

# YEAR 9 MATHS CURRICULUM PROGRESSION OVERVIEW

## Subject Curriculum Intent

The learning at Key Stage 3 is sequenced to allow students to become fluent in the fundamentals of mathematics, to develop reasoning skills and to apply knowledge to solve problems. All units interleave crucial knowledge and skills from prior learning at Key Stage 3 as from the Key Stage 2 National Curriculum topic areas of Number, Ratio and proportion, Algebra, Geometry, Measurement and Statistics. This ensures that students build upon prior learning and have secure retention of knowledge over time.

Previous equation skills are linked to representing inequalities and rearranging formulae and then to drawing and interpreting linear graphs. Then both 2D and 3D shapes are developed to look at circles, surface area and volume of prisms and nets of 3D shapes. Expanding and factorising expressions and more complex constructions are considered. Previous number work is then reviewed and extended to look at calculations with fractions, decimals and standard form and also to introduce bounds. Percentages are used in context such as wages, currency and reverse percentages. Students will then look at angles in polygons before Pythagoras' theorem is then introduced. There is a review of ratio linked to best buy and then transformations are reviewed and extended further. Probability is linked to tree and Venn diagrams and then compound units considered and linked to graphs before more complex graphs are introduced. Finally trigonometry is explored before final preparation for GCSE maths begins with a review of any areas which require consolidation.

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
<b>Topic</b>	-Equations -Straight Line Graphs -2D and 3D Shapes	- Expanding and Factorising -Constructions -Number -Using Percentages	-Angles -Pythagoras' Theorem -Ratio and Proportion	-Transformations, Similarity and Congruence -Probability	-Rates	-Graphs of Functions -Trigonometry -GCSE Preparation
<b>Core Knowledge/ Threshold Concept</b>	Understand, reason, and solve problems involving:  -Solve equations and inequalities, representing inequalities, substitution, rearranging formulae	Understand, reason, and solve problems involving:  -Expanding one or more brackets and factorising expressions  -Constructing triangles, bisectors of lines and angles and a perpendicular to and from a line	Understand, reason, and solve problems involving:  -Angles in parallel lines and polygons  -Understanding and using Pythagoras' theorem	Understand, reason, and solve problems involving:  -Identify congruent shapes, perform and describe different transformations, link enlargements to similar shapes  -Linking probability to relative frequency and	Understand, reason, and solve problems involving:  -Speed, density and other rates of change, distance-time graphs	Understand, reason, and solve problems involving:  -Non-linear graphs, representing inequalities visually  -Introduction to trigonometry  -Review of years 7-9

	<p>-Plotting linear graphs, interpreting gradients and y-intercepts</p> <p>-Area and perimeter of 2D shapes including circles, volume and surface area of prisms including cylinders, nets, plans and elevations</p>	<p>-Review of calculations with fractions, mixed numbers and decimals, converting and calculations with standard form, bounds and error intervals</p> <p>-Review of percentage multipliers, interest, financial problems, exchange rates and reverse percentages</p>	<p>-Review of ratio, best value and proportion problems</p>	<p>expected outcomes, using tree diagrams and Venn diagrams to find probabilities</p>		
<b>Why this learning now?</b>	<p>The units link to:</p> <p>Equations: Year 9 – Straight line graphs, Expanding and factorising, Graphs of functions Year 10 – Representing solutions of equations and inequalities, Expanding and factorising, Changing the subject Year 11 – Types of number and sequences, Gradients and Lines, Manipulating expressions, Simultaneous equations, Non-linear graphs, Functions</p>	<p>The units link to:</p> <p>Expanding and Factorising: Year 9 - Graphs of functions Year 10 – Representing solutions of equations and inequalities, Expanding and factorising, Changing the subject Year 11 – Types of number and sequences, Gradients and Lines, Manipulating expressions, Simultaneous equations, Non-linear graphs, Functions</p>	<p>The units link to;</p> <p>Angles: Year 9 – Trigonometry Year 10 – Trigonometry Year 11 – Loci, Trigonometry 2 Year 11 – Vectors</p> <p>Pythagoras’ Theorem: Year 10 – Working with circles, Congruence and similarity</p> <p>Ratio and Proportion: Year 9 – Ratio and proportion, Rates Year 10 – Non calculator methods, Indices and roots, Percentages and</p>	<p>The units link to:</p> <p>Transformations, Similarity and Congruence: Year 10 – Transformations Year 11 - Vectors</p> <p>Probability: Year 10 – Probability</p>	<p>The units link to:</p> <p>Rates: Year 10 – Non calculator methods, Indices and roots, Percentages and interest, Ratio and fractions Year 11 – Multiplicative, Types of number and sequences, Using graphs</p>	<p>The units link to:</p> <p>Graphs of Functions: Year 10 – Representing solutions of equations and inequalities, Expanding and factorising, Changing the subject Year 11 – Types of number and sequences, Gradients and Lines, Manipulating expressions, Simultaneous equations, Non-linear graphs, Functions</p> <p>Trigonometry:</p>

