Subject: Maths

ORMISTON ILKESTON ENTERPRISE ACADEMY

Curriculum Aims and Purpose

Our mathematics curriculum is well sequenced, in a way that enables the curriculum itself to be a progression model; it coheres classroom-to-classroom, teacher-to-teacher and year-to-year; it enables students at all levels of attainment to practise to fluency, to reason and to think mathematically at every possible opportunity. The OIEA Maths curriculum holds these principles at heart and aims to give students the best possible start for learning maths across Key Stages 3 and 4.

Our Maths curriculum prioritises critical knowledge and gradually builds understanding over time, interleaving concepts at every opportunity. It is underpinned by the principles of cognitive science and compliments the OIEA lesson structure.

Care and attention have been paid to what we know about learning mathematics from research as well as evidenced principles from cognitive science, such as interleaving and distributed practice. Tasks and activities are designed to subordinate previously learned content to new, incorporating prior learning into new wherever possible in order to improve retention and recall and the ability to connect knowledge across topics.

We teach beyond the specification requirements, to the wider domain, whilst also ensuring students are well prepared to be successful in GCSE examinations. We think hard about how learning in our lessons relates to current developments in the world and the context of our students, for example we teach binary and financial maths within KS3.

We ensure students gain a deeper understanding of the diverse range of careers available to those with mathematical knowledge and how to access these careers. We work closely with AMSP who provide our students with opportunities such as ‘A-Level Maths’ and ‘Further Maths’ taster sessions, as well as sessions focussed on ‘Girls Career’s in Maths’.

How our Curriculum inducts students into the discipline of the subject:

Our curriculum inducts students into the discipline of the subject by developing fluency, providing the ability to reason mathematically, and giving students the resilience to solve problems.

Our curriculum provides our students with the opportunity to progress from the concrete into the abstract, by scaffolding the process of our students’ making conjectures and being able to generalise, the hierarchical nature of Maths lends itself to the progression from one to the other.

Year 7 Overview

In Year 7, the students focus is predominantly on their ability to work with number and proportion while then having an introduction to Algebra that will then be built upon in year 8. They focus on being able to apply their knowledge and work fluently between different types of mathematical and real-world contexts.

Half Term	Focus
1	• **Unit NP1 - Place Value & the Number Line** – including metric conversions and rounding to significant figures. • **Unit NP2 - Addition & Subtraction** – including perimeter of polygons and application with money.
2	• **Unit NP3 - Multiplication & Division** – Including rectilinear area and volume of cubes and cuboids.
3	• **Unit NP4 - Powers, Roots, and Primes** • **Unit NP5 - Order of Operations** – Including the introduction of brackets.
4	• **Unit NP6 - Directed Numbers** – Including the powers of negative numbers and contextual problems.
5	• **Unit A1 - Introduction to Algebraic Thinking** • **Unit NP7 – Fractions** – Including worded and binary fraction problems
6	• **Unit NP8 - Percentages, Fractions, and Decimals** – including interpreting pie charts and simple interest.

Homework:

Weekly homework will be set on Sparx maths and will take approximately 60 minutes. This will be based on topics that were taught this time last year.

Useful resources:

https://vle.mathswatch.co.uk/vle/
https://corbettmaths.com/

Assessment:

- Students are assessed at the end of each topic with a small 20-mark topic test which they store in their assessment folders at school and track their progress.
- Students are then assessed at the end of each term with a larger assessment which is out of 60 marks. This includes a synoptic element where they are assessed on previously learnt topics from earlier on in their mathematical journey.

Year 8 Overview

In Year 8, students continue to develop their algebra skills and have an introduction to geometry and statistics and probability.

They focus on being able to apply their knowledge and work fluently between different types of mathematical and real-world contexts.

Half Term	Focus
1	• **Unit NP8 - Percentages, Fractions, and Decimals** – including interpreting pie charts and simple interest. • **Unit NP9 - Estimation & Use of the Calculator** – Including truncation and error intervals
2	• **Unit A2 - Manipulating and Simplifying Expressions 1** – Including simplifying indices. • **Unit A3 - Manipulating and Simplifying Expressions 2** – Including factorising and expanding brackets.
3	• **Unit A4 - Linear Equations** – Including solving equations with unknowns on both sides and solving equations including brackets. • **Unit NP10 - Proportional Reasoning** – Including direct and inverse proportion
4	• **Unit NP10 - Proportional Reasoning (continued)** – Including Percentage increase/decrease and percentage change • **Unit GM1 - Drawing, Measuring and Constructing** – Including constructing perpendicular bisectors
5	• **Unit GM2 - Polygons & Angles** – Including angles in parallel lines and bearings • **Unit SP1 - Discrete Data** – Including graphical representations and the comparison of this data
6	• **Unit GM3 – Area** – Including areas of compound shapes. • **Unit NP11 – Ratio** – Including expressing a ratio as a fraction

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Year 9 Overview

In Year 9, students continue to build on their Number, Algebra, Statistics, Probability and Geometry skills from previous years.

