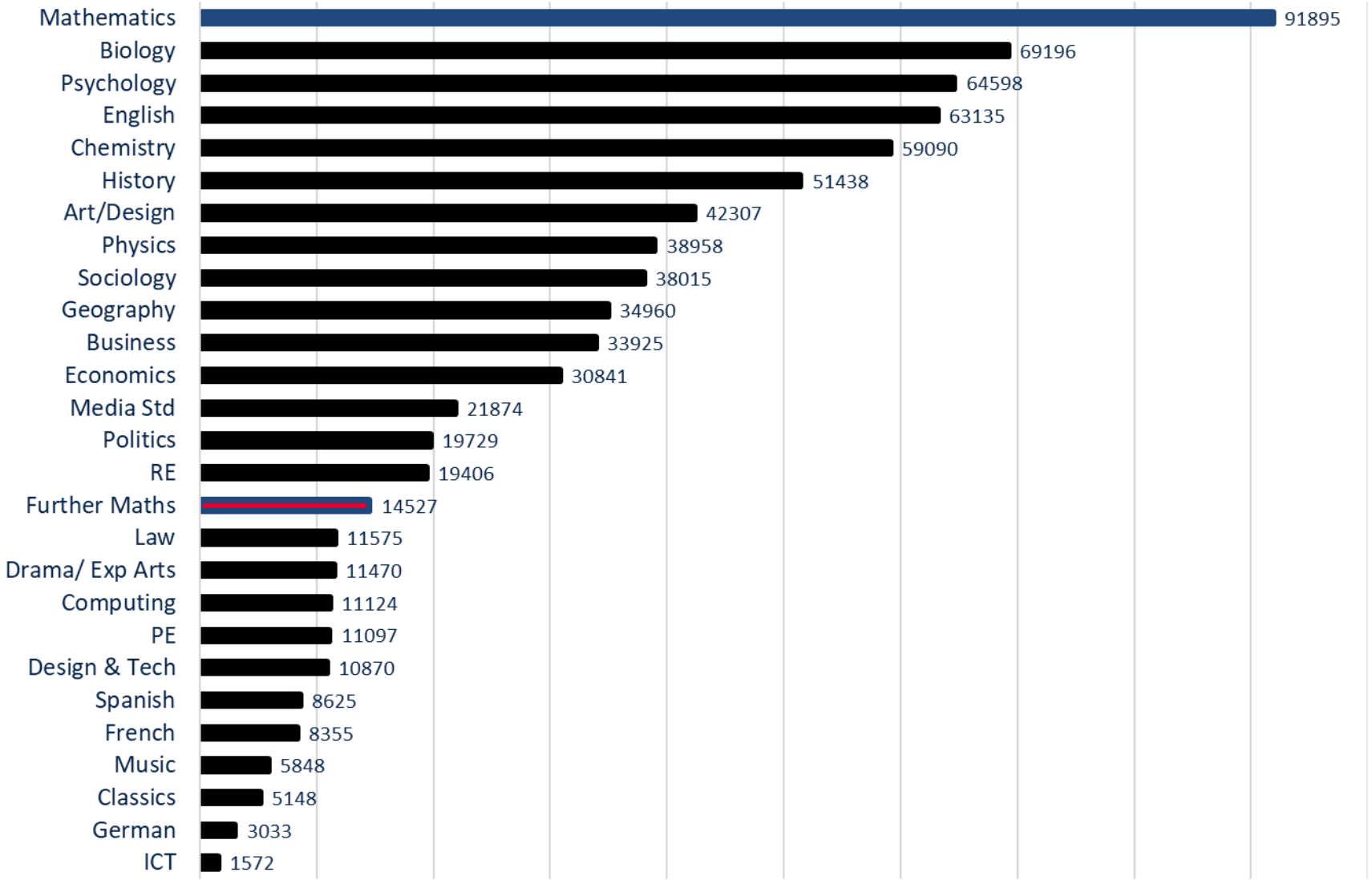
A Level Mathematics

A-level maths is one of the most popular subjects at RPS. Approximately 30-35 students choose this course, usually split across 2 classes.

In fact it's the most popular course in the country:

2019 UK A level entries by subject (JCQ data)



Why study Mathematics A level?

Studying Mathematics will:

- provide a stimulating and challenging course;
- develop key employability skills such as problem-solving, logical reasoning, modelling skills, communication and resilience;
- increase knowledge and understanding of mathematical techniques and their applications;
- support the study of other A level subjects;
- provide excellent preparation for a wide range of university courses;
- lead to a versatile qualification that is well-respected by employers and higher education.

But why study Mathematics A level at RPS?

- Our lessons are taught by some of the best teachers around (more on that later)
- We aim for lessons to be collaborative and a two-way process
- A variety of learning methods are employed
- Students will have come from different maths classes and develop new friendships. Often an unofficial maths homework club runs in the Sixth Form Common Room where students help each other ☺
- We have a successful history of supporting external students, new to RPS for Sixth Form, who fit in quickly and enjoy being part of our department

But why study Mathematics A level at RPS?

