KS3 Curriculum Overview: Maths

Year 9 Curriculum Overview

	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Unit of Work	• Algebraic notation • Sequences (nth term) • Graphs (linear and quadratic) • Properties of number	• Rounding, Estimation and bounds • Solving equations • Averages	• Directed Numbers • Standard Form • Fractions	• Ratio • Angles • Percentages	• Charts and graphs • Measures and Compound units • Similar shapes	• Pythagoras and Trigonometry • Area and Volume • Surface area, plans and elevations
Ethos Links	**STEM** – Use of algebra throughout many different programming areas **Milton Keynes** – link to MK business and their use of algebra	**STEM** - Estimation and bounds link to real life scenarios through engineering **Milton Keynes** – link to MK business through averages	**STEM** – Standard form applications in real life	**STEM**- Use of percentages in real life **Milton Keynes** – link to MK business	**STEM** – Drawings and scales – how similar shapes are used – link to careers **Sustainability** – charts and graphs linked to several different environmental factors **Milton Keynes** – charts and graphs linked to the growth of Milton Keynes	**Sustainability** – volume considerations of packaging and other things and how to be sustainable

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Knowledge By the end of this unit students will know and understand:	*Algebraic Notation* How to factorise single brackets • How to expand products of two or more binomials *Sequences* • How to recognise geometric sequences • How to use and find the nth term with sequences *Graphs (linear and quadratic)* • How to plot graphs in the form y=mx+c • How to identify the gradient and y-intercept of a linear graph • How to plot a linear graph • How to plot a quadratic graph given a table of values	*Rounding, Estimation and Bounds* • How to use approximation through rounding to significant figures to estimate answers • Limits of accuracy and begin to identify upper and lower bounds *Solving Equations* • How to solve multi-step equations • How to solve one and two step inequalities • How to solve equations with unknowns on both sides *Averages* • How to calculate averages from a table of values	*Directed Numbers* • How to solve problems with directed numbers *Fractions* • How to multiply and divide mixed numbers • How to solve problems with mixed numbers *Standard form* • How to write numbers in standard form • How to convert numbers from standard form • Add and subtract with numbers in standard form • Use index laws to multiply and divide numbers in standard form	*Ratio and Proportion* • How to write and simplify ratios in the form 1:n • How to solve proportional problems • How to solve reverse ratio questions *Angles* • How to derive and use the sum of angles in a triangle and use it to deduce the angle sum in any polygon *Percentage problems including interest* • The difference between compound and simple interest • How to calculate decimal percentages using a multiplier	*Compound Units and Measures* • How to use graphs to interpret compound units • How to convert and calculate compound units such as speed, unit pricing and density to solve problems *Similar shapes* • How to identify similar shapes • How to calculate scale factors between similar shapes • How to calculate missing lengths using scale factors *Charts and graphs (including scatter graphs)*	*Pythagoras and Trigonometry* • Pythagoras' Theorem and how to solve problems involving right angled triangles. • How to calculate missing lengths and angles in triangles using trigonometry. *Area and volume* • How to calculate the area and circumference of a circle using exact values • How to form equations to calculate the area and perimeter of shapes • How to solve volume problems by using the inverse • How to calculate the volume of a cylinder using exact values *Plans and Elevations and surface area* • How to construct views of 3D

	Properties of number • How to use Venn diagrams to calculate Highest Common Factor and Lowest Common Multiple	• How to make comparisons between averages and spread			• How to identify outliers • How to use scatter graphs to predict trends and patterns • How to construct and interpret a frequency polygon • How to interpret a histogram	shapes including front, plan and side views • How to calculate surface area of prisms • Draw the net of any 3D shape

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Skills By the end of this unit students will be able to:	• Use common factors to factorise brackets • Multiply two expressions when expanding double brackets • Apply and use multiple representations within algebra • Calculate the nth term of a sequence • Identify gradients and y-intercepts • Substitute into a table of values Draw a Venn diagram and input values • Plot linear and quadratic graphs • Use real life graphs to interpret situations • Substitute into formulas Learning habits • Noticing • Make links and applying • Communicating • Explain, reason, generalise • Resilience • Listening • Creating, imagining, and innovating	• Estimate to 1 significant figure • Calculate averages from a table of values using multiplication, division and addition • Make comparisons between averages • Apply the inverse to solve equations and inequalities Learning habits • Learn from mistakes • Resilience • Reasoning - justify, explain, and reason both orally and written • Communicating • Collecting and using data • Questioning • Thinking • Analysis and evaluation	• Apply multiplication and division to mixed numbers • Convert numbers to and from standard form Learning habits • Risk taking • Imagining • Noticing • Thinking • Questioning • Making links and applying knowledge • Reasoning and making judgements • Problem solving • Communicating • Creating and imagining	• Make comparisons between parts and wholes of a ratio model • Effectively use their calculator • Use a multiplier to increase or decrease by a percentage • Substitute into a formula to find the missing angles in polygons • Solve problems with ratios Learning habits • Communication • Create, imagine, innovate • Problem solving • Explain and reason • Making links and applying knowledge • Noticing	• Draw and use a line of best fit • Break up polygons into triangles • Substitute into formulae • Apply multiplication and division with scale factors Learning habits • Making links and applying knowledge • Reasoning and making judgement • Communicating • Noticing • Problem solving • Resilience	• Use formulas to calculate missing lengths of triangles • Effective use of calculators with trigonometry • Apply area calculations to surface area • Draw 3D shapes on isometric paper Learning habits • Creating, imagining, and innovating • Perseverance • Noticing • Concentrating • Risk taking • Reasoning and making judgements • Analysis and evaluation

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Key Vocabulary	Factorise Quadratic Coefficient Nth term Gradient Intercept	Bounds Estimate Limits Inequality Inverse Subject	Part Whole Simplify Standard form Decimal Powers of 10 Index Base	Multiplier Exact Interest Compound interest Simple interest Polygon Exterior Interior Multiplier	Scale factor Similar Mass Density Volume Speed Distance Time Line of best fit Correlation	Opposite Adjacent Hypotenuse Square Square root
Assessment	Questioning Homework Algebraic notation – TA Sequences – SA Coordinates and graphs – SA Properties of number - SA	Questioning Homework Rounding estimation and bounds – TA Solving equations – SA Averages - SA	Questioning Homework Directed numbers – SA Standard form – TA Calculations using fractions – SA	Questioning Homework Ratio notation – TA Angles – TA Percentages – SA	Questioning Homework Charts and graphs – SA Measures and compound units – SA Similar shapes - SA	Questioning Homework Pythagoras and trigonometry – TA Area and volume – SA Surface area, plans and elevations – SA
Assessment	Formal assessments take place on 3 occasions throughout the year. These assess learning up to that point.					