

Mathematics Curriculum Overview OLCC

Ethos

The Mathematics Department consists of a team of enthusiastic and committed teachers. We believe Mathematics is an exciting and challenging subject which continues to develop at a rapid rate across many research areas. Maths at Our Lady's will provide your child with the tools to understand science, engineering, technology, art and economics. We aim to inspire and motivate students to enjoy learning, achieve and develop as young mathematicians. Students will experience that mathematics is an international language and over time develop means of solving problems and enjoy maths for its own sake.

As a department, we provide an environment and curriculum for your child to become fluent in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, you child will develop a conceptual understanding and ability to recall and apply knowledge rapidly and accurately. We incorporate mathematical reasoning by encouraging your child to follow a line of enquiry, conjecture relationships, and generalisations and develop an argument, justification or proof using mathematical language. Through expert teaching and guidance, your child will be able to 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.

Sequencing

We have carefully mapped out our schemes of learning for every year group for the entire school year. Underpinning our schemes of learning is the application of spacing and interleaving, which we believe helps pupils to commit knowledge and skills into their long-term memories as well as strive for subject mastery.

Interleaving

Learning/knowledge acquisition is sequenced purposefully so that similar concepts are interspersed with different pieces of knowledge, rather than being consecutive. At Our Lady's Catholic College we believe this is the best way for learning to be embedded into long term memory. This method also improves pupils' abilities to apply many pieces knowledge to one task, which pupils usually find very difficult.

Spacing

Second method we use to help pupils commit knowledge and skills to memory is the spacing effect. This refers to incorporating time delays between learning and practise, leading to better educational performance over time. This means that pupils learn something new, then have more opportunities to re-visit that learning and practise it throughout the year. Pupils therefore do not have opportunities to forget, but also enhances fluency.



What is being studied at KS3?

Our Key Stage 3 Maths curriculum provides the foundation for students to study at GCSE level with increasing confidence and competence in addition to providing fundamental knowledge and transferable skills for success in everyday life. Our mathematics curriculum 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. Students will learn Number, Algebra, Geometry, Statistics, Probability, Ratio and Proportion and will develop good levels of competence in all disciplines, building on prior learning. The curriculum has been adapted, sequenced and differentiated to ensure students maximise their capabilities and are supported in retaining key knowledge and concepts alongside problem solving and application. Students will be challenged to exceed their potential and develop as resilient and independent learners. Through a combination of high quality teacher-led instruction, practical demonstrations, building conceptual understanding and highlighting common mathematical misconceptions, students will develop into reflective and passionate mathematicians. Assessment of mathematics will be via cumulative formal tests, end of unit formative assessments and common homework tasks.

What is being studied at KS4?

Our GCSE Maths syllabus prepares students for further study at A Level and provides fundamental knowledge and transferable skills for success in everyday life. At this stage, pupils should become more proficient in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They should reason mathematically by following a line of enquiry, conjecturing relationships and generalizations, and developing an argument, justifying their answers or being able to provide a mathematical proof using mathematical language and reasoning. Furthermore, they should 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.

The course is assessed through three mock examinations in Year 11 accumulating all the knowledge and skills students have developed.

After studying Mathematics at Our Lady's Catholic College:

Thanks to the growing importance placed on technology, big data and economic efficiency by all kinds of organizations, according to the US Bureau of Labour Statistics, between 2012 and 2022, the job market for mathematicians is expected to grow by a whopping 23%, with a predicted median salary of US \$110,000 (£87,660). Those who study maths are keen problem solvers, eager to make sense of even the most advanced equations. Academic research is a common career path, but so too are careers in business, economics and banking. This wide range of opportunities comes from the universal need for graduates with strong analytical and problem-solving skills.

KS3		Year 7 Curriculum Overview OLCC				
		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
TOPICS	Sequences	Equality and Equivalence	FDP Equivalence	Fractions and Percentages of Amounts	Construction and Measuring	Ratio and Scale
	Directed Numbers	Place Value	Prime Numbers and Proof	Fractions	Geometric Reasoning	Sets and Probability
	Understand and Use Algebraic Notation	FDP Equivalence	Solving Problems with Adding and Subtracting	Construction and Measuring	<i>Revision Y7 exam</i>	Consolidation

KS3		Year 8 Curriculum Overview OLCC				
		Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1
TOPICS	Multiplicative Change	Working in a Cartesian Plane	Tables and Probability	Indices	Angles	Data and Handling
	Fractions	Working in a Cartesian Plane	Brackets, Equations and Inequalities	FDP and %	3D Shapes	Data: Averages
	Working in a Cartesian Plane	Representing Data	Sequences	Working with Number	<i>Revision Y8 exam</i>	Consolidation

KS3	Year 9 Curriculum Overview OLCC					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
TOPICS	Straight Line Graphs	2D Shape	Types of Number and Standard Form	Using Percentages	Enlargements and Similarity	Data
	Forming and Solving Equations	3D Shape	Fractions	Angles	Solving Ratio and Proportion	Maths and Money
	Testing Conjectures	Construction and Congruency	Transformations	Right-Angled Triangles	Rates	Consolidation

KS4	Year 10 Curriculum Overview OLCC					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
TOPICS	Congruence, Similarity and Enlargement	Equations and Inequalities	Circle and Volume	Percentages and Interest	Probability	Indices and Roots
	Right-Angled Triangles	Simultaneous Equations	Vectors	Data	Number	Consolidation
	Equations and Inequalities	Angles and Bearings	Ratios and Fractions		Sequences	

KS4	Year 11 Higher Curriculum Overview OLCC					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	
TOPICS	Transformations and Constructions	Transformations and Constructions	Data	Circle Theorems	Consolidation	
	Equations and Inequalities	Equations and Inequalities	Equations and Graphs	More Algebra		
	Probability	Probability	Circle Theorems	Vectors and Geometric Proof	Exams	

KS4	Year 11 Foundation Curriculum Overview OLCC					
	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	
TOPICS	Transformations	Pythagoras and Proportion	Constructions, Loci and Bearings	Fractions, Indices and Standard Form	Consolidation	
	Graphs	Probability	Quadratic Equations and Graphs	Congruence, Similarity and Vectors		
	Ratio and Proportion	Multiplicative Reasoning	Perimeter, Area and Volume	More Algebra	Exams	

Ideas for days out with your child to support their learning in Maths:

- Winton Gallery at the Science Museum. Entry is free.
- Consider visiting the Faraday Museum at the Royal Institution. Entry is free.
- Bank of England Museum. Entry is free.
- Bletchley Park - the National Museum of Computing.
- Science Museum. Entry is free.
- Royal Observatory in Greenwich. Entry is free.
- British Museum - Maths challenge, financial education and money handling.
- V&A Museum - Maths and Islamic Design.
- Birmingham Science Museum and Planetarium.