

Curriculum Rationale, Intent and Sequencing Maps

Curriculum Rationale: Mathematics

Our maths curriculum involves all pupils learning a body of knowledge relating to the skills and applications of maths. Maths is essential to everyday life, critical to science, technology, and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. As our pupils secure knowledge and gain skills and the ability to apply them, they will learn how maths can be used to solve problems, analyse data models and predict outcomes.

The maths curriculum at The Birley Academy is research-informed. We have carefully considered some of the very best maths curricula and then organised the key maths knowledge and skills in appropriately sequenced steps. This enables pupils to build their ability in maths systematically over time towards ambitious curriculum end points. Pupils' knowledge and skills are skilfully interwoven as they are gained over time through each of the topics from Years 7 to 11.

We aim to ensure that all our pupils who are disadvantaged or have any special educational needs and/or disabilities (SEND) have access to a carefully planned curriculum. Our curriculum aims to provide pupils with SEND with explicit systematic teaching and rehearsal of knowledge. We also ensure that these pupils have the time they need to study important subject content in maths.

Curriculum Intent: Mathematics

We believe that pupils deserve a creative and ambitious mathematics curriculum, rich in skills and knowledge, which ignites curiosity and prepares them well for everyday life and future employment. Our mathematics curriculum will give pupils the opportunity to:

- become **fluent** in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.
- can communicate, justify, argue and prove using mathematical vocabulary.
- develop their character, including resilience, confidence and independence, so that they contribute positively to the life of the school, their local community and the wider environment.

What we learn about in maths

In year 7 we learn about...

7		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7			
Autumn	E&E	Algebraic Thinking							Place Value and Proportion							Half Term	Christmas Holiday Project	Speedy Santa
		Sequences	Understanding and use algebraic notation			Equality and Equivalence			Place value and ordering integers and decimals			Fraction, decimal and percentage equivalence		Closing The Gap				
Spring	E&E	Applications of Number							Directed Number				Fractional Thinking			Half Term	Easter Holiday Project	How much does it
		Solving problems with addition and subtraction		Solving problems with multiplication and division			Fractions and Percentages of Amounts		Four operations with directed number			Addition and subtraction of fractions						
Summer	E&E	Lines and Angles							Reasoning with Number							Half Term	Summer Holiday Project	Y7 Maths Games
		Constructing, measuring and using geometric notation			Developing geometric reasoning				Developing number sense		Sets and probability		Prime numbers and proof		Closing The Gap			
		Hexagon	Triangle Construction		Four Pentagons			Lottery		Co-Primes								

In year 8 we learn about...

8		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7			
Autumn	E&E	Proportional Reasoning							Representations							Half Term	Christmas Holiday Project	Buried Messages
		Ratio and Scale	Multiplicative Change		Multiplying and Dividing Fractions		Closing The Gap	Working in the Cartesian Plane			Collecting and representing data		Tables and Probability	Closing The Gap				
Spring	E&E	Algebraic Techniques							Developing Number							Half Term	Easter Holiday Project	Bad Tomatoes
		Brackets, equations and inequalities		Sequences	Indices	Closing The Gap	Fractions and Percentages		Standard Index Form		Number Sense							
Summer	E&E	Developing Geometry							Reasoning with Data							Half Term	Summer Holiday Project	Y8 Maths Games
		Solving Equations Inquiry			Day Out				The sum of two equals the product		Egyptian Fractions							
		Angles in parallel lines and polygons		Area of trapezia and circles		Line symmetry and reflection			The Data Handling Cycle		Measures of Location		Closing The Gap					
		Fruit Pies			Royal Liver Clock				Youth Hostel			Averages						

In year 9 we learn about...

9		Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7			
Autumn	E&E	Reasoning with Algebra							Constructing in 2 and 3 dimensions							Half Term	Christmas Holiday Project	Fashion Entrepreneur
		Straight line graphs		Forming and Solving equations		Testing Conjectures		Closing The Gap	Three dimensional shapes			Constructions and Congruency			Closing The Gap			
Spring	E&E	Reasoning with Number							Reasoning with Geometry							Half Term	Easter Holiday Project	Dotty Problem
		Chocolate Box		Intersecting Lines		Working with Chemicals			Deduction		Rotation and Translation		Pythagoras' Theorem					
Summer	E&E	Reasoning with Proportion							Representations							Half Term	Summer Holiday Project	Crea8 Salon
		Calculations with Decimals			Pay and Pay Slips		Geoboard Squares		Probability		Algebraic Representation		Closing The Gap					
		Three of a Kind			Minimize or Supersize?				Summer Holiday			Hot Under the Collar						

Mathematics

In year 10 we learn about...

