

OCL Maths Curriculum: Statement of Intent

Purpose of study

The OCL Maths Curriculum is designed in conjunction with Mathematics Mastery. This means that pupils are given a “thorough understanding of mathematical concepts, rather than a set of techniques or routines to get to the right answer” (EEF). We want our students to be curious learners who can apply their knowledge and skills to the real world. We enable them with the powerful knowledge that allows them to acquire fluency in crucial mathematical procedures and means they can master and retain key concepts which in turn will result in all students fulfilling their academic potential in maths.



We value character, competence and community in our curriculum:

- **Character:** Our Maths lessons ensure that all students develop confidence in Maths, and identify as “good at Maths”. Through talk tasks to check for understanding, the participation of all students in articulating mathematical ideas is a key feature of our teaching. Students are taught to interact with each other with patience, honesty, and independence through opportunities for structured self-reflection throughout the lesson: in self and peer assessment, exit tickets, and mastery matrices.
- **Competence:** Developing pupils’ competence in Maths is at the heart of our curriculum. We build strong foundations by taking every opportunity to develop our students’ numeracy skills: in lessons, and in structured interventions. In our curriculum, we draw on research from cognitive science to accelerate our students learning. We connect new knowledge to existing knowledge, to expand students’ schemas, and develop their skills in the core concepts of Maths.
- **Community:** Through an engaging, relevant Maths curriculum, students are exposed to the story and history of mathematical ideas. In this way students develop respect for others and an appreciation of diversity and inclusivity, and learn how to challenge and question. Students also have the opportunity to develop their passion, their identity, and their sense of belonging, through success in Maths, and through trips and after-school clubs, in different forms across the trust.

Core concepts and principles of progression

The Oasis Maths curriculum is carefully planned so that core mathematical skills, knowledge and understanding are developed over time. Mathematical knowledge is understood and built on cumulatively, and in the context of applying this knowledge to develop skills. These core mathematical skills build on the “big ideas” of the OCL Primary curriculum, and exceed the objectives of the Maths national curriculum for KS3/4. They are laid out below:

- **Mathematical fluency.** This builds on the OCL Primary Maths curriculum’s big idea of “fluency”.
 - Developed when we teach procedures.
 - Developed when we teach facts, and test students on their knowledge organisers.
- **Mathematical representation, language, and notation.** This builds on the OCL Primary Maths curriculum’s big idea of “representation and structure”.

- Multiple representations are used during new learning, we introduce definitions and new language explicitly.
- Teachers model and insist that students use this taught mathematical language. Teachers and students also use mathematical notation correctly at all times, in order to prepare students for future mathematical study, to ready learners for the application of Maths to other subjects, and to avoid embedding misconceptions.
- Definitions and mathematical language are also in our knowledge organisers, and we use the spaced testing effect to embed this knowledge.
- **Mathematical thinking.** This builds on the OCL Primary Maths curriculum's big idea of "mathematical thinking".
 - Analytical thinking
 - Students are taught to observe carefully, and to comprehend all the information in a question, and reorganise it into a diagram, or a "simpler problem".
 - Students are taught to think logically and systematically about the different possible ways to approach the problem, and how to decide on a way forwards.
 - Proportional thinking
 - Students are taught to be able to handle problems in ratio and proportion, and understand topics like percentages, fractions of amounts, direct/inverse proportion, sequences, and ratios as a related schema (bar models are used to make this pictorial).
 - Statistical thinking
 - Students are taught to understand how measures of central tendency and measures of spread can help us to draw inferences about populations.
 - Students encounter large sets of data, and understand how to collect, represent, and interpret it.
- **Mathematical reasoning.** This builds on and further extends the OCL Primary Maths curriculum's big idea of "mathematical thinking".
 - Students are taught to reason abstractly, to understand cause and effect through "if, then" relationships, as well as "if and only if" relationships.
 - Abstract reasoning, such as solving equations, and finding missing values is taught explicitly, and builds on the fundamental skills of mathematical fluency, mathematical language and notation, and mathematical thinking.
 - The disciplinary knowledge of deductive proof, and formal mathematical argument is taught later in the curriculum, as it requires students to have gained mastery in many other areas, and to have acquired automaticity in many mathematical processes. Example curriculum areas are: area and perimeter problems, algebraic methods, circle theorems, proof.
- **Problem-solving.**
 - Students are taught to experiment and form hypotheses.
 - Students are also taught explicit problem-solving techniques, like 'drawing a picture', asking a related simpler problem, and "trying out numbers".
 - Students are shown typical problems and taught to relate unseen problems to those they have encountered before.
- **Conceptual understanding.** This builds on the OCL Primary Maths curriculum's big idea of "variation".
 - Conceptual understanding is developed by showing examples and non-examples, by having students articulate their knowledge, and by activating prior knowledge and embedding new knowledge in these contexts, so that students are supported to create connected schemas in their minds.

Aims and Outcomes

The aim of our curriculum is to inspire in our students a love of Maths, and a confidence in applying it in their lives. We want our students to understand the history of our subject as one which has developed over millennia of collective human endeavour, and which is embedded in every facet of our civilisation. We also want our students to identify as being “good” at Maths, and feel confident in applying the ideas they have learnt to any field or pursuit they engage with.

Through our carefully sequenced and ambitious curriculum we intend that our students will be able to:

1. **Develop fluency** in the fundamentals of mathematics, including 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.
2. **Reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
3. **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.