MATHEMATICS

Entry Requirements: Grade 6 in Mathematics
Exam board: Edexcel (Course Code: 9MA0)
Full Subject Specification website: https://qualifications.pearson.com/en/qualifications/edexcel-a-levels/mathematics-2017.html

Why study Mathematics:

Mathematics touches more aspects of modern living than ever before – communications, media, and financial management as well as the more traditional computer and physical sciences, engineering, technology and business related subjects. The list continues to grow! Mathematics has long been regarded as a 'facilitating subject' giving future employers, universities or colleges clear evidence of highly valued numeracy and problem-solving skills irrespective of the actual role/course being considered.

Here at Stratford upon Avon School, we have staff who, prior to becoming mathematics teachers, have many years direct experience of the application of mathematics within a wide variety of industrial, commercial and public sector organisations – not as mathematicians but as engineers and management accountants and scientists. In some cases, this has also involved working overseas.

An A level in Mathematics in conjunction with other subjects ensures the widest possible range of future careers – many amongst the most lucrative as well as the most interesting and rewarding. Indeed, many such careers have yet to be defined and are still waiting for the technology to catch up and it is mathematics that makes this possible!

Subject Specification Outline:

This specification (introduced in September 2017) consists of two compulsory components (pure and applied mathematics):

1. Pure Mathematics 1 & 2: (together represent 67% of the A level): This is the basic mathematics – the rules, formulae and techniques that are used in the various applications of mathematics. These rules are widely found across many diverse applications, whether deep within the code of a smartphone app or whether being used to analyse trials of new vaccines or to ensure the performance of a new car engine. They build on the mathematics you did at GCSE – indeed you will find many familiar topics – some with additional context to make you think!

Pure content will include: proof, algebra and functions, coordinate geometry in the (x, y) plane, sequences and series, trigonometry, exponentials and logarithms, differentiation, integration, numerical methods, vectors.

2. Applied – Statistics & Mechanics:
(together represent 33% of the A level):
Statistics includes probability and is the evaluation and quantification of risk and the manipulation of data in order to gain information or insight. You will already be familiar with calculating simple probabilities and using different types of average and spread for small sets of data. This will be extended to look at more complex risk problems and larger sets of data. Indeed, the handling of very large data sets (medical trials for new vaccines, census data, on-line surveys) made possible by modern computers and the internet is currently one of the fastest growing applications of mathematics and hence careers.

Mechanics is the mathematics behind how things work in the real world and is closely linked with physics. All engineering disciplines have their origins in physics – with their mathematics elements catered for by mechanics. Even if you have no desire to become an engineer, the problem-solving skills developed in association with mechanics are valued across all colleges, universities and workplaces.

Statistics content will include: Statistical sampling, data presentation and interpretation, probability, statistical distributions, statistical hypothesis testing.
Mechanics content will include: quantities and units in mechanics, kinematics, forces and Newton's laws, moments.

Progress Assessment:

- Formal exam-style homework on a 3-weekly cycle
- Ongoing ½ termly assessment
- Mock examinations at the end of terms 1 and 2
- End of year 12 examination.

Final Exam Format:

Three equally weighted written papers each of 120 minutes. Papers 1 and 2 are both Pure Mathematics whilst paper 3 is Statistics and Mechanics (combined). There is no coursework. All papers to be sat on completion of the course and all must be sat within the same examination season (no individual paper resits are permitted).

Self Study Requirements:

Each taught hour will require a minimum of an additional two hours of self study (split between supervised study in school and homework). Teaching staff will give guidance as to material to be covered or completed and associated deadlines.

Progression Pathways:

Mathematics is regarded as a 'facilitating subject' and offers evidence of numeracy and problem-solving skills. Mathematics is a key partner subject for Physics.

A level Mathematics supports a wide range of university level Mathematics courses (first and second degree):-

- Pure Mathematics
- Applied Mathematics
- Single/joint honours with many other subjects

A level Mathematics also supports an even wider range of science, engineering, economics, business studies, computer science courses (and indeed may be an essential requirement for certain courses/universities)

It also supports a wide range of A level entry specialist and general management careers (e.g. accountancy, engineering and retail based companies).