



Mathematics curriculum intent

Mathematics is fundamental. From money management to measuring when cooking, driving a car to decorating a room, it can be seen in all aspects of everyday life. The beauty of Mathematics can be seen in art and nature and it is critical to most forms of employment including science, engineering, finance and construction. At Kassia Academy, it is our intent to foster a love of Mathematics whilst creating a foundation for understanding the world, developing critical problem solving and reasoning skills, cultivating enquiring minds and building independence.

The aim of the curriculum is to create fluency between mathematical ideas regardless of background and starting points. Throughout the key stage 3 and key stage 4 curriculum, it is important that students are supported and lessons sequenced in such a way that information is reviewed and key concepts, known as Golden Threads, are revisited so that key learning is built upon progressively and any gaps in knowledge are filled. The Golden Threads in Mathematics include: Balancing, Skills for life, Analysing data, Keeping things in proportion and Defining properties.

Curriculum overview

All students in key stage 3 and key stage 4 follow the National Curriculum. These are set out by the National framework and are organised in five main Mathematics strands. The areas covered are: Number, Ratio and Proportion, Algebra, Geometry and Measures and Probability and Statistics.

In key stage 3, we build upon mathematical skills each year, checking that the foundations of each skill are secure before extending; enabling students to recall and retrieve prior knowledge. All students have the same opportunities to access the content delivered and are stretched in every area.

To support the delivery of our curriculum, we use pre and post testing of each unit to ensure that our students are accessing a programme that is tailored to their needs. Termly assessment weeks are in place to ensure key areas are revisited and to support students' recall and retrieval.

In key stage 4, the curriculum allows students to further their progress by using the fundamentals gained in key stage 3 to underpin the new content learnt, checking that the foundations of each skill are secure and enabling the students to recall and retrieve prior knowledge. As with key stage 3, a combination of pre and post testing is in place for each unit. Mock examinations are also in place in November and March of both year 10 and 11 to give the pupils the experience of a formal examinations with the aim to reduce anxieties before the official examinations in May and June. There are three levels of entry: Entry level, GCSE foundation level and GCSE higher level.

All pupils complete the Entry level qualification which consists of eight components: properties of number, the four operations, ratio, money, the calendar and time, measures, geometry and statistics. These are completed throughout the school year in line with the topics taught at GCSE level.

The GCSE examinations are broken down into three separate Mathematics papers: one non-calculator and two calculator papers, each lasting one hour and thirty minutes. The assessment objectives for the three papers combined have the following weightings of skills:

Topic Area	Foundation Maths	Higher Maths
Number	25%	15%
Algebra	20%	30%
Ratio and Proportion	25%	20%
Geometry and Measures	15%	20%

Probability and Statistics	15%	15%
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GCSE Statistics is an option for some pupils, to broaden their knowledge in a key component of Mathematics that is relevant to everyday life. It gives a deeper understanding of the statistical content in Mathematics whilst developing transferable skills and understanding that is applicable to a range of other subjects and careers. This is assessed over two examinations lasting one hour and forty-five minutes each.

Developing literacy and oracy in Mathematics

At Kassia Academy, we feel that pupils make better progress if maths language and literacy are explicitly taught. We aim to give all students the communication skills to become excellent problem solvers by developing structured speaking, vocabulary, writing and reading to help them solve mathematical problems.

The positive effects of an increased vocabulary and the ability to speak mathematics are essential to understanding. During every mathematics lesson, there is an opportunity to engage in dialogue that supports, deepens and challenges understanding in a structured way. Essential keywords and definitions, that are relevant to the topic, are provided and placed in context to support students understanding. Rich tasks encourage discussion and plenaries include a deeper level of questioning to extend conceptual understanding. Active listening skills and turn-taking are developed as students have the opportunity to question and challenge their peers' understanding and teacher's explanations. This enables teachers to address any misconceptions before progression onto deeper level questions. Students are encouraged to develop their writing skills with the use of modelling and writing frames to set out question workings and write explanations.

Teaching comprehension is a vital part of the mathematics curriculum. Worded mathematical problems contain multiple concepts and texts and includes symbols, diagrams, tables and units. An important part of a mathematics lesson is teaching students how to interpret, make connections and understand how all of these form part of a bigger problem. We do this by reading out text to the class and highlighting keywords and phrases as they appear, modelling how to extract information from texts so the problem can be represented algebraically, numerically or using a diagram and providing a high level of exposure to these types of questions.

Cross curricular

Mathematics is a key skill within many curriculum areas. The curriculum has been designed to ensure students are taught cross curricular mathematical concepts across key stage 3 and key stage 4. Some examples are Science, Food technology, Art and project based learning. In Science, this includes applying formulas to solve physical, biological and chemical problems, collecting, organising and analysing data and calculating measures accurately. In food technology it includes accurate measuring and the use of ratio and proportion to calculate the mass and capacity of ingredients required and value for money. In geography it includes analysing data and graphs and studying populations and birth and death rates. In art, it includes the use of scale, perspectives, symmetry and the golden ratio.

Developing capital culture in mathematics

At The Kassia Academy, capital culture in Mathematics involves creating an inclusive learning environment where students are empowered and able to fully participate in mathematical inquiry regardless of their background or socioeconomic status. Students are encouraged to embrace challenges and consider feedback from the teacher in order to develop learning. In addition, we provide opportunities for students to engage in STEM based activities from external providers. Opportunities are given throughout the year to engage in mathematical days which include Pi Day and national numeracy day and looking at mathematical concepts from different cultures around the world.

Extra-curricular

Students are given the opportunity to engage in mathematical learning outside of the classroom. This includes playing mathematical games, engaging in numeracy interventions such as Success@arithmetic in key stage three and revision sessions for key stage four.

In conclusion, our mathematics curriculum is designed with a clear vision aimed to foster a good understanding of mathematical concepts, encouraging students to develop their inquiry-based skills and nurturing curiosity. By integrating literacy, oracy, cross curricular and capital culture into mathematics teaching, our aim is for students to use these skills to problem solve and contribute positively to the world around them.

