QEMS

Academic outline 2024-25

		Mathematics				
	Term 1 Aug-Oct	Term 2 Nov-Dec	Term 3 Jan-Feb	Term 4 Mar-Apr	Term 5 Apr-May	Term 6 Jun-Jul
Year 7:	Sequences Algebraic Notation Equality and Equivalence Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Place Value and Ordering Numbers FDP equivalence Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Solving Problems with Addition/Subtraction Solving Problems with Multiplication/Division Fractions and Percentages of Amounts Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Operations and Equations with Directed Numbers Addition and Subtraction of Fractions Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Constructing, Measuring and Using Geometric Notation Developing Geometric Reasoning Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Developing Number Sense Sets and Probability Prime Numbers and Proof Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2
Year 8:	Ratio and Scale Multiplicative Change Multiplying and dividing fractions Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Working in the Cartesian plane Representing data Tables and probability Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Brackets, equations and inequalities Sequences Indices Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Fractions and Percentages Standard Index Form Number Sense Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Angles in parallel lines and polygons Area of trapezia and circles Line symmetry and reflection Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	The Data Handling Cycle Measures of Location Home Learning | White Rose Maths Oak Academy Link 1

Year 9:	Straight line graphs Forming and solving equations Testing Conjectures Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Three-dimensional shapes Constructions and Congruency Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Numbers Using percentages Maths and Money Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Deduction Rotation and Translation Pythagoras Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Enlargement and Similarity Solving ratio and proportion problems Rates Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Probability Algebraic representation Revision Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2
Year 10 : GCSE HIGHER	Representing solutions of equations & inequalities Simultaneous Equation Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Congruence, similarity & enlargement Trigonometry Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Angles and Bearings Working with circles Vectors Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Ratios & Fractions Percentages & Interest Probability Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Delving into data Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2	Non-calculator methods Types of Number and sequences Indices & Roots Home Learning | White Rose Maths Oak Academy link 1 Oak Academy link 2 Oak Academy link 3
Year 10: GCSE FOUNDATION	Decimals and Fractions Expressions and Formulae Linear Equations Oak Academy link 1 Oak Academy link 2	Approximations Ratio, Speed and Proportion Angles Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Perimeter and Area Transformations Linear Graphs Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Volumes and Surface Areas of Prisms & Curved Shapes and Pyramids Charts, Tables and Averages Oak Academy link 1 Oak Academy link 2	Number and Sequences Linear Inequalities Probability and Events Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Pythagoras' Theorem Measures and Scale Drawings Oak Academy link 1 Oak Academy link 2

		Oak Academy link 4				
Year 11: GCSE HIGHER	Graphs Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4 Oak Academy link 5	Algebra Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Reasoning Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Revision and Communication Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4	Revision	Exams
Year 11: GCSE FOUNDATION	Simultaneous Equations Percentages and Compound Measures Percentages and Variation Oak Academy link 1 Oak Academy link 2	Powers and Standard Form Quadratics Representation and Interpretation Oak Academy link 1 Oak Academy link 2 Oak Academy link 3	Non linear graphs Combined Events Constructions and Loci Congruence and Similarity Vectors Oak Academy link 1 Oak Academy link 2 Oak Academy link 3 Oak Academy link 4 Oak Academy link 5	Right angled triangles Revision Oak Academy link 1	Revision	Exams