Half Term	Focus
1	• **Straight Line Graphs** – including using a table of values, plotting straight line graphs, and exploring parallel and perpendicular lines • **Forming and Solving Equations** – including linear equations, with unknowns on one side and unknowns on both sides • **Testing Conjectures** – including making conjectures with number and algebra
2	• **Three Dimensional Shapes** – including properties of 3D shapes, surface area and volume • **Constructions and Congruency** – including drawing and measuring angles, constructing loci and bisectors, and recognising congruent shapes
3	• **Numbers** – including working with directed number, decimals, fractions, and an introduction to surds • **Using Percentages** – including percentage increase and decrease, percentage change and reverse percentages
4	• **Maths and Money** – including simple and compound interest, wages, and VAT • **Deduction** – including making conjectures with angles and shapes • **Rotation and Translation** – including making combining transformations
5	• **Pythagoras' Theorem** – including on a coordinate axes and 3D Pythagoras • **Enlargement and Similarity** – including positive and negative scale factors and similar triangles • **Solve Ratio and Proportion Questions** – including direct and inverse proportion and conversion graphs
6	• **Rates** – including speed, distance time and mass, density, and volume • **Probability** – including independent events and tree diagrams • **Algebraic Representations** – including quadratic graphs

Homework:

Weekly homework will be set on Sparx maths and will take approximately 60 minutes. This will be based on topics that were taught this time last year.

Useful resources:

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https://corbettmaths.com/

Assessment:

- Students are assessed at the end of each topic with a small 20-mark topic test which they store in their assessment folders at school and track their progress.
- Students are then assessed at the end of each term with a larger assessment which is out of 60 marks. This includes a synoptic element where they are assessed on previously learnt topics from earlier on in their mathematical journey.

Year 10 Overview

In Year 10, students start the OCR GCSE Maths course. Across the two years students will continue to build on their Number, Algebra, Geometry, Statistics and Probability skills and learn how to apply these skills to problem solving questions.

Half Term	Focus
1	• **Congruence, Similarity and Enlargement** – including fractional and negative scale factors and similar triangles. • **Trigonometry** – including Pythagoras, Non-right-angle trigonometry, and 3D trigonometry.
2	• **Representing Solutions to Equations and Inequalities** – including equations and inequalities with unknowns on both sides and solving by factorising. • **Simultaneous Equations** – including linear and quadratic simultaneous equations.
3	• **Angles and Bearings** – including scale drawings and bearings with Pythagoras and trigonometry. • **Working With Circles** – including arc length and sector area and circle theorems. • **Vectors** – including arc length and sector area and circle theorems.
4	• **Ratios & Fractions** – including contextual 'best buy' problems. • **Percentage & Interest** – including growth and decay and iterative processes.
5	• **Probability** – including the use of tree and Venn diagrams. • **Collecting, representing & interpreting data** – including box plots and histograms.
6	• **Non calculator methods** – including surds and limits of accuracy. • **Types of number and Sequences** – including finding the nth term of a sequence. • **Indices and roots** – including the use of fractional and negative indices

Homework:

Weekly homework will be set on Sparx maths and will take approximately 60 minutes. This will be based on topics that were taught this time last year.

Useful resources:

https://vle.mathswatch.co.uk/vle/
https://corbettmaths.com/

Assessment:

- Students are assessed at the end of each topic with a small 20-mark topic test which they store in their assessment folders at school and track their progress.
- Students are then assessed at the end of each term with a larger assessment which is out of 60 marks. This includes a synoptic element where they are assessed on previously learnt topics from earlier on in their mathematical journey.

Year 11 Overview

In Year 11, students complete the OCR GCSE Maths course. They will the begin a bespoke curriculum that will be created based on each classes needs using the data from the QLA of mock exams.

Half Term	Focus
1	• **Straight Lines and Gradients** – including finding the equations of lines • **Non- Linear graphs** – including quadratic, cubic, and reciprocal graphs • **Using Graphs** – including distance time graphs and direct/inverse proportion graphs
2	• **Expanding and Factorising** – including completing the square and using quadratic formula • **Changing the Subject** – including using formulae and iteration • **Functions** – including inverse and composite functions and solving quadratic inequalities
3	• **Bespoke Curriculum** – QLA from mock exams informs what topics each class will be completing
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5	• **Bespoke Curriculum** – QLA from mock exams informs what topics each class will be completing
6	• **Y11 GCSE Examinations**

Homework:

Weekly homework will be set on Sparx maths and will take approximately 60 minutes. This will be individualised to each student's specific level of learning and based on our schemes of learning.

Useful resources:

https://www.sparxmaths.uk
https://corbettmaths.com/

Assessment:

- Mock exams in November – 2 Papers (1 calculator paper and 1 non-calculator paper)
- Mock exams in February- 3 Papers (2 calculator papers and 1 non-calculator paper)
- Students are assessed at the end of each topic with a small 20-mark topic test which they store in their assessment folders at school and track their progress.