapes</b></p> <ul style="list-style-type: none"> <li>-Understand the definition for similar shapes</li> <li>-Identify and find missing values in similar shapes and triangles</li> <li>-Know and use the special conditions for similar triangles</li> <li>-Calculate and use linear, area and volume scale factors</li> <li>-Make links between angle rules in parallel lines and similar triangles</li> </ul> <p><b>G12 – Pythagoras</b></p> <ul style="list-style-type: none"> <li>-Know and use the Pythagoras formula</li> <li>-Find missing sides in triangles using Pythagoras</li> <li>-Use Pythagoras to solve perimeter problems of other compound shapes</li> <li>-Solve problems in context with triangles</li> </ul> | <ul style="list-style-type: none"> <li>-Calculate repeated percentage change in steps and with the formula</li> <li>-Calculate an original amount using a reverse percentage change</li> </ul> <p><b>G13 – Compound units</b></p> <ul style="list-style-type: none"> <li>-Revise the graphs and formula for distance speed and time ( including the graph)</li> <li>-Know and calculate with the unit of pressure</li> <li>-Know the formula and calculate with density</li> <li>-Convert compound units into different units</li> </ul> <p><b>P3 – Further probability</b></p> <ul style="list-style-type: none"> <li>-Understand what is meant by exhaustive events</li> <li>-Calculate missing probabilities from exhaustive events</li> <li>-Interpret and construct frequency trees, Venn diagrams and probability trees</li> <li>-Know the product rule and develop a systematic listing strategy</li> </ul> <p><b>G14 – Right angled trigonometry</b></p> <ul style="list-style-type: none"> <li>-Fully label the sides of a right angles triangle</li> <li>-Learn the ratios of Sine, Cosine and Tangent to use sohcahtoa</li> <li>-Find missing sides in right angled triangles using the trig ratios</li> </ul> | <ul style="list-style-type: none"> <li>-Expand 2 (and 3) brackets</li> <li>-Factorise simple quadratics</li> <li>-Plot quadratics using a table of values</li> <li>-Find estimated solutions to quadratics graphically</li> </ul> <p><b>A13 – Quadratic and geometric sequences</b></p> <ul style="list-style-type: none"> <li>-Identify common sequences</li> <li>-Classify sequences from their properties (linear, quadratic, geometric, Fibonacci)</li> <li>-Generate sequences from their term to term rule or nth term rule</li> <li>-Find the nth term for quadratic and geometric sequences</li> </ul> <p><b>N13 – Using prime factors</b></p> <ul style="list-style-type: none"> <li>-Find HCF and LCM from prime factors</li> <li>Find cube roots from prime factors</li> </ul> <p><b>PE3 – Targeted project and functional work</b></p> <ul style="list-style-type: none"> <li>-Targeted mini project and purposeful functional practise</li> </ul> |
|--|---|---|--|

|  |  |  |   |
|--|--|--|---|
|  |  | -Find missing angles in right angled triangles using the trig ratios   |   |
| <b>Key questions</b><br>(What is the learning about?)      | <p>Can students use construction tools effectively?</p> <p>Can students write large and small numbers in standard form?</p> <p>Do the students understand how to use Pythagoras theorem?</p> <p>Can students use Pythagoras to determine if a triangle is right angled?</p> <p>Can students understand the change in scale factor for areas and volumes?</p> <p>Are students able to represent linear equalities on a number line?</p> <p>Are students able to represent inequalities on a graph?</p>            | <p>Can the students recite 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?</p> <p>Can students apply the sum of probabilities is = 1?</p> <p>Are students able to use frequency trees, two-way tables and Venn Diagrams to solve probability questions?</p> <p>Have the students a secure understanding of distance/speed/time relationship?</p> <p>Can students interpret 'real-life' graphs?</p> | <p>Do students know a systematic method for working out prime factors?</p> <p>Do students have a method for working out what type of sequence a sequence is?</p> <p>Can students interpret statistical measures in context and compare summary data?</p> <p>Can students choose appropriate formats to present data for clear interpretation?</p> |
| <b>Assessment</b>  | <p>Live marking during the lesson with misconceptions addressed during the lesson.</p> <p>End of topic PPC for each topic</p> <p>EOTT</p>  | <p>Live marking during the lesson with misconceptions addressed during the lesson.</p> <p>End of topic PPC for each topic</p> <p>EOTT</p>  | <p>Live marking during the lesson with misconceptions addressed during the lesson.</p> <p>End of topic PPC for each topic</p> <p>EOYT</p>   |
| <b>Literacy (L), Numeracy (N), Oracy (O) opportunities</b> | <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 a new lesson. Spellings are corrected during live marking and book reviews.</p> |  |   |
| <b>Cross Curricular Opportunities</b>                      | Links to DT and Art  | Probability links to most topics as a 'preference'.  | Links to DT, Art and ICT.   |
| <b>Super Curriculum</b><br>(personal development)          | UKMT Challenge<br>Sparx maths  | UKMT Challenge<br>Sparx maths  | UKMT Challenge<br>Sparx maths   |

|  |  |     |     |
|--|--|-----|-----|
| <b>Careers</b>   | <p>Careers will be referenced within the teaching of each topic outlining how maths is used in a vast array of careers - not just at university level.</p> <p>Inspiring careers using maths:<br/>         How to become an <a href="#">accountant</a><br/>         How <a href="#">fantasy football</a> scored me a job<br/>         Maths in becoming a <a href="#">chef</a></p>  |     |     |
| <b>Equality and Diversity</b><br>Gender<br>Disability<br>Religion<br>Race<br>Sexuality   | <p>Diverse representation used with slides presented to students.</p> <p>Maths display boards has a Mathematician of the Month and also Famous Mathematicians from Around the World.</p> <p><a href="#">Diversity in maths</a> - podcast by Hannah Fry<br/> <a href="#">Maths is everywhere</a> - Ted Ed presentation</p>  |     |     |
| <b>Local Community Links</b>   | N/A  | N/A | N/A |
| <b>British Values</b><br>Democracy<br>The rule of Law<br>Individual Liberty<br>Mutual Respect and Tolerance of others<br>SMSC<br>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> |     |     |