Subject	Mathematics	Year group	8

Vision statement:	At Landau Forte our curriculum exists to ensure all students regardless of background and ability have the opportunity to unlock their potential. We are committed to students being challenged from their previous key stage learning experiences. Our broad and balanced curriculum is ambitious, coherently planned and sequenced, and will provide the platform for preparing students with the foundations for examination success. Our Curriculum Intent has been informed by a wide variety of researchers and is steeped in evidence based research. Christine Counsell summarises the aspiration of our curriculum to empower all learners creating a pathway to success in university, their career and life: *'A curriculum exists to change the pupil, to give the pupil new power. One acid test for a curriculum is whether it enables even lower attaining or disadvantaged pupils to clamber into the discourse and practices of educated people, so that they gain powers of the powerful.'* As well as excellent academic success we aim to ensure our students leave us as polite and well-rounded young adults. Our new core values of Compassion, Courage and Curiosity are currently being embedded throughout our curriculum offer to ensure we continue to meet our social, emotional, spiritual and moral obligations.
Curriculum intent:	All students acquire the mathematical life skills necessary for the world of work, no matter what their starting point is, catering for all abilities and backgrounds. We have a strong belief that all students can achieve in Maths. Students will be taught to have a firm understanding of number bonds and be confident in using non-calculator strategies for solving problems. Students will be stretched and challenged through problem solving tasks to develop resilience. Students are encouraged to show courage through attempting questions in environment where other students show compassion through a culture of being non-judgmental when questions are answered incorrectly. Students are also encouraged to show curiosity through asking questions and taking a genuine interest in the real life applications of the Maths that they are learning. This will be achieved by staff working together in planning lessons that allow ALL students to achieve/ exceed their potential through: Common lesson planning formats; Expert knowledge of the subject; Differentiated material; Regular use of AfL to assess progress in a lesson; Regular use of formal marking and feedback; Regular summative assessments to ensure appropriate progress and intervention.
Threshold Concepts (TCs):	TC1 Algebraic manipulation - This concept involves recognising mathematical properties and relationships using symbolic representation TC2 Number sense - This concept involves understanding the number system and how they are used in a wide variety of mathematical ways TC3 Shape facts - This concept involves recognising the names and properties of geometry shapes and angles. TC4 Multiplicative reasoning - This concept involves using ratio and proportion and understanding of reciprocals in real world applications TC5 Representing and interpreting data - This concept involves interpreting, manipulating and presenting data in various ways. TC6 Calculator skills - This concept involves fluent application of mathematical operations on a scientific calculator TC7 Understanding and calculating risk - This concept involves knowing the rules of probability in the correct context

KS2 National Curriculum summary:	The curriculum ensures that all pupils around England get the essential knowledge they need to become educated citizens. So, it doesn't matter which school or area children are studying at - they will develop the same fundamental maths skills. Included in this frame of work are curriculum aims, which pupils need to meet at the end of each school year. Children who want to expand their knowledge even further will get the opportunity to do so. But essentially, they will all start from basics by learning about the key topic areas covered in the national curriculum for KS2 maths.
	The eight main maths areas, which are included in the national curriculum for maths throughout KS2 are:
	• Number - Number and Place Value
	• Number - Addition and Subtraction
	• Number - Multiplication and Division
	• Number - Fractions
	• Measurement
	• Geometry - Properties of Shape
	• Geometry - Position and Direction (not included in year 3)
	• Statistics
	As pupils get to year 6, they would have developed a deep understanding of these maths concepts. That's why two additional topic areas are introduced to the curriculum, which are:
	• Ratio and Proportion
	• Year 6 Algebra
Learner skills:	Critical thinking Organisation Collaboration Adaptability Oracy Self-quizzing

	CRITICAL THINKING	ORGANISATION	COLLABORATION	ADAPTABILITY	ORACY	SELF QUIZZING
	Term 1 Aug-Oct	Term 2 Nov-Dec	Term 3 Jan-Feb	Term 4 Mar-Apr	Term 5 Apr-May	Term 6 Jun-Jul
The Big Question	Why maths?					
Big picture questions:	What is the link between ratios and Fractions?	How can tables help us with probabilities?	What are inequalities?	How do we write down the distance to the sun?	What is Pi?	How do we handle data?
Content (Linked to TCs):	TC2 - Number sense TC6 - Calculator skills • Understanding the meaning and representation of ratio • Understand and use ratio notation • Solve problems involving ratios of the form 1:n or n:1 • Solve proportional problems involving the ratio m:n • Divide a value into a given ratio • Express ratios in their simplest integer form • H - Express ratios in the form 1:n • Compare ratios and related fractions	TC4 - Multiplicative reasoning TC5 - Representing and interpreting data • Work with coordinates in all four quadrants • Identify and draw lines that are parallel to the axes • Recognise and use the line y=x • Recognise and use lines of the form y=kx • Link y=kx to direct proportion problems • H - Explore the gradient of the line y=kx • Recognise and use lines of the form y=x+a	TC1 - Algebraic manipulation • Form algebraic expressions • Use directed number with algebra • Multiply out a single bracket • Factorise into a single bracket • Expand multiple single brackets and simplify • H - Expand a pair of binomials • Solve equations, including with brackets • Form and solve equations with brackets	TC2 - Number sense TC6 - Calculator skills • Convert between decimals and percentages more than 1/100% • Percentage decrease with a multiplier • Calculate percentage increase and decrease using a multiplier • Express one number as a fraction or a percentage of another without a calculator • Express one number as a fraction or a percentage of another using calculator methods • Work with percentage change	TC3 - Shape facts • REVIEW STEP - Understand basic angle rules and notation • Investigate angles between parallel lines and the transversal • Identify and calculate with alternate and corresponding angles • Identify and calculate with co-interior, alternate and corresponding angles • Solve complex problems with parallel line angles	TC5 - Representing and interpreting data TC6 - Calculator skills • Set up a statistical enquiry • Design and criticise questionnaires • Draw and interpret multiple bar charts • Draw and interpret pie charts • Draw and interpret line graphs • Choose the most appropriate diagram for a given set of data • Represent and interpret grouped quantitative data • Find and interpret the range

