Mathematics Curriculum Map

Intent

The mathematics curriculum aims to equip pupils with the knowledge and ability to apply their mathematics skills to a range of contexts by breaking tasks or problems down into a series of simpler steps and persevere in seeking solutions. In the mathematics department we foster an ethos of bravery, consistency, and challenge for all students.

Throughout our 5-year curriculum we place a real emphasis on stimulating prior knowledge to ensure a sound basis for new learning. We want students to understand the value of what they have learnt previously and realise its power in being successful with new learning.

As a department we understand the power of mathematics to open the door to further education and give students confidence in future life. We recognise the importance of milestone examination results but also the power of problem solving that mathematics can offer to students as they move on to the next stage of their lives. We have a fundamental belief that all pupils can achieve in mathematics and that this can be achieved through the process of intelligent practice, thoughtful lesson design and a well-designed curriculum.

Breadth & diversity: Students cover the full range of mathematical themes of concepts, revisiting most each academic year. This is complemented by an enrichment programme experienced once a term by lower year groups, and a range of internal and external mathematical competitions for all year groups.

Inclusive, Accessible, Aspirational, and Inspiring: We have a fundamental belief that all pupils can achieve in mathematics and that this can be achieved through the process of intelligent practice, thoughtful lesson design and a well-designed curriculum. Our aim is to keep avenues as wide as possible for as long as possible when working towards GCSE examinations. Our enrichment programme encourages students to consider mathematics in inspiring contexts including through the stock exchange, architecture, travelling the globe and in the world of sport.

Themes and concepts are used as strands that run through the curriculum: Themes that run throughout our curriculum are the structure of the number system, operating using number, multiplicative reasoning, sequences and graphs, statistics and probability, and geometry. Each of these are broken down into concepts that are then visited in a cyclical curriculum, reinvigorating, and building on student's skill set year on year.

Well-structured development of knowledge and skills: In Years 7 and 8 we use pictorial and concrete representations, moving towards more formal abstract methods in from Year 9 onwards. We have used White Rose Mathematics and Pearson Edexcel 9-1 schemes of work as the basis for our curriculum and are continually adapting and reflecting on these to ensure they fit the needs of our students year on year.

Mathematics staff:

Mr Joel Amps – Mathematics line manager, teacher of mathematics and science, associate headteacher.

Mrs Ailsa Harding – Mathematics subject lead

Mr Ashley Warnes – Teacher of mathematics and further mathematics

Mr James Treble – Teacher of mathematics and Head of Y9

Mrs Susan Howard – Teacher of mathematics

Mr Kristien Wood – Teacher of mathematics, Head of Y7, associate headteacher.

Mrs Vicky Amps – Mathematics HLTA and key skills maths support

Maths Implementation: Year 7

At the end of each unit, students will sit a 20-mark low stakes assessment to demonstrate their understanding. This may be completed in class or be sent home for homework. If students score less than 10 marks, they will be invited to attend a support session to help them fill the gaps in their learning.

Year 7 Scheme of work - White Rose Maths adapted for Lacon Childe School

		Week 1	Week2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn	Unit	Algebraic Thinking										Place Value & Proportion	
		Sequences			Directed number skills check	Understand and use algebraic notation			Equality and equivalence		Stock exchange enrichment	Place value, ordering integers and decimals	
	Unit content	Term to term sequence, position to term sequences,missing numbers in sequences, linear and non linear sequences, geometric sequences.			Adding, subtracting, multiplying & dividing positive	One & two step function machines, using numbers in calculations, substituting numbers into expressions			The meaning of equality, solving one step equations, like and unlike terms, simplifying expressions		Whole year group activity.	Write & order numbers up to 1 billion, compare numbes using inequalities, rounding using powers of 10, decimal places & significant figures, writing numbers in standard form	
Spring	Unit	Place Value and Proportion			Applications							Consolidate	
		Fraction, decimal and percentage equivalence			Solving problems with addition & subtraction		Solving problems with multiplication & division		Architecture enrichment	Fractions and percentages of amounts		Consolidation, enrichment, everyday maths	
	Unit content	Convert fractions, decimals and percentages, represent all on a number line, fractions, decimals and perentages above 1, use and interpret pie charts.			Solving problems with time, timetables, line graphs, perimeter, financial maths using mental and formal skills		Solving problems using area of triangles, rectangles, trapezia, parallelograms, finding the mean,		Whole year group activity.	Find a fraction of an amount, or an amount given a fraction of it, finding percentages of amounts using mental and formal		Time to focus on areas that need refreshing or extend those where possible. Working with recipts, bills, and time.	
Summer	Unit	Directed number					Lines and angles					Number sense	
		Operations and equations with directed number			Addition and subtraction of fractions		Constructing, measuring and using geometric notation		Exam revision	Exam week & oreinteerin		Developing geometric reasoning	
	Unit content	Calculate using negative numbers, solve two step equations, order directed numbers, use a calculator with negative numbers, evaluate expressions with directed numbers.			Equivalent fractions, mixed numbers & improper fractions, add & subtract fractions, algebraic fractions.		Letter & labelling conventions, constructing triangles & other polygons, draw & measure angles.		Preparation of year end assessments	Exam week and whole year group activity		Angles on a straight line, at a point, on parallel lines, in a triangle, in quadrilaterals and in polygons. Solve more compex problems with angle.	

