CURRICULUM MAP (Long term plan)

SUBJECT: Maths **YEAR GROUP : 9**

	Cycle 1 **Autumn**	**Cycle 2** **Spring**	**Cycle 3** **Summer**
Substantive knowledge – Essential knowledge & conceptual understanding of the National Curriculum	Number and Proportion and Geometry **NP12 – Standard Form** **GM4 – Congruence and Similarity** **GM5 – Right-angled Triangles**	Algebra and Statistics and Probability **A8 – Linear Inequalities** **SP3 – Introduction to Probability** **A9 – Contextual Graphs**	Geometry and Statistics and Probability **GM6 – Circles** **GM7 – Advanced Drawing, Measuring and Constructing** **SP4 – Continuous Data**
Disciplinary knowledge - what skills are practised?	**NP12 – Standard Form**: - Large numbers in standard form. - Small numbers in standard form. - Converting from 'almost standard' form to standard form. - Comparing numbers in standard form (and "almost standard" form). - Adding and subtracting in standard form, by converting to normal form and by using distributivity. - Multiplying and dividing in standard form (using commutativity). - Problems and applications, including order of operations. - SI prefixes and engineering form. **GM4 – Congruence and Similarity**: - Congruence – introduction. - Tessellating congruent shapes to fill the plane. - Isometries - translation (as a vector), reflection and rotation, including rotational and reflective symmetry, combinations of transformations, including successive translations.	**A8 – Linear Inequalities**: - Representing single (e.g. $x>3$) and double (e.g. $3<x<5$) linear inequalities on a number line. - Solve single linear inequalities in one variable, represent the solution(s) on a number line and algebraically using set notation. - Solve compound linear inequalities in one variable, representing the solution(s) on a number line. - Solve systems of multiple linear inequalities in a single variable using number lines. - Setting up inequalities from contexts. - Represent inequalities involving only x or y by shading on a graph. **SP3 – Introduction to Probability:** - Systematic listing (product rule for counting). - Record, describe and analyse the frequency of outcomes of simple probability experiments, introduce language of probability.	**GM6 – Circles**: - Circle parts and properties. - Circumference of a circle (and semi/quarter circles), in terms of pi and rounded. - Area of a circle (recap) and semi/quarter circles, in terms of pi and rounded. - Problems with circumference and area of a circle. - Length of an arc and area of a sector. - Identifying and using the circle theorems. **GM7 – Advanced Drawing, Measuring and Constructing**: - Interior and exterior angles in polygons. - Converting between 2D and 3D units of measurement. - Naming and recognising polyhedral, labelling conventions, Euler's Formula (F + V - 2 = E); drawing 3D shapes - normal and isometric.

	- Similarity of length, proving shapes are similar, finding scale factors and writing equivalent sides as equivalent ratios. - Enlargement (including negative and fractional enlargements) - knowing that enlargements produce similar shapes. - Conditions for congruent triangles - simple examples, getting familiar with terms. **GM5 – Right-angled Triangles**: - Pythagoras' Theorem in 2D to find missing sides. - Proving a triangle is right-angled with Pythagoras. - Identifying Pythagorean triples. - Pythagoras to find the distance between two points. - Trigonometric ratios for finding missing sides in right-angled triangles. - Trigonometric ratios for finding missing angles in right-angled triangles. - Exact values of sinq, cosq and tanq for q = 0, 30, 45, 60, 90 by heart. - Problems involving Pythagoras and trigonometry (including bearings), method selection practice.	- Theoretical probability - formalising language and notation, calculating. - Sum of probabilities of all mutually exclusive events = 1. - Generate theoretical sample spaces, including systematic listing of combinations and outcomes, and use these to calculate probabilities. - Recording outcomes and possibilities using frequency trees, two-way tables and simple Venn diagrams - use these diagrams to calculate probabilities. **A9 – Contextual Graphs**: - General "real-life" graphs, interpreting y-intercepts as a fixed value/charge, etc, and gradient as a rate of change in context. - Drawing, reading from and extrapolating from conversion graphs. - Introduction to speed, distance, time. - Distance-time graphs, including finding the average speed, and the speed of a section as the gradient of the line. - Velocity-time graphs, including finding the acceleration as the gradient and displacement as the area under the graph.	- 2D representations of 3D shapes - constructing and interpreting nets, plans and elevations. - Planes of symmetry. - Loci - fixed distance from a point, fixed distance from a line, equidistant from two points, equidistant from two lines. **SP4 – Continuous Data**: - Measures of central tendency of grouped data - mean, mode and median. - Graphical representations of continuous and grouped data - cumulative frequency and boxplots (unequal and equal class widths). - Measures of spread - interquartile range, including why it is better than the range. - Compare data sets through graphs, central tendency and spread.
Key questions (What is the learning about?)	Can students write large and small numbers in standard form? Have the students a secure understanding of the four transformations?	Are students able to represent linear equalities on a number line? Are students able to represent inequalities on a graph? Can students apply the sum of probabilities is = 1?	Have the students a secure understanding of the language associated with circles? Can the students convert between 2D and 3D measures? Can students interpret statistical measures in context and

	Do the students understand how to use Pythagoras theorem? Can the students recite the exact values for sinq, cosq and tanq for q = 0, 30, 45, 60 and 90 degrees?	Are students able to use frequency trees, two-way tables and Venn Diagrams to solve probability questions? Have the students a secure understanding of distance/speed/time relationship? Can students interpret 'real-life' graphs?	compare summary data? Can students choose appropriate formats to present data for clear interpretation?
Assessment	Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC: Standard Form, Congruency and Similarity and Right-angled Triangles. EOTT	Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC: Linear Inequalities, Introduction to Probability and Contextual Graphs. EOTT	Live marking during the lesson with misconceptions addressed during the lesson. End of topic PPC: Circles, Advanced Drawing, Measuring and Constructing and Continuous Data. EOYT
Literacy (L),**Numeracy** (N), **Oracy** (O) **opportunities**	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.		
Cross Curricular Opportunities	Links to DT and Art	Probability links to most topics as a 'preference'.	Links to DT, Art and ICT.
SMSC / Character/Careers (C) (personal development)	**Moral -** 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. **Social -** 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. **Cultural -** 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.		
Equality and Diversity	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.		

Super Curriculum (personal development)	**UKMT Challenge** **Dr Frost Maths**	**UKMT Challenge** **Dr Frost Maths**	**UKMT Challenge** **Dr Frost Maths**