• Understand pi as the ratio between diameter and circumference • H - Understand gradient of a line as a ratio • Solve problems involving direct proportion • Explore conversion graphs • Convert between currencies • H - Explore direct proportion graphs • Explore relationships between similar shapes • Understand scale factors as multiplicative relationships • Draw and interpret scale diagrams • Interpret maps using scale factors and ratio • Represent multiplication of fractions • Multiply a fraction by an integer • Find the product of a pair of unit fractions	• Explore graphs with negative gradients (y=-kx, y=a-x, x+y=a) • Link graphs to linear sequences • Plot graphs of the form y=mx+c • H - Explore non-linear graphs • H - Find the midpoint of a line segment • Draw and interpret scatter graphs • Understand and describe linear correlation • Draw and use line of best fit (1) • Draw and use line of best fit (2) • Identify non-linear relationships • Identify different types of data • Read and interpret ungrouped frequency tables • Read and interpret grouped frequency tables • Represent grouped discrete data • Represent continuous data grouped into equal classes	• Understand and solve simple inequalities • Form and solve inequalities • H - Solve equations and inequalities with unknowns on both sides • H - Form and solve equations and inequalities with unknowns on both sides • Identify and use formulae, expressions, identities and equations • Generate sequences given a rule in words • Generate sequences given a simple algebraic rule • Generate sequences given a complex algebraic rule • H - Find the rule for the nth term of a linear sequence • Adding and subtracting expressions with indices • Simplifying algebraic	• Choose appropriate methods to solve percentage problems • H - Find the original amount given the percentage less than 100% • H - Find the original amount given the percentage more than 100% • H - Choose appropriate methods to solve complex percentage problems • Work with numbers greater than 1 in standard form • Investigate negative powers of 10 • Work with numbers between 0 and 1 in standard form • Compare and order numbers in standard form • Mentally calculate with numbers in standard form • Add and subtract numbers in standard form • Multiply and divide numbers in standard form • Use a calculator to work with numbers in standard form	• Construct triangles and special quadrilaterals • Identify and calculate with sides and angles in special quadrilaterals. • H - Understand and use the properties of diagonals of quadrilaterals • Understand and use the sum of exterior angles of any polygon • Understand and use the sum of interior angles of any polygon • Calculate missing interior angles in regular polygons • H - Prove simple geometric facts • H - Construct an angle bisector • H - Construct a perpendicular bisector of a line segment • Calculate the area of a trapezium • Calculate the perimeter and area of compound shapes (1) • Calculate the circumference of a	• Compare distributions using charts • Identify misleading graphs • Understand and use the mean, median and mode • Choose the most appropriate average • H - Find the mean from an ungrouped frequency table • H - Find the mean from a grouped frequency table • Identify outliers • Compare distributions using averages and the range

- Find the product of a pair of any fractions - Divide an integer by a fraction - Divide a fraction by a unit fraction - Understand and use the reciprocal - Divide any pair of fractions - H - Multiply and divide improper and mixed fractions - H - Multiply and divide algebraic fractions	- Represent data in two-way tables - Construct sample spaces for 1 or more events - Find probabilities from sample space - Find probabilities from two-way tables - Find probabilities from Venn diagrams - H - Use the product rule for finding the total number of possible outcomes	- expressions by multiplying indices - Simplifying algebraic expressions by dividing indices - Using the addition law for indices - Using the addition and subtraction laws for indices - H - Exploring powers of powers	- H - Understand and use negative indices - H - Understand and use fractional indices - Round numbers to a number of decimal places - H - Understand and use error interval notation - Calculate with money - Convert metric units of weight and capacity - H - Convert metric units of area - H - Convert metric units of volume - Solve problems involving time and the calendar	- circle (this wasn't its own small step but added in) - Investigate the area of a circle - Calculate the area of a circle and parts of a circle without a calculator - Calculate the area of a circle and parts of a circle with a calculator - Calculate the perimeter and area of compound shapes (2) - Recognise line symmetry - Reflect a shape in a horizontal or vertical line 1 (shapes touching the line) - Reflect a shape in a horizontal or vertical line 2 (shapes not touching the line) - Reflect a shape in a diagonal line 1 (shapes touching the line) - Reflect a shape in a diagonal line 2 (shapes not touching the line)