Maths Implementation: Year 8

At the end of each unit, students will sit a 20-mark low stakes assessment to demonstrate their understanding. This may be completed in class or be sent home for homework. If students score less than 10 marks, they will be invited to attend a support session to help them fill the gaps in their learning.

Year 8 Scheme of work - White Rose Maths adapted for Lacon Childe School

		Week 1	Week2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 8	Week 9	Week 10	Week 11	Week 12
Autumn		Proportional reasoning									Representations		
	Unit	Prime numbers & proof (Y7)		Ratio & scale			Mulitplicative change		Mulitplying and dividing fractions		Working in the Cartesian Plane		
	Unit content	Multiples, factors, primes, square & triangular numbers, HCF, LCM, product of prime factors, venn diagrams.		Writing ratios, simplifying ratios, 1:n, dividing in a given ratio, solving problems, finding pi,calculating circumference, gradient.			Direct proportion, conversion graphs, exchange rates, recipes, scale drawings and maps, similar shapes.		Mutliplying and dividing fractions by integers, unit fractions and fractions.		Co-ordinates, axes, graphs parallel to the x and y axes, plotting graphs of the form y=x+a, y=ka, graphs with a positive and negative gradients.		
Spring		Representations						Algebraic techniques					
	Unit	Representing data			Tables & probability**		around the world enrichme	Brackets, inequalities & equations				Sequences	
	Unit content	Scatter graphs, lines of best fit, correlation, two way tables, grouped and ungrouped frequency tables, types of data.			Two way tables, sample space diagrams, venn diagrams and set notation, the product rule.		Whole year groups activity.	Forming expressions, directed number, expanding single brackets, factorising linear expressions, expand a pair of binomials, solving equations with brackets, form and solve inequalities.				Generate a sequence given a rule in words, in algebra, finding the nth term of a sequence.	
Summer		Algebraic tech.		Developing number									Dev. Geo
	Unit	Indices		Fractions & percentages			Exam revisio n	Exam week & orienteerin g	Average student / Arthog week	Standard form			Line symmetry & reflection
	Unit content	Adding & subtracting expressions with indices, multiplication, division and brackets laws of indices.		Calculate fractions & percentages using a calculator, find original amount given a percentage, percentage change, use of multipliers, express one number as a fraction or percentage of another.			Preparation of year end assessments	Exam week and whole year group activity	Practical applicatio n of measurem ent and averages	Positive & negative powers of ten, writing large and small numbers using standard form, add, subtract, mutliply and divide numbers in standard form, using a calculator with standard form.			Recognise line symmetry, reflect in vertical, horizontal & diagonal lines.

Maths implementation: Year 9

At the end of each unit, students will sit an end of unit assessment to demonstrate their understanding. This will be completed in class under exam conditions to get students used to working in this environment. If students achieve a score which indicates they are working two grades or more below their target pathway, they will be invited to attend a support session to help them fill the gaps in their learning.

