

# Freedom For Thinkers

Prospectus



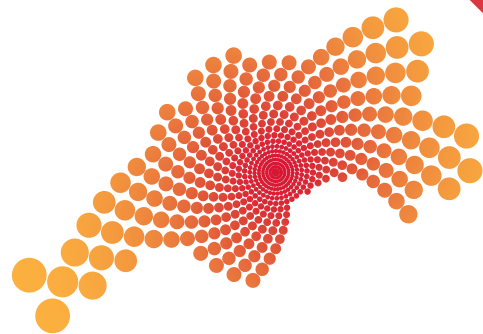






# Freedom for thinkers from across the South West.

Exeter Mathematics School (EMS) is an Ofsted Outstanding, state-funded 6th form specially designed for young people who really love maths, physics and computing. We welcome enthusiastic and adventurous students from all over Cornwall, Devon, Dorset and Somerset. There's a subsidised travel scheme and great accommodation if you're too far away for a daily commute.



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01

# Here's how we free you up to explore the subjects you love

- + **We minimise the barriers**  
Classmates who don't care; lessons that are just about passing exams.
- + **No-one needs forcing to do anything**  
You wear what you like, work with teachers as equals and build the confidence to pursue the ideas that really interest you.
- + **We push you further**  
With awesome teaching, opportunities to work with top Exeter University academics and loads of big, baffling, open-ended (and sometimes unsolvable) questions.
- + **You're part of one big family**  
We're close-knit and we all know each other. So even when you're boldly exploring new horizons, you're looked after every step of the way.



You are stretched and pushed to your limits – only to have your limits not what you thought they were. ^o^



02

# What you'll be studying

At Exeter Maths School the whole idea is to give you the freedom and challenge to push beyond normal sixth form study.

The majority of our students progress from EMS to studying STEM subjects at top universities. Our curriculum is designed with this in mind, giving you a great preparation for the challenging, independent enquiry-led culture you will experience as an undergraduate.



A small family of amazing people who all enjoy maths. 

Exceptional teachers help you explore the incredible creativity and excitement of maths, physics and computing while undergraduate mentors and maths professors from Exeter University open up fascinating new lines of thinking.

Uniquely, every student gets to take the Exeter Maths Certificate. This is the big highlight of our course: an opportunity to engage with demanding, real-life mathematics challenges set by one of our partners in academia or industry and carry out your own, in-depth research.

Alongside your core subjects at EMS, you also have the opportunity to broaden your study by drawing on the wide range of courses at Exeter College nearby.

## Here's how it works

Everyone at Exeter Maths School takes A-levels in:

- + **Mathematics**
- + **Further Mathematics**
- + **And either Physics or Computer Science or both.**

As a fourth A level, if you are not studying both Physics and Computer Science, you can choose a subject from the huge range of AS levels, A levels, BTECs and enrichment courses on offer at Exeter College.



# 03 Discover so much more about the subjects you love



## Mathematics & Further Mathematics

If you're the kind of maths student who's used to getting the answers right every time, here's where it gets exciting – because we're into the kind of mind-bending maths where solutions don't come so easily.

Every student takes Maths and Further Maths A levels as standard and we also prepare you for the STEP papers which are required for entrance to many top universities. And then we take you further...

You'll study modules in – for example – statistics, mechanics, pure maths with more depth than the A levels require. You explore the links between topics, discover their historical significance and get stuck into your own investigations. We get you thinking like a mathematician. But you will also learn how to communicate your findings and – thanks to our links with university research groups and industry experts – how your maths connects with the real world in so many ways.

## Physics

What could be more creative than exploring the secrets of the universe? Physics gives you the chance to equip yourself with tools that won't just help you explain the world around you but spark your imagination in loads of different ways.

As a physicist, you could eventually find yourself designing the next generation of solar panels or making a leap in medical physics or – maybe – finally unifying our understanding of the four forces.

Physics is one of your two choices for the third subject you get to take at A level at Exeter Maths School. But here again you have the chance to take it to a level beyond what's required in current syllabuses. You will learn through logical thought and practical work in our labs. We'll show you how to apply mathematical principles to develop understanding and underpin your progress. We'll also regularly introduce you to Exeter University academics involved in some of the most exciting research projects on the planet.

## Computer Science

Computer Science has the potential to change how we view the world. Could we be computing with DNA in the future - with computer circuits made of genes? Does the natural world 'compute'? What more can we learn about the world by observing the behaviour of interacting software simulations?

Computing is all about designing new sets of instructions or algorithms to solve new problems. There are so many great challenges for Computer Scientists to tackle and this course, with its emphasis

on abstract thinking, general problem solving, mathematical reasoning, scientific and engineering-based thinking, is a good foundation for understanding all about them.

The subject is taught in a specialist computer suite, enabling you to apply the theory and develop your programming skills throughout the course. You can take Computer Science A Level as an alternative to or in addition to Physics.

