MATHEMATICS

INTENT

The Maths curriculum is essential to everyday life and is critical to many subjects like science, technology and engineering. In Maths we will develop logical, reasoning and thinking skills based on the knowledge of each topic they learn. Pupils will use their understanding of the mathematical concepts to develop their problem-solving skills including understanding where errors are made and how to correct these.

We aim to develop:

- critical and logical thinkers
- an awareness of how mathematics is used in all aspects of life
- an ability to use topics taught in a wide variety of problem solving situations

At KS3 we will build on the curriculum set in KS2. Children will develop their fluency, reasoning and problem-solving. Within the KS3 curriculum there will be challenge and depth of understanding within each topic.

The KS3 curriculum covers:

- Numbers
- Algebra
- Ratio, proportion and rates of change
- Geometry and measures
- Statistics

The GCSE specification builds on the content, knowledge and skills developed at KS3. During KS4 pupils are encouraged to take an increased responsibility for their work. They will become fluent in making connections between the different areas of Mathematics and its application in the world around them. Pupils will learn the importance of precision and rigour.

IMPLEMENTATION

Subject specialists have given consideration and thought to the sequence and rationale of the curriculum; why we teach the content we do and in the order that we do. This is to ensure knowledge is not isolated information; it is connected knowledge that enables comprehension.

At Key Stage 3, the full National Curriculum is delivered. The Maths curriculum is organised into units. Each unit builds on prior knowledge allowing connections to be

made and enables knowledge to be transferable. In Maths, we believe this facilitates deeper comprehension. The unit content taught is chosen so lessons focus on developing deeper understanding and capacity for skilful performance.

At Key Stage 4, the full Maths Edexcel GCSE is delivered. Content is structured into units. The curriculum is designed to ensure students develop and master mathematical fluency, reasoning and problem-solving skills. Each lesson builds on prior learning, allowing connections to be made between content. Units have been organised and designed to promote learning and provide depth and breadth of understanding

IMPACT

In 2023, 67% of students received a grade 4 or above in GCSE Maths followed by 66.67% in 2024. In Maths, students' progress is significantly above national averages across all measures due to the high-quality teaching and learning that takes place. We are fortunate that all teachers are highly skilled and subject specialists with the ability to teach across key stages.

EXAMINATION

Paper 1: Non-calculator - 33 1/3% of GCSE
1 hour 30 minutes
A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as the pupil goes through the paper.

Paper 2: Calculator - 33 1/3% of GCSE
1 hour 30 minutes
A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as the pupil goes through the paper.

Paper 3: Calculator - 33 1/3% of GCSE
1 hour 30 minutes
A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as the pupil goes through the paper.

HOW ARE STUDENTS SUPPORTED IN Mathematics?

Students at MEPA Academy are supported through a range of reasonable adjustments personalised to the student. The reasonable adjustments include but are not exhaustive to: providing templates for graph, tables, grids to students, use of Pencil grips/Easy Writer pens and pencils, scribing for students, providing extra time, use of writing slope, effective and appropriate seating, directed questions, use of Rest/calm/movement breaks. Teachers use a range of reasonable adjustments for each student to maximise their opportunities to learn.

EXTRA CURRICULAR AND ENRICHMENT

To Read

- Why Do Buses Come in Threes?: The Hidden Mathematics of Everyday Life Rob Eastaway, Jeremy Wyndham

- How Long Is a Piece of String?: More Hidden Mathematics of Everyday Life Rob Eastaway, Jeremy Wyndham
- How Many Socks Make a Pair?: Surprisingly Interesting Everyday Maths Rob Eastaway
- Singh, S (2002) The Code Book: The Secret History of Codes and Code-breaking
- Singh, S. (2014) The Simpsons and their Mathematical SecretsSingh, S (1997) Fermat's last theorem
- Bellos, A. (2011) Alex's Adventures in Numberland
- Barrow, J D (2000) The Book of Nothing
- Bellos, A. (2015) Alex through the Looking Glass
- Stewart, I. (2010) Professor Stewart's Hoard of Mathematical Treasures

To Watch

- What Maths Really Does - Professor Alain Goriely
- Forbidden Crystal Symmetry - Sir Roger Penrose
- Big Data's Big Deal - Professor Viktor Mayer-Schonberger
- Love and Math - Professor Edward Frenkel
- Closing the Gap: the quest to understand prime numbers - Vicky Neale

To Listen

- Mr Barton Maths Blog | Podcast http://www.mrbartonmaths.com/blog/category/podcast/ Mr Barton is a Maths Teacher, TES Maths Adviser. Listen to this podcast where he shares techniques to solve maths efficiently.
- The Numberphile Podcast https://www.numberphile.com/podcast Interviews with people who love numbers and mathematics.
- Math Mutation http://mathmutation.blogspot.com/ a podcast for people of all ages where we discuss fun, interesting, or just plain weird corners of mathematics that you would not have heard in school
- Mathematical Objects https://aperiodical.com/podcasts/mathematical-objects/ Katie Steckles and Peter Rowlett chat about some aspect of mathematics using a mathematical object as inspiration.
- The Art of Mathematics https://anchor.fm/the-art-of-mathematics Conversations, puzzles, book reviews, conjectures solved and unsolved, mathematicians and beautiful mathematics. No math background required.
- Tetrahedra https://anchor.fm/Tetrahedra A math and science podcast providing a brief yet comprehensive presentation into a wide variety of STEM topics and DIY project ideas and challenges.
- Relatively Prime Stories from the Mathematical Domain https://relprime.com/ A mathematics podcast from ACMEScience featuring the best math stories from the world of maths.

To Research

- How can quadratic inequalities assist engineers when designing new equipment?
- How can you model the flight of a ball and predict where it will land?

- Mathematical investigations – Follow this link to discover a number of investigations to put your Maths skills to the test.

To Visit

- Bletchley Park
- Bank of England Museum
- British Museum
- LEGOLAND® Windsor Resort

SPIRITUAL, MORAL, SOCIAL AND CULTURAL AWARENESS AND LEARNING

Problem solving encourages a sense of fascination, enjoyment and creativity in learning

CAREERS RELATED LEARNING

The logical thinking, problem-solving and decision-making skills you learn while studying mathematics can lead to careers in computing & IT, business & finance, science & engineering.

Mathematicians and statisticians are in demand across a range of sectors including; education, engineering, finance, banking and accountancy, government, insurance, IT, business & consultancy, market research and marketing, medicine and health, petroleum and nuclear industries, space science and astronomy.

Career Ideas: acoustics, actuarial work, astronomy, accountancy, data analysis, data science, banking, investment, research, computing/IT, software engineering, sound engineering/music production, statistician, economist, financial management, trading, stockbroker, games design, insurance underwriting, meteorology, palaeontology, surveying, engineering (all branches), education and much more.