Year	Term	Unit	Unit focus		Approx unit hours	Approx hours split across terms
Year 9	Aut 1 (25 hrs)	WRM 8(12)	Number sense	Rounding using decimal places and significant figures, estimation, calculating with metric measure, money, time, calendars, area and volume.	4	4
		WRM 8(14)	Area of trapezia & circles	Area of rectanges, parallelograms, triangles, trapezia, circles and circle parts and compound shapes.	8	8
		WRM 8(17)	Measures of location	Mean, median, mode and range, averages from ungrouped and grouped frequency tables, choosing the most appropriate average to use.	6	6
		Y9 1	Number	BIDMAS, Decimals, Place value, Factors & multiples, Squares, cubes & roots, Index notation, Prime factors	16	7
	Aut 2 (25 hrs)	Y9 1	Cornerstone 1: Number	BIDMAS, Decimals, Place value, Factors & multiples, Squares, cubes & roots, Index notation, Prime factors, standard form and surds.		9
		Y9 2	Cornerstone 2: Algebra	Algebraic expressions, Simplifying, Substitution, Formulae, Expanding, Factorising	14	14
	Spr 1 (25 hrs)	Y9 3	Cornerstone 3: Data	Frequency tables, 2-way tables, Representing data, Time series, Stem & leaf diagrams, Pie charts, Scatter graphs, Lines of best fit	12	12
		Y9 4	Cornerstone 4: Fractions & percentages	Operations with fractions, Multiplying & dividing, Fractions & decimals, Fractions & percentages, Calculating percentages	18	13
	Spr 2 (21 hrs)	Y9 4	Cornerstone 4: Fractions & percentages	Operations with fractions, Multiplying & dividing, Fractions & decimals, Fractions & percentages, Calculating percentages		5
		Y9 5	Cornerstone 5: Geometry	Properties of shapes, Angles in parallel lines, Angles in triangles, Exterior & interior angles, Geometrical Problems, pythagoras' theorem (H) and trigonometry (H)	16	16
	Sum 1 (18 hrs)	Y9 6	Equations, inequalities & sequences	Solving equations, solving with brackets, Inequalities, using formulae, Generating sequences, n^{th} term	14	14
		Y9 7	Perimeter, area & volume 1	Rectangles, parallelograms & triangles, Trapezia & changing units, Area of compound shapes, Surface area of 3D solids, Volume of prisms)	14	4
	Sum 2 (25 hrs)	Y9 7	Perimeter, area & volume 1	Rectangles, parallelograms & triangles, Trapezia & changing units, Area of compound shapes, Surface area of 3D solids, Volume of prisms)		10
		Y9 8	Graphs	Coordinates, Linear graphs, Gradient, y = mx + c, Real life graphs, Distance-time graphs, Quadratic and cubic graphs (H)	12	12

Maths implementation: Year 10

At the end of each unit, students will sit an end of unit assessment to demonstrate their understanding. This will be completed in class under exam conditions to get students used to working in this environment. If students achieve a score which indicates they are working two grades or more below their target pathway, they will be invited to attend a support session to help them fill the gaps in their learning.

