CURIOSITY COMPASSION COURAGE

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

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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

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Curriculum overview

Subject	Mathematics	Year group	10H
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

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The Big Question						
Big picture questions:	How can you use algebra to model problems? How can you use simultaneous equations to solve problems?	What happens to shapes when they are enlarged? What is special about triangles?	How do you know what direction you are traveling in? What are the properties of circles? How is distance and direction described in maths?	How are ratios used to show comparisons? How do you solve problems using percentages? How can you model the probability of multiple events?	How can you collect, represent and interpret data?	How can you calculate without a calculator? What different types of numbers are there and how are they related? How do you manipulate powers? How do you manipulate complex algebraic equations?
Content (Linked to TCs):	TC1 – Algebraic manipulation • Understand the meaning of a solution • Review - Form and solve one-step and two-step equations • Review - Form and solve one-step and two-step inequalities • Show solutions to inequalities on a number line • Interpret representations on number lines as inequalities • H - Represent solutions to	• TC3 - Shape Facts • TC6 – Calculator Skills • Review - Enlarge a shape by a positive integer scale factor • Review - Enlarge a shape by a fractional scale factor • H - Enlarge a shape by a negative scale factor • Identify similar shapes • Review - Work out missing sides and angles in a pair given similar shapes • Use parallel line rules to work out missing angles	TC2 – Number sense TC3 – Shape Facts • Review - Use cardinal directions and related angles • Review - Draw and interpret scale diagrams • Understand and represent bearings • Measure and read bearings • Make scale drawings using bearings • Calculate bearings using angles rules • Solve bearings problems using Pythagoras and trigonometry	TC4 - Multiplicative reasoning TC6 – Calculator skills • Review - Compare quantities using a ratio • Review - Link ratios and fractions • Review - Share in a ratio (given total or one part) • Use ratios and fractions to make comparisons • Review - Link ratios and graphs • Solve problems with currency conversion • Review - Link ratios and scales	TC5 - Representing and interpreting data TC6 - Calculator skills TC7 - Understanding and calculating risk • Understanding populations and samples • H - Construct a stratified sample • Primary and secondary data • Construct and interpret frequency tables and frequency polygons • Review - Construct and interpret two-way tables • Construct and interpret line and	TC1 - Algebraic manipulation TC2 - Number sense • Review - Mental/written methods of integer/decimal addition and subtraction • Review - Mental/written methods of integer/decimal multiplication and division • Review - The four rules of fraction arithmetic • Exact answers • H - Rational and irrational numbers

	inequalities using set notation • Review - Draw straight line graphs • Find solutions to equations using straight line graphs • H - Represent solutions to single inequalities on a graph • H - Represent solutions to multiple inequalities on a graph • Review - Form and solve equations with unknowns on both sides • Form and solve inequalities with unknowns on both sides • Form and solve more complex equations and inequalities • H - Solve quadratic equations by factorisation (F to cover in Y11) • H - Solve quadratic inequalities in one variable • Understand that equations can have more than one solution	• Establish a pair of triangles are similar • H - Explore areas of similar shapes • H - Explore volumes of similar shapes • H - Solve mixed problems involving similar shapes • Understand the difference between congruent triangles • H - Prove a pair of triangles are congruent • Explore ratio in similar right-angled triangles • Work fluently with the hypotenuse, opposite and adjacent sides • Use the tangent ratio to find missing side lengths • Use the sine and cosine ratio to find missing side lengths • Use sine, cosine and tangent to find missing angles • Review calculate sides in right-angled triangles using Pythagoras' Theorem • Select the appropriate method	• H - Solve bearings problems using the sine and cosine rules • Review - Recognise and label parts of circle • Calculate fractional parts of a circle • Calculate the length of an arc • Calculate the area of a sector • H - Circle Theorem: Angles at the centre & circumference • H - Circle Theorem: Angles in a semicircle • H - Circle Theorem: Angles in the same segment • H - Circle Theorem: Angles in cyclic quadrilateral • Understand and use the volume of a cylinder and cone • Understand and use the volume of a sphere • Understand and use the surface area of a sphere • Understand and use the surface area of a sphere • Review - H - Solve area and volume	• Use and interpret ratios of the form 1:n and n:1 • Solve 'best buy' problems • Combine a set of ratios • Link ratio and algebra • H - Ratio in area problems • H - Ratio in volume problems • Mixed ratio problems • Review - Convert and compare fractions, decimals and percentages • Review - Work out percentages of amounts (with and without a calculator) • Review - Increase and decrease by a given percentage • Review - Express one number as a percentage of another • Calculate simple and compound interest • Repeated percentage change • Review - Find the original value after a percentage change	bar charts (including composite bar charts) • Review - Construct and interpret pie charts • Criticise charts and graphs • H - Construct histograms • H - Interpret histograms • Review - Find and interpret averages from a list • Review - Find and interpret averages from a table • Review - Construct and interpret time series graphs • Construct and interpret stem-and-leaf diagrams • H - Construct and interpret cumulative frequency diagrams • H - Use cumulative frequency diagrams to find measures • H - Construct and interpret box plots • Compare distributions using charts and measures • H - Compare distributions using	(convert recurring decimals here) • H - Understand and use surds • H - Calculate with surds • Review - Rounding to decimal places and significant figures • Review - Estimating answers to calculations • Understand and use limits of accuracy • H - Upper and lower bounds • Use number sense • Solve financial maths problems • Break down and solve multi-step problems • Review - Understand the difference between factors and multiples • Review - Understand primes and express a number as a product of its prime factors • Review - Find the HCF and LCM of a set of numbers • Describe and continue arithmetic