	<p>Straight Line Graphs: Year 9 - Expanding and factorising, Graphs of functions Year 10 – Representing solutions of equations and inequalities, Expanding and factorising, Changing the subject Year 11 – Types of number and sequences, Gradients and Lines, Manipulating expressions, Simultaneous equations, Non-linear graphs, Functions</p> <p>2D and 3D Shapes; Year 9 – Pythagoras’ theorem Year 10 – Working with circles, Congruence and similarity</p>	<p>Constructions: Year 9 – Angles, Trigonometry Year 10 – Angles and Bearings, Trigonometry Year 11 – Loci, Trigonometry 2 Year 11 – Vectors</p> <p>Number: Year 9 – Using percentages, Ratio and proportion, Rates Year 10 – Non calculator methods, Indices and roots, Percentages and interest, Ratio and fractions Year 11 – Multiplicative, Types of number and sequences, Using graphs</p> <p>Using Percentages: Year 9 – Ratio and proportion, Rates Year 10 – Non calculator methods, Indices and roots, Percentages and interest, Ratio and fractions</p>	<p>interest, Ratio and fractions Year 11 – Multiplicative, Types of number and sequences, Using graphs</p>			<p>Year 10 – Angles and Bearings, Trigonometry Year 11 – Loci, Trigonometry 2</p>
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		Year 11 – Multiplicative, Types of number and sequences, Using graphs				
<b>Assessment Opportunities:</b>	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: -Equations -Straight line graphs -2D and 3D Shape  These are completed in every unit and marked with personalised feedback.	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: -Expanding and Factorising -Constructions -Number -Using Percentages  These are completed in every unit and marked with personalised feedback.  Two 45-minute assessments (one non calculator and one calculator) on all topics covered so far.	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: - Angles -Pythagoras’ Theorem -Ratio and Proportion  These are completed in every unit and marked with personalised feedback.	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: - Transformations, Similarity and Congruence -Probability  These are completed in every unit and marked with personalised feedback.  Two 90-minute assessments (one non calculator and one calculator) on all topics covered so far.	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: -Rates  These are completed in every unit and marked with personalised feedback.	Regular formative assessment in lessons including questioning, recall activities and self / peer assessment.  Topic WINs for: - Graphs of Functions - Trigonometry  These are completed in every unit and marked with personalised feedback.
<b>Learning at Home</b>	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and	Homework is set every week, consisting of a one hour, Sparx online homework. This will include consolidation of current work and

	recall of previous knowledge.	recall of previous knowledge.  Pupils are also set revision to complete online before assessments.	recall of previous knowledge.	recall of previous knowledge.  Pupils are also set revision to complete online before assessments.	recall of previous knowledge.	recall of previous knowledge.
<b>Key Vocabulary</b>	Formula Y-intercept	Perpendicular Interest	Polygon Hypotenuse	Scale factor	Density	
<b>Spiritual, Moral, Social and Cultural concepts covered</b>	<p>To study maths is to train oneself in the art of reason, assembling the facts before making logical deductions – maths removes any prejudice. By its very nature, maths knows no borders, knows no race, religion or gender and knows no social background</p> <p><b>Spiritual development examples include:</b></p> <ul style="list-style-type: none"> <li>-Sense of enjoyment and fascination in learning</li> <li>-Use of imagination and creativity in their learning</li> <li>-Willingness to reflect on their experiences</li> <li>-The awe and wonder of mathematics such as symmetry in nature and number sequences such as the Fibonacci sequence</li> </ul> <p><b>Moral development examples include:</b></p> <ul style="list-style-type: none"> <li>-The use of statistics and how people manipulate them to promote their own (biased) opinions and to discuss the use and misuse of data in all issues including those supporting moral argument.</li> <li>-How to word questionnaires so as not to embarrass people</li> </ul> <p><b>Social development examples include:</b></p> <ul style="list-style-type: none"> <li>-Use of a range of social skills in different contexts such as a willingness to participate and to work collaboratively</li> <li>-How the census is used by governments to plan ahead for health, education and social requirements</li> </ul> <p><b>Cultural development examples include:</b></p> <ul style="list-style-type: none"> <li>-Appreciating the wealth of mathematics in all cultures throughout history.</li> <li>-How the Mathematical language is a universal language used worldwide</li> </ul>					
<b>Links to careers and</b>	<p>Maths is used in daily life and is therefore a vital skill for everyone. Mathematical skills used on a regular basis including:</p> <ul style="list-style-type: none"> <li>-percentages</li> <li>-fractions</li> </ul>					

**the world of work**

- time
- best value
- financial awareness
- ratios
- interpreting information
- measurements
- currency conversions

Transferable life skills include:

- resilience
- mathematical writing
- number sense working systematically
- independent thinking to solve problems
- logical reasoning

Possible career links include:

- Accountancy
- Banking
- Self Employed Business
- Architecture
- Engineering
- Graphic Design