Year	Term	Unit	Unit focus	Foundation content	Higher content	Approx unit hours	split across terms
Year 10		9	Transformations	Translation, Reflection, Rotation, Enlargement, describing enlargements, Combining transformations	3D solids, Reflection, rotation, enlargement, Combinations of transformations, Bearings & scale drawings, Constructions, Loci	12	12
	Aut 1 (25 hrs)	10	Probability	Calculating probability, Two events, Experimental probability, Venn diagrams, Tree diagrams	Combined events, mutually exclusive events, Experimental probability, independent events & tree diagrams, Conditional probability, Venn diagrams and set notation	15	15
		11	Ratio & proportion	Writing ratios, using ratios, Ratios, measures, Comparing using ratios, Using proportion, Proportion & graphs	Growth & decay, Compound measures, Ratio & proportion	15	5
	Aut 2 (25 hrs)	11	Ratio & proportion	Writing ratios, using ratios, Ratios, measures, Comparing using ratios, Using proportion, Proportion & graphs	Growth & decay, Compound measures, Ratio & proportion		10
		12	Right angled triangles	Pythagoras' theorem, Sine ratio, Cosine ratio, Tangent ratio, finding lengths & angles using trigonometry	Accuracy (bounds), Trigonometric graphs, Sine rule, Cosine rule, Area rule, 3D trig, Transforming trig graphs	18	18
	Spr 1 (25 hrs)	13	Averages & range	Mean & range, Mode, median & range, Types of average, Estimating the mean, Sampling	Sampling, Cumulative frequency, Box plots, Drawing & interpreting histograms, Describing populations	13	13
		14	Constructions, loci and bearings	3D solids, Plans & elevations, Accurate drawings, Scale drawings & maps, Constructions, Loci & regions, Bearings	3D solids, Plans & elevations, Accurate drawings, Scale drawings & maps, Constructions, Loci & regions, Bearings	15	10
	Spr 2 (21 hrs)	14	Constructions, loci and bearings	3D solids, Plans & elevations, Accurate drawings, Scale drawings & maps, Constructions, Loci & regions, Bearings	3D solids, Plans & elevations, Accurate drawings, Scale drawings & maps, Constructions, Loci & regions, Bearings		5
			Consolidation & Y10 assessment			8	8
		15	Quadratics equations and graphs	Expanding double brackets, plotting quadratic graphs, using quadratic graphs, Factorising quadratic expressions, Solving quadratic equations algebraically	Solving quadratic equations, Completing the square, solving simultaneous equations, solving linear and quadratic simultaneous equations, Solving linear inequalities	15	5
	Sum 1 (18 hrs)	15	Quadratics equations and graphs	Expanding double brackets, plotting quadratic graphs, using quadratic graphs, Factorising quadratic expressions, Solving quadratic equations algebraically	Solving quadratic equations, Completing the square, solving simultaneous equations, solving linear and quadratic simultaneous equations, Solving linear inequalities		10
		16	Multiplicative reasoning	Percentages, Growth & decay, Compound measures, Distance, speed & time, Direct & inverse proportion	Percentages, Growth & decay, Compound measures, Distance, speed & time, Direct & inverse proportion	15	8
	Sum 2 (25 hrs)	16	Multiplicative reasoning	Percentages, Growth & decay, Compound measures, Distance, speed & time, Direct & inverse proportion	Percentages, Growth & decay, Compound measures, Distance, speed & time, Direct & inverse proportion		7
		17	Perimeter, area and volume 2	Circumference of a circle, Area of a circle, Semicircles & sectors, Composite 2D shapes & cylinders, Pyramids & cones, Spheres & composite solids	Perimeter & area, Units & accuracy, Prisms, Circles, Sectors of circles, Cylinders & spheres, Pyramids & cones	18	18

Maths implementation: Year 11

At the end of each unit, students will sit an end of unit assessment to demonstrate their understanding. This will be completed in class under exam conditions to get students used to working in this environment. If students achieve a score which indicates they are working two grades or more below their target pathway, they will be invited to attend a support session to help them fill the gaps in their learning.

Year	Term	Unit	Unit focus	Foundation content	Unit focus	Higher content
Year 11	Aut 1 (25 hrs)	18	Fractions, indices and standard form	Multiplying & dividing fractions, Laws of indices, Standard form for large & small numbers, Calculating with standard form	Vectors	Vectors & vector notation, Vector arithmetic, Parallel vectors & collinear points, Solving geometric problems
		19	Congruence, similarity and vectors	Similarity & enlargement, Using similarity, Congruence, Vectors	Proportion & graphs	Direct proportion, Inverse proportion, Exponential functions, Non-linear graphs, translating graphs of functions, Reflecting & stretching graphs of functions
	Aut 2 (25 hrs)	19	Congruence, similarity and vectors	Similarity & enlargement, Using similarity, Congruence, Vectors	Consolidation time	
		20	Further algebra	Graphs of cubic and reciprocal functions, Non-linear graphs, Solving simultaneous equations graphically & algebraically, Rearranging formulae, Proof	Consolidation time	
	Spr 1 (25 hrs)		Mock examinations		Mock examinations	
			Revision & exam preparation		Revision & exam preparation	
	Spr 2 (21 hrs)		Revision & exam preparation		Revision & exam preparation	
	Sum 1 (18 hrs)		Revision & exam preparation		Revision & exam preparation	

Impact:

In Years 7 and 8 progress is measured through pathways (emerging, developing, secure and mastery) that make broad links to GCSE numerical grades. Year 9 is the transition year between pathways and GCSE numerical grade targets. In Years 10 and 11 progress is measured through regular end of unit assessment which use past GSCE exam questions and grade boundaries from 2019 to measure progress towards achieving target grades.

The outcomes of these measures will be used to inform teaching and revision, with the aim of supporting students' progress. Students will be encouraged to revise and supported in doing so as the course draws to a close.

Examination performance continues to be above national average and a pleasing number of students continue to study A level mathematics. The percentage of students achieving above grade 4 and grade 5 are above the national average. Every year we are particularly proud of students who regardless of starting point, show the resilience and determination to exceed their target grades through focused revision and a desire to succeed.