Subject: Maths

Year 11

OVERVIEW

The Maths department at the Lowry Academy aims to provide students with a secure understanding of mathematical knowledge, categorised according to the following areas: number, algebra, geometry, ratio and proportion, probability, and statistics, meeting the needs of the National Curriculum at KS3 and KS4. The focus of the curriculum is to develop procedural knowledge of the fundamental elements of mathematics in order for students to access further problem solving elements and reason mathematically, whilst fostering a love of maths. In Year 11 students are taught a bespoke curriculum to provide personalised improvements for all students. A number of strategies are used in order to best prepare students for their GCSE examinations.

AUTUMN

SPRING

SUMMER

New topics introduced in Y11:

Foundation

- Trigonometry
- Transformations
- Scale diagrams and bearings
- Similarity and congruence
- Vectors
- Constructions and loci

Higher

- Vectors
- 3D Pythagoras and Trigonometry
- Circle Theorems
- Transformations of graphs
- Iteration
- Algebraic proof
- Constructions and loci
- Gradient and area under a curve

Once new topics have been covered students are taught bespoke lessons to address specific gaps for students. These individualised lessons include recalling prior learning as revision aid and moving from short term memory to long term memory. Students will also be exposed to problem solving style questions to model how different strands of mathematics are linked and how to identify this within questions.

Assessment

Throughout the year, Y11 students have a number of formative and summative assessments in order for teachers to closely monitor progress and identify any gaps to be closed. These inform the department and individual class teachers of the content for lessons, revision sessions, homework and starter tasks.

Students will complete a KPI test at the end of each topic, complete fluency tests every fortnight and participate in pre-seen and unseen exam papers (in which students are modelled carefully selected questions from an exam paper each fortnight and a week later are given an adapted version to complete independently). This allows students to have crucial exposure to exam questions to prepare for the GCSE.

Y11 students will also complete a set of Mock papers in October and then again in March. These consist of 3 papers per exam series (1 non-calculator and 2 calculator) to mimic the public examination.

Personal Development

Spiritual**:** Many mathematical problems involve finding answers through logic and reasoning. The whole purpose is to demonstrate the power of deductive logic and problem solving through use of rigorous, proven techniques. This should encourage pupils to question "why" more often, to interrogate motives and to avoid assumption when analysing any given problem. These skills should transfer to the less abstract situations facing our students daily. This is pertinent in topics covered in year 11 such as circle theorems, transformations of graphs and trigonometry.

Social: Verbalising and discussing mathematical problems is one of the most powerful tools we have in arriving at their solutions. Many topics have a direct and deep sociological impact or effect. We teach co-ordinate geometry, bearings and vectors which are the bedrock of so many "real life" applications of mathematics that have had and still have profound consequences to human development (eg wireless communications, GPS, flight, electronics). This is relevant when covering topics in year 11 which as commonly used in daily life such as vectors, bearings and construction and loci.

Cultural: All mathematics has a rich history and a cultural context in which it was first discovered or used. The most ancient of our knowledge we owe to the Babylonians, Egyptians, Greeks and Arab and Vedic mathematicians. We also explore the lives of various mathematicians during our Reading to Learn opportunities. Mathematics also has deep links to cultural subjects such as art, music and sport. Factors and multiples build rhythm and design percussion, ratios mathematically explain pitch and tuning and trigonometric functions describe and of sound waves. An understanding of scale, similarity and surds help to explain numbers associated with focal length in photography and packaging design in technology. The world of professional sport has been revolutionised by statistics and their analysis. This underpins all of mathematics but is more obvious is topics covered in year 11 such as trigonometry, Pythagoras and circle theorems.

Useful resources for supporting your child at home

- Corbett Maths
- Pearson Online
- Maths Genie
- Hegarty Maths

Homework

Students will complete weekly homework on Hegarty (online platform) Homework is set every Monday and is due in every Monday. Students must achieve amber in order for the task to be marked as complete and are encouraged to seek help if they do not understand.