10	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7			
Autumn	Similarity							Developing Algebra							Half Term	Christmas Holiday Project	How much do we cost?
	Congruence, Similarity and Enlargement			Trigonometry		Closing The Gap		Representing Solutions to Equations and Inequalities			Simultaneous Equations			Closing The Gap			
E&E	Evaluating Statements			No-Fly Zones				Solving Equations Inquiry (F)			Simultaneous Staircase				Half Term	Easter Holiday Project	My Car
Spring	Geometry							Proportions and Proportional Change									
Spring	Angles and Bearings	Working with Circles		Vectors				Ratios and Fractions	Percentages and Interest		Probability			Half Term	Easter Holiday Project	My Car	
	Low Visibility			Sports Bag				Fraction Arrangement		Ice Cream							
Summer	Delving into Data							Using Number							Half Term	Summer Holiday Project	Paying for the Prom
Collecting, representing and interpreting data			Non-calculator methods				Types of number and sequences		Indices and Roots Mock Exams	Mock Exams	Work Experience						
E&E	Walking Talking Mark - OCR 2017 Summer Paper 1/4							Walking Talking Mark - OCR 2017 Summer Paper 2/5 (Before the Mocks)							Half Term	Summer Holiday Project	Paying for the Prom

In year 11 we learn about...

11	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7	Week 1	Week 2	Week 3	Week 4	Week 5	Week 6	Week 7			
Autumn	Graphs							Algebra							Half Term	Christmas Holiday Project	Full set of Exam Papers
	Gradients and lines	Non-linear graphs		Using graphs		Closing The Gap		Foundation - Revision Higher - Ex&F	Mock Exams		Expanding and Factorising		Changing the subject				
E&E	Walking Talking Mark - OCR 2017 Summer Paper 3/6							Exam Paper in class - Before mocks, not exam conditions - OCR 2017 November Paper 1/4							Half Term	Easter Holiday Project	Full set of Exam Papers
Spring	Reasoning							Revision and Communication									
Spring	Multiplicative reasoning	Geometric reasoning		Algebraic reasoning				Transformations and Constructions	Revision						Half Term	Easter Holiday Project	Full set of Exam Papers
	Exam Paper in class - Calculator							Exam Paper in class - Non calculator									
Summer	Revision							Exams							Half Term	Summer Holiday Project	Pre A Level work
Revision Folders							Revision Folders										

*Closing the Gap weeks are for using assessment data to ensure that knowledge gaps are closed before moving into the next half-term

*E&E are the Enrichment and Enhancement tasks to are used to develop problem solving skills using knowledge they have gained over that half term.



Mathematics

Maths Sequencing Map

Autumn

Year 7

- Sequences
- Understand and Use Algebraic Notation
- Equality and Equivalence
- Place Value & Ordering, Integers and decimals
- Fractions, decimals and percentages

Year 8

- Ratio and scale
- Multiplicative change
- Multiplying & Dividing fractions
- Number sense
- Working in the Cartesian plane
- Collecting & representing data
- Tables and Probability

Year 9

- Straight-line graphs
- Forming and solving equations
- Testing conjectures
- Three Dimensional shapes
- Constructions and congruency

Year 10

- Congruence, Similarity and Enlargement
- Trigonometry
- Probability
- Representing solutions of Equations and inequalities
- Simultaneous Equations

Year 11

- Gradients and Lines
- Non-linear graphs
- Using Graphs
- Expanding and factorising
- Changing the subject
- Functions

Spring

- Problem solving with addition and subtraction
- Problem solving with multiplication and division
- Fractions and Percentages of Amounts
- Operations and Equations with directed number
- Addition and subtraction of fractions

- Brackets, Equations and Inequalities
- Sequences
- Indices
- Fractions and Percentages
- Standard Index Form

- Numbers
- Using Percentages
- Maths and Money
- Deduction
- Rotation and Translations
- Pythagoras' Theorem

- Angles and bearings
- Working with circles
- Vectors
- Ratios and Fractions
- Percentages and Interest

- Multiplicative Reasoning
- Geometric Reasoning
- Algebraic Reasoning
- Transformations and constructions

Summer

- Constructing, measuring and using geometric notation
- Developing geometric reasoning
- Developing number sense
- Sets and probability
- Prime numbers and proof

- Angles in parallel lines and polygons
- Areas of trapezia and circles
- Line symmetry and reflection
- The data handling Cycle
- Measures of location

- Enlargement and Similarity
- Solving ratio and proportion problems
- Rates
- Probability
- Algebraic Representation

- Collecting, representing and interpreting data
- Non-calculator methods
- Types of number and sequences
- Indices and Roots
- Manipulating Expressions

- Revision and Exams