Key vocabulary:	Ratio: a statement of how two numbers compare	Quadrant: four quarters of the coordinate plane.	Simplify: grouping and combining similar terms	Percent: parts per 100 – written using the % symbol.	Parallel: Straight lines that never meet	Hypothesis: an idea or question you want to test
	Equal Parts:: all parts in the same proportion, or a whole shared equally	Coordinate: a set of values that show an exact position.	Substitute: replace a variable with a numerical value	Decimal: a number in our base 10 number system. Numbers to the right of the decimal place are called decimals.	Angle: The figure formed by two straight lines meeting (measured in degrees)	Sampling: the group of things you want to use to check your hypothesis
	Proportion: a statement that links two ratios	Horizontal: a straight line from left to right (parallel to the x axis)	Equivalent: something of equal value	Fraction: a fraction represents how many parts of a whole value you have.	Transversal: A line that cuts across two or more other (normally parallel) lines	Primary Data: data you collect yourself
	Order: to place a number in a determined sequence	Vertical: a straight line from top to bottom (parallel to the y axis)	Coefficient: a number used to multiply a variable	Equivalent: of equal value.	Isosceles: Two equal size lines and equal size angles (in a triangle or trapezium)	Secondary Data: data you source from elsewhere e.g. the internet/ newspapers/ local statistics
	Part: a section of a whole	Origin: (0,0) on a graph. The point the two axes cross	Product: multiply terms	Reduce: to make smaller in value.		
	Equivalent: of equal value		Highest Common Factor (HCF): the biggest factor (or number that multiplies to give a term)	Growth: to increase/ to grow.	Polygon: A 2D shape made with straight lines Sum: Addition (total of all the interior angles added together)	Discrete Data: numerical data that can only take set values
	Factors: integers that multiply together to get the original value	Parallel: Lines that never meet		Integer: whole number, can be positive, negative or zero.		Continuous Data: numerical data that has an infinite number of values (often seen with height, distance, time)
	Scale: the comparison of something drawn to its actual size	Gradient: The steepness of a line	Inequality: an inequality compares who values showing if one is greater than, less than or equal to another	Invest: use money with the goal of it increasing in value over time (usually in a bank)	Regular polygon: All the sides have equal length; all the interior angles have equal size	Spread: the distance/ how spread out/ variation of data
	Proportion: a statement that links two ratios	Intercept: Where lines cross	Sequence: items or numbers put in a pre-decided order	Standard (index) Form: A system of writing very big or very small numbers	Congruent: The same	Average: a measure of central tendency – or the typical value of all the data together
	Variable: a part that the value can be changed	Variable: a quantity that may change within the context of the problem.	Term: a single number or variable		Area: Space inside a 2D object	
	Axes: horizontal and vertical lines that a graph is plotted around	Relationship: the link between two variables (items). E.g. Between sunny days and ice cream sales	Position: the place something is located	Commutative: an operation is commutative if changing the order does not change the result.	Perimeter: Length around the outside of a 2D object	Proportion: numerical relationship that compares two things.

Approximation: an estimate for a value Scale Factor: the multiple that increases/ decreases a shape in size Currency: the system of money used in a particular country Conversion: the process of changing one variable to another Scale: the comparison of something drawn to its actual size. Numerator : the number above the line on a fraction. The top number. Represents how many parts are taken Denominator: the number below the line on a fraction. The number represent the total number of parts.. Whole: a positive number including zero without any decimal or fractional parts. Commutative: an operation is commutative if changing	Correlation: the mathematical definition for the type of relationship.. Origin: where two axes meet on a graph. Line of best fit: a straight line on a graph that represents the data on a scatter graph. Outlier: a point that lies outside the trend of graph. Quantitative: numerical data Qualitative: descriptive information, colours, genders, names, emotions etc. Continuous: quantitative data that has an infinite number of possible values within its range. Discrete: quantitative or qualitative data that only takes certain values. Frequency: the number of times a particular data value occurs	Linear: the difference between terms increases or decreases (+ or -) by a constant value each time Non-linear: the difference between terms increases or decreases in different amounts, or by x or ÷ Difference: the gap between two terms Arithmetic: a sequence where the difference between the terms is constant Geometric: a sequence where each term is found by multiplying the previous one by a fixed non zero Number Base: The number that gets multiplied by a power Power: The exponent – or the number that tells you how many times to use the number in multiplication Exponent: The power – or the number that tells	Base: The number that gets multiplied by a power Power: The exponent – or the number that tells you how many times to use the number in multiplication Exponent: The power – or the number that tells you how many times to use the number in multiplication Indices: The power or the exponent. Negative: A value below zero. Significant: Place value of importance Round: Making a number simpler but keeping its value close to what it was. Decimal: Place holders after the decimal point. Overestimate: Rounding up – gives a solution higher than the actual value Underestimate: Rounding down – gives a solution lower than the actual value.	Pi (): The ratio of a circle's circumference to its diameter. Perpendicular: At an angle of 90° to a given surface Formula: A mathematical relationship/ rule given in symbols. E.g. b x h = area of rectangle/ square Infinity (∞): A number without a given ending (too great to count to the end of the number) – never ends Sector: A part of the circle enclosed by two radii and an arc. Mirror line: a line that passes through the center of a shape with a mirror image on either side of the line Line of symmetry: same definition as the mirror line Reflect: mapping of one object from one position to another of equal	Spread: the distance/ how spread out/ variation of data Average: a measure of central tendency – or the typical value of all the data together Total: all the data added together Frequency: the number of times the data values occur Represent: something that show's the value of another Outlier: a value that stands apart from the data set Consistent: a set of data that is similar and doesn't change very much