	• Determine whether a given (x, y) is a solution to a pair of linear simultaneous equations • Solve a pair of linear simultaneous equations by substituting a known variable • Solve a pair of linear simultaneous equations by using graphs • Solve a pair of linear simultaneous equations by subtracting equations • Solve a pair of linear simultaneous equations by adding equations • Review - Use a given equation to derive related factors • Solve a pair of linear simultaneous equations by adjusting one equation • Solve a pair of linear simultaneous equations by adjusting both equations • Form a pair of linear simultaneous	to solve right-angled triangle problems • Work with key angles in right-angled triangles • H - Use trigonometry in 3-D shapes • H - Use the formula 1/2abSinC to find the area of a triangle • H - Understand and use the sine rule to find missing lengths • H - Understand and use the sine rule to find missing angles • H - Understand and use the cosine rule to find missing lengths • H - Understand and use the cosine rule to find missing angles • H - Choosing and using the sine and cosine rules •	problems involving similar shapes • Understand and represent vectors • Use and read vector notation • Draw and understand vectors multiplied by a scale • Draw and understand addition of vectors • Draw and understand addition and subtraction of vectors • H - Explore a vector journeys in shapes • H - Explore a quadrilaterals using vectors • H - Understand parallel vectors • H - Explore collinear points using vectors • H - Use vectors to construct geometric arguments and proofs	• Solve problems involving growth and decay • H - Understand iterative processes • Solve problems involving percentages, ratios and fractions • Review - Know how to add, subtract and multiply fractions • Review - Find probabilities using equally likely outcomes • Review - Use the property that probabilities sum to 1 • Using experimental data to estimate probabilities • Find probabilities from tables, Venn diagrams and frequency trees • Review - Construct and interpret sample spaces for more than one event • Calculate probability with independent events • Use tree diagrams for independent events	complex charts and measures • Review - Construct and interpret scatter graphs • Review - Draw and use a line of best fit • Understand extrapolation	and geometric sequences • Explore other sequences • H - Describe and continue sequences involving surds • Review - Find the rule for the nth term of a linear sequence • H - Find the rule for the nth term of quadratic sequence • Review - Square and cube numbers • Calculate higher powers and roots • Review - Powers of ten and standard form • Review - The addition and subtraction rules for indices • Understand and use the power zero and negative indices • Work with powers of powers • H - Understand and use fractional indices • Review - Calculate with numbers in standard form

	equations from given information • H - Determine whether a given (x, y) is a solution to both a linear and quadratic equation • H - Solve a pair of simultaneous equations (one linear, one quadratic) using graphs • H - Solve a pair of simultaneous equations (one linear, one quadratic) algebraically • H - Solve a pair of simultaneous equations involving a third unknown •			• User tree diagrams for dependent events • H - Construct and interpret conditional probabilities (Tree diagrams) • H - Construct and interpret conditional probabilities (Venn diagrams and two-way tables)		
Key vocabulary:	Inequalities, straight line graph, solve, equations, simultaneous equations	.Congruent, similarity, enlarge, scale factor, parallel lines, hypotenuse.	Angles, bearings, scale diagram, Pythagoras, trigonometry, cyclic quadrilateral, circumference, area, segment.	Ratio, scale, simplify, convert, simple interest, compound interest, percentage change, probability, venn diagram, frequency trees.	Population, sample, two-way tables, bar chart, line chart, pie chart, two-way table, histogram, stem and leaf diagram.	Sequences, indices, surds, bounds, rational, irrational.
Assessment:	KLT 1	PPE 1	KLT 3	KLT 4		PPE
Key/Historical misconceptions in this unit:	• Rearranging a quadratic, dividing	• Not recognising area scale factor and volume scale factor	• Bearings must be 3 digits and always from North	• Reverse percentage: Use of the original percentage to get	• A histogram is not a bar chart! No spaces between	• Not knowing their square numbers

	through by x to get a single solution • $(x+y)^2 = x^2+y^2$ • Incorrect use of inequality symbols /word confusion • Not recognising $x < 3$ is equivalent to $3 > x$ • Dividing/multiplying an inequality by a negative reverses the sign	as powers of linear scale factor • Use of negative scale factors • Similar shapes have the same angles, regardless of linear scale factor	• Failure to recognise rules of parallel lines can be applied to bearings • Reverse interpretation of column vectors (and even coordinates)	back to starting amount • Probabilities >1 • Use of ratios for probabilities • Knowing when to add and when to multiply probabilities • Compound Vs simple interest • Percentage change using original value	bars, area is frequency • Mean Vs median Vs 'average' • LoBF must go through origin • Plotting cumulative frequency for grouped continuous data against start of the group	making it difficult to simplify surds • $2^3 \neq 2 \times 3$ and $2^{-3} \neq -8$ • Recognise fractional indices are roots
Sequencing:	We have chosen to sequence the year 10 curriculum like this because builds on and extends their previous knowledge and understanding. Students are now working towards higher or foundation pathways. Students are now regularly completing past exam questions to begin to prepare them for the end of their GCSE. 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 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 moves towards working with conjectures in year 9 (Testing conjectures about sequences) and finding the nth term of a linear sequence. In year 10 students will revise and extend KS3 content, whilst higher students begin looking at sequences with surds and quadratic sequences in the summer term. In year 11 students consolidate and extend this knowledge to ensure they are fully prepared for their exams.					
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. Preparation of students to take Level 2 further maths in support of achieving additional qualifications, higher grades in their normal GCSE maths and in preparation for A-level maths: • Rationalisation of surds using difference of 2 squares • Domains and ranges of functions • Expanding triple brackets • Binomial expansion • Factor theorem • Advanced algebraic fractions • Sketching functions and interpreting graphs • Transformations of functions • Trig identities • Algebraic proof • Limiting values of sequences and expressions • Equations of circles not centred on the origin • Differentiation • Matrices • Matrix transformations • Geometric proof