## Exeter College option

Exeter College is an outstanding post-16 college situated just a few minutes' walk from EMS. EMS students have full access to the extensive resources and facilities of the College and gain a richer 6th form experience by working alongside College students and staff.

Students who have not selected to study Physics and Computer Science can study for one subject out of the many options at the College at AS, BTEC or A-level. In recent years EMS students have opted for Economics, English, History, Music, Art or perhaps Biology or Chemistry to go with Physics and Maths.

Alternatively, you can take an enrichment option from the College's "Extend" programme – such as learning a foreign language, Ecology and Conservation, Game Design, studying for an Arts Gold Award or participating in a Sports and Physical Therapy programme.



04

# How to bridge the gap between maths at school and uni

If you ask past and current students about the highlight of their time at EMS, you'll often hear about the Exeter Mathematics Certificate.

This is the moment when your study here really starts getting into the research, creativity and independent learning you need to embrace when you get to university.



Companies which have provided challenges for the Certificate include:



Here's what the Exeter Mathematics Certificate involves:

## 01 Problem Solve

Exeter lecturers and professors set you a big, demanding problem.

You work in groups to research, crack the solution and present your findings at the annual Christmas Lectures, hosted by Exeter University.

## 02 Real World Challenge

You start working with a major company – such as ATASS, QinetiQ, The Met Office, Apple or Dyson – researching a challenge they set you and presenting your findings in a professional report.

## 03 Research & Develop

Choose between developing further one of the concepts explored in Year 12 or pursuing a piece of individual research. Past topics include "The Science of Skimming Stones", "Developments in Aeronautics", "The Mathematics of Traffic Flow" and "Statistically Engineering the UK Top 40"



05

# Getting out of the classroom

**Broaden your education as well as expose the deep links between all things and Mathematics.**  $\times \times$   
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## The Inspire series

Our 'Inspire' lectures and workshops happen throughout your time at Exeter Maths School. They broaden your education as well as expose the deep links between all things and Mathematics. The programme ranges across the spectrum of Philosophy, History, Politics and Art. Previous speakers, including research fellows, professors and lecturers, have expounded on topics as varied as:

- + **Proof of 1+1**
- + **Time travel for the uninitiated**
- + **Levels of Truth**
- + **The Seaton Down coin hoard**

## Extracurricular

Several clubs and societies exist at EMS, often set up as a result of students' own interests. There are competitions and challenges on offer too – from the Physics Olympiad to the National Cipher Challenge. You can also join friends from Exeter College for an incredible range of sporting and enrichment activities including (to name a few) Ten Tors and DofE, rugby, fitness, surfing, bands, drama and business activities. The Freshers' Fair at the start of the year is a great way to explore the options.

In addition, the School and each faculty at the College run trips and visits, such as the annual ski trip. Many courses involve trips to develop skills and provide experience to support coursework.

In recent years, these have included:

- + **Local fieldwork for geology students**
- + **Court visits for law students**
- + **Trips to Berlin for history students**
- + **New York or San Francisco for film studies students**
- + **Cheltenham races and holiday parks for travel and tourism students.**







I found that 10 Tors was great way to make friends in Exeter College, as there is really no alternative to getting on well when you're stuck in a hailstorm on High Willhays.💖💖👍

## Exeter College

We have extended lunchtimes which enable students to walk to Exeter College, attend their lunchtime enrichment activities and return to EMS in time for their afternoon lessons. Exeter College activities are sometimes after school, but also run during Monday, Wednesday and Friday lunchtimes.

In students' first week at EMS they attend a freshers-fair at Exeter College where they can sign up for clubs and activities. Students can also find details of events on the College portal.

A few of the clubs available:

- + Jiu Jitsu
- + Debating
- + Ten Tors
- + Duke of Edinburgh
- + Model United Nations
- + Jazz Project
- + Basketball
- + Rugby
- + Band
- + Orchestra
- + Badminton
- + And so many more...

There are options to explore at EMS too - although students run many activities, some are teacher-led - you may decide to prepare for and enter the Poetry by Heart competition, or undertake training to complete English Speaking Board exams, or perhaps blow off some steam with our running club!

.....  
"I've really enjoyed debating club and it has given me the opportunity to make friends over at the college in an informal atmosphere. I also have greatly improved my public speaking which was good preparation for my Exeter Maths Certificate presentation and it has even given me the opportunity to go to a competition."

**Ryan, Who participated in Debating Club**

"I've been attending Exeter College Jiu Jitsu for about one and a half years now. I must admit that it has definitely served me well, but not only in my fitness but also for my self-confidence, and the ability to feel safer in a lot of situations. I will definitely continue doing it when I go to university as it is such a great thing."

**Michael, Who participated in Jiu Jitsu**



# Curriculum X

Curriculum X is an extra course offered to students in their second year at Exeter Maths School. We know that your curiosity is not bound by the A-Level syllabus, and so neither are our course offerings. We are able to offer these modules thanks to the generous sponsorship of XTX Markets – you may be beginning to see where we got the name from!