- We encourage and offer extra curricular mathematical activities such as the individual UKMT National Maths Challenge and Team Competitions
- Our teachers have experience and knowledge of University Admissions and can guide students with applications for STEM subject courses
- For students applying to OxBridge and other Russell Group Universities we offer support with interview preparation for STEM subject courses

Structure of the new A-Level Maths

The course builds on the work already studied at Higher Tier GCSE and will be a mix of the following:

- **Pure Mathematics**
- **Mechanics**
- **Statistics**

Entry requirements: GCSE Higher Grade 7 or above

Advisory: good algebraic fluency!

Test your Algebraic Fluency...

- Make *t* the subject of this formula:

$$m = \frac{3t + 5}{t - 2s}$$

- Simplify:

$$\frac{x^2 - 5x - 6}{x + 1} \div \frac{2x^2 - 5x - 3}{x^2 - 1}$$

Teaching

- Mathematics students are taught 5 hours a week and will do as many hours of independent study.
- They are taught by an expert and extensive team of teachers.
- They have opportunities to explore the use of technology both via graphical calculators and computer software.
- The course puts a significant emphasis on using and interpreting mathematical models.

Our A Level Mathematics teaching team:

We have one of the most enthusiastic, passionate and well-qualified teams of teachers in the county.

Some of our experts:

One member our team also works for the Advanced Maths Support Programme based at the University of Hertfordshire. She helps us to run our Russell Group problem solving workshops, helping students apply to top universities for STEM subjects

Several of our team have had previous careers in banking and accountancy

Two of our teachers both have maths degrees from the University of Warwick – one of the most prestigious institutions for mathematics studies

One of our expert mechanics teachers has a degree in Civil Engineering

One member of staff has taught in International Schools and works as an International Baccalaureate examiner

What is covered in A level Mathematics?

All of the content in the A level Mathematics qualification is compulsory and is the same for all examination boards.

Pure Mathematics **(66%)**

methods and techniques which underpin the study of all other areas of mathematics, such as, proof, algebra, trigonometry, calculus, and vectors.

Statistics **(17%)**

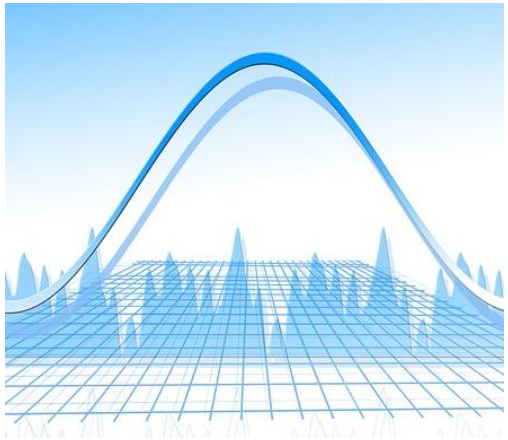
statistical sampling, data presentation and probability leading to the study of statistical distributions

Mechanics **(17%)**

the study of the physical world, modelling the motion of objects and the forces acting on them.

What is Statistics?

Reaching conclusions from data and calculating the likelihood of an event occurring.



"The majority of private sector organisations believe the use of data analytics will be the most important factor in increasing growth in UK businesses"

Professor Sir Adrian Smith

Source: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/630488/AS_review_report.pdf

What is Mechanics?

The modelling of the world around us, the motion of objects and the forces acting on them.

Students planning careers in physics or engineering would find mechanics particularly useful.

A Linear Course

A Level Mathematics is assessed purely by examinations (no coursework), all of which are taken at the end of Year 13.

There are 3 exams for the OCR board (which we currently follow):

Pure mathematics – 2 hrs

Pure maths & Statistics – 2 hrs

Pure maths & Mechanics – 2 hrs

A-level Maths: course requirements

- Students will be asked to purchase a textbook (approx. £20).

- Due to the “Use of Technology” element to the course, students are also required to purchase a new calculator. A graphing calculator, though not compulsory, is strongly recommended – this is a substantial purchase at around £90-100, though we usually try and subsidise this or buy in bulk for a discount

- A small contribution (approx £5) towards a subscription to the ‘Integral’ online resources.

What are the Career opportunities?

