



Mathematics

Curriculum Intent

The mathematics department will create confident and successful mathematicians that can apply knowledge to a variety of contexts and situations. We ensure students are given the opportunity to consolidate and discuss mathematical problems and concepts. Students' knowledge will become secure through careful tracking, which allows all to have a deep understanding of mathematical concepts.

The curriculum design enables students to acquire a deep, long term, secure and adaptable understanding of the subject. Students will be stretched and challenged, through a variety of carefully planned resources encouraging both independent and collaborative thinking.

As a knowledge-based curriculum, we believe that this is the key to our students having a deeper understanding. This type of curriculum allows the students to build on what they already know and develop the skills required to understand the application of maths in the real world. The curriculum is also spiralled so that the students have the opportunity to expand, develop as well as revise content, allowing them to constantly recap knowledge as well as build on it.

The spiral structure of the curriculum allows pupils to revisit topics and deepen understanding through problem solving and application. The curriculum is sequenced carefully to ensure a balanced delivery of content across the five strands and to ensure it is delivered to ensure progress over time.

For example: In Year 7, pupils build on basic knowledge of algebraic notation and manipulation; in Year 8 they retrieve and apply the knowledge to forming and solving equations from a range of contexts. In Year 9, the knowledge acquired in Year 7 and 8 is revisited and applied to algebraic fractions and factorisation, proof and generalisations. Throughout the key stage, knowledge is developed and applied to real life problems which enables pupils to progress and deepen their understanding through application. This is through exposure of specific reading materials and cross curriculum links that support the academy's ambitions to improve students' cultural capital as well as fiscal understanding to be successful members of the community.

The pupils

Application of recent research is applied to ensure teaching and learning is maximised. Using this knowledge, inbuilt within the curriculum, there is time to explore applications for mathematics across the curriculum. Financial, numerical and practical applications of numeracy are examined, as well as developing strategic and logical thinking through themed weeks. This develops both a love of mathematics, as well as ensuring students have the skills to be successful adults and citizens once they have left the academy.

Opening minds, opening doors.

Honesty • Excellence • Aspiration



STEM week is an event scheduled in the summer term. STEM week allows our pupils to experience real life maths. They see the value of maths in other subjects and this also raises their aspirations around the world of work and how maths underpins so many different career paths. The event allows pupils to explore many avenues of maths, deepening their knowledge in a range of activities, and hence discovering how maths is a universal language.

Throughout the year, the department organises further events which allows pupils to engage with mathematics meaningfully, whilst enhancing problem solving and logical thinking skills. External visitors are invited into the academy to make our pupils aware of the non-traditional maths careers post school, whilst simultaneously allowing pupils opportunities to acquire a deep, long term, secure and adaptable understanding of the subject. For example: the Department of Mathematics at The University of Manchester; The Bank of England; NRICH Roadshow; Stand-up maths and Willmott Dixon.

Implementation

At Key Stage 3, the students will cover the five main strands of mathematics that are embedded throughout the national curriculum:

- Geometry
- Ratio and Proportion
- Algebra
- Number
- Statistics

These key components have been separated to allow students to become solid in key fundamental skills needed for Key Stage 4 and beyond. Common misconceptions with our students have been challenged, with the separation of commonly confused topics. For example, area and perimeter and transformation of shapes. This will allow both teachers and pupils to develop an understanding of the concept without confusion – ready to apply knowledge in Key Stage 4.

At Key Stage 4, these key strands are then built on and extended, in order to prepare our students for their working life outside of academy, but to also ensure that they have the skills and knowledge required in order to be successful citizens in our modern-day society.

Formative and summative assessments are used to ensure planning and learning strategies are reactive to the students learning progression. Sequencing of lessons will differ to allow a personalised learning journey and ensure the needs of all students are met. This is using the key concepts of mastery, including the principle that all students can succeed.

This curriculum is supported through the use of online resources to develop fluency of skills. Online resources are chosen based on maximising progress and impact for all and they incorporate recent research on the effectiveness of learning. For instance, Hegarty maths is used as the main homework platform; this incorporates retrieval and interleaving strategies to aid long-term memory.

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