	the order does not change the result. Unit Fraction: a fraction where the numerator is one and denominator a positive integer. Non-unit Fraction: a fraction where the numerator is larger than one. Dividend: the amount you want to divide up. Divisor: the number that divides another number. Quotient: the answer after we divide one number by another. e.g. dividend÷ divisor = quotient Reciprocal: a pair of numbers that multiply together to give 1	Outcomes: the result of an event that depends on probability. Probability: the chance that something will happen. Set: a collection of objects. Chance: the likelihood of a particular outcome. Event: the outcome of a probability – a set of possible outcomes. Biased: a built in error that makes all values wrong by a certain amount. Union: Notation 'U' meaning the set made by comparing the elements of two sets	you how many times to use the number in multiplication Indices: The power or the exponent. Coefficient: The number used to multiply a variable Simplify: To reduce a power to its lowest term Product: Multiply	Metric: A system of measurement. Balance: The amount of money in a bank account Deposit: Putting money into a bank account	distance from a given line. Vertex: a point where two or more-line segments meet. Perpendicular: lines that cross at 90° Horizontal: a straight line from left to right (parallel to the x axis) Vertical: a straight line from top to bottom (parallel to the y axis)	
Assessment:	KLT 1	KAT 1	KLT 3	KLT 4		KAT 2
Key/Historical misconceptions in this unit:	• Ratio is the number items. • When writing a ratio as fraction, not using whole as denominator.	• Confusing x and y. • Axes must start at zero and continue in equal intervals.	• Multiplying index when multiplying powers or multiplying base.	• Finding percentage of an amount instead of increase/decrease. • Not giving answers in correct standard form.	• Confusing angle rules in parallel lines. • Not using correct measurement	• Using first and last data elements to calculate range. • Confusing averages

					for nonstandard trapezia. • Confusing axes, line equations etc.	(mean, median, mode) • Giving frequency instead of data item when finding the mode.
	• Always dividing by total number of parts. • Multiplying an integer by a fraction, multiplying both denominator and numerator.	• Always using the overall total to calculate probability.	• Negative coefficients when expanding brackets.			
Sequencing:	We have chosen to sequence the year 8 curriculum like this because builds on their previous knowledge and begin to put in place the foundations to build upon in future years. For example - In year 7 they started with sequences which consolidated work previously done in primary school and formalised their understanding (Recognise linear and non-linear sequences) which was then extended by using algebraic notation (Generate sequences from an algebraic rule) in the following block. Algebra and sequences are then revisited in year 8 during the spring term (Revise and extend Y7 coverage to include more complex rules) to further extend and embed understanding. This then will move towards working with conjectures in year 9 (Testing conjectures about sequences) and finding the nth term of a linear sequence.					
Values	This scheme of work promotes the school values of Compassion, Curiosity and Courage by: Compassion - Students show compassion through a culture of being non-judgmental when questions are answered incorrectly. Curiosity - Students are encouraged to show curiosity through asking questions and taking a genuine interest in the real life applications of the Maths that they are learning. Courage - Students are encouraged to show courage through attempting questions					
National Curriculum plus:	In addition to teaching the statutory elements of the national curriculum, we also include opportunities to extend their learning beyond the classroom. For example practical examples and going further than the curriculum in terms of what they are expected to know from a financial literacy perspective.					