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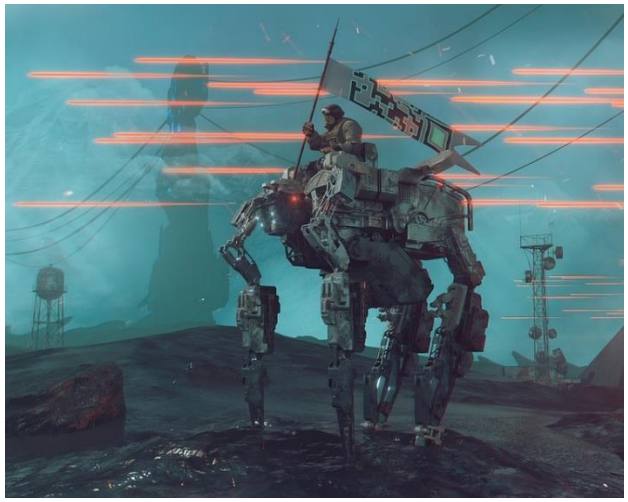
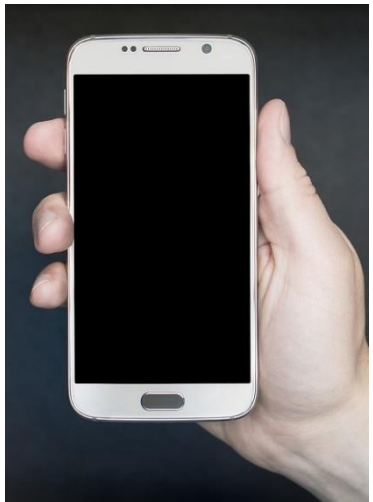
There is a huge shortage of people with STEM skills needed to enter the workforce.



There are many new applications of maths in technology:

- Medical Studies
- Games Design
- Internet Security
- Programming
- Communications



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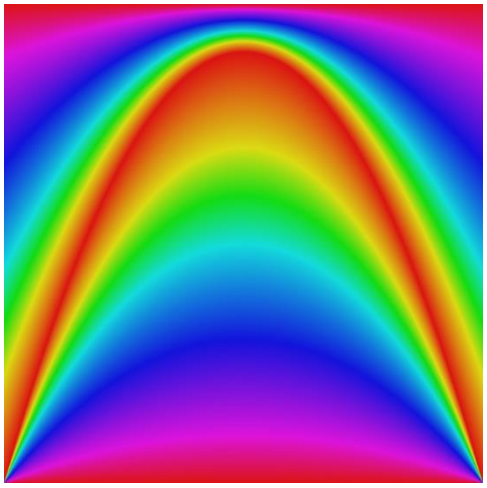
On-going applications in engineering, such as:

Aircraft Modelling
Fluid Flows
Acoustic Engineering
Electronics
Civil Engineering.

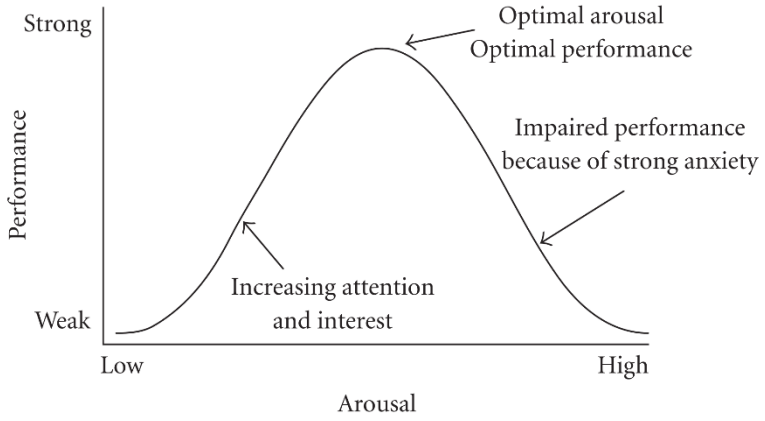


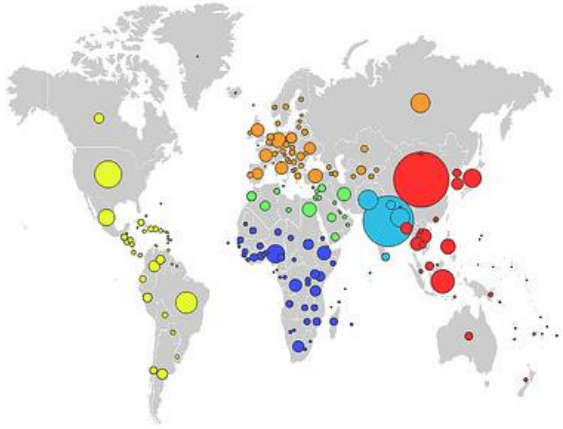
New scientific processes such as:

Modelling populations and Diseases
Quantum Physics
Astronomy
Forensics
DNA sequencing

What are the Career opportunities?

A good understanding of maths is beneficial for the study of chemistry, biology and geography.





Psychologists use statistics to analyse the relationships between variables and predict behaviours.

Lawyers rely on statistical data and the logical thought processes developed through the study of maths.

Other sources of information

- The mathematics teachers at your school
- AMSP website www.amsp.org.uk
- Maths Careers website www.mathscareers.org.uk
- Future Morph careers website www.futuremorph.org
- Universities and Colleges Admissions Service (UCAS) www.ucas.com
- Best course 4 me www.bestcourse4me.com
- Tomorrow's Engineers www.tomorrowsengineers.org.uk
- The Institute of Physics (IOP) www.iop.org