Are you curious about why light appears to travel in a straight line? Are you a fan of pure maths or number theory? Our modules such as “The Nature of Light” and “Continued Fractions” will help you answer these questions and explore your mathematic passions. These modules will challenge you with their rigour, but also stretch your mind to the more conceptual aspects of mathematics. It is the aim of Curriculum X to get you thinking like the mathematicians, physicists, and computer scientists at university and beyond.

Each course is taught by either an Exeter Maths School teacher or a University of Exeter academic. The style of teaching will vary, but in general will include more university styled teaching, so for example courses may be broken up into lectures and problem classes. Typically, you will have a 45 minute lecture and a 90 minute problems class each week. In addition you will have problem sheets to complete so should typically allow an additional 2 hours of independent study time.

## Recent Courses

Some courses will vary each year, whilst others remain core modules. This information will give you a taste of the type of options on offer for each subject area. Students can elect to study up to ten modules (two in the summer term of year 12 and two per half term in the autumn and spring term of year 13):

## Computer Science

- + Ethics in computer science
- + Programming in C++

## Mathematics

- + Limits
- + Computer Aided Mathematics
- + Knot Theory
- + Data Science
- + Interactive Theorem Proving
- + Sums and Integrals
- + Continued Fractions

**Fantastic teaching!**  
**A subject that I took**  
**on a bit of whim ended**  
**up so gripping that I**  
**remember not being**  
**able to do anything but**  
**listen intently.**  $\begin{smallmatrix} \times & \times \\ 0 \end{smallmatrix}$

## Physics

- + The Nature of Light
- + Relativity
- + Signalling
- + Earth- A Physical and Mathematical Introduction
- + From forced harmonic motion to AC Electricity
- + What is a day? – The equation of time and other stories

“The course had great structure, and everything was laid out well, so it made it easier to follow and understand. It was more like a university-style course, but the content was not too difficult, and could be followed well. I feel it was a great experience of more university-style learning whilst still being accessible. I found the course very interesting and would highly recommend.”

Chloe, who studied Continued Fractions



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# Helping you plan your future wherever you're heading

Many people struggle for years to find career that fits. In fact there's rarely a career that is quintessentially "you".

Many of our students will find the career that fits best does not exist yet! So we think it's most important and appropriate that we equip students to be flexible and innovative.

Our curriculum does just that and our careers guidance is interwoven throughout our courses. That guidance naturally has a STEM focus.

Almost all of our students continue on to higher education, either immediately, or following a Gap Year. But it is not all about university progression. In addition to the more academic institutions, we have successfully supported students moving on to accountancy, degree apprenticeships, the armed forces, and some who have chosen to take gap-years or enter the world of work immediately.

Once an EMS student, always an EMS student. We aim to keep in contact with our alumni to assist in whatever way we can. 😊



08

# How we look after students



**At Exeter Maths School  
you're part of one big  
close-knit family. ❤️👩🏫👨🏫**



When you're boldly exploring new horizons in the subjects you love, you need to be confident that you'll be looked after every step of the way. We're small so we all know each other, but we also draw on the very significant support network at Exeter College.

Initially we help you adapt to the unique learning environment at EMS through our induction programme. As a student you have a tutor who meets with you regularly to support your progress, help you with your relationships with your teachers and peers and plot your academic goals. You'll receive information and guidance on varied topics: from university applications and living away from home, to managing workload and personal health.

Your tutor is also the key link between parents, subject teachers, and a whole range of support services including a team of counsellors at Exeter College and a student welfare adviser, who can also help and advise parents on childcare, benefits, attendance, supported housing and emergency accommodation.

## Safeguarding

The safety of all students is very important to us. We have a dedicated safeguarding team, who work to ensure that students are safe in School, at College, and in their personal lives. All students are asked to have their student identification with them at all times whilst on college sites.

## Special needs and disabilities (SEND)

We're committed to meeting the needs of all students to enable them to excel – so that means providing every support we can to students with SEND and working closely with parents and other professionals.

Needs may be physical, emotional, social or cognitive. Essentially if students or parents feel that they may need additional support with accessing any element of school life, we work with them to overcome the barriers. Typically our support takes the form of a four-part cycle:

- + Teachers, tutors and the SEND coordinator assess the needs of every student
- + We work with input from the student and their parents or carers to plan additional support for lessons, exams or elsewhere in the school
- + Teachers, tutors and the support team take responsibility for implementing the plan
- + We review the support on a termly basis.



09

# Weekly boarding for students from further away

Accommodation has helped me to make friends that are like a second family to me.  $\begin{matrix} \times & \times \\ 0 \end{matrix}$

If you're excited by the idea of Exeter Maths School, but you live beyond the range of a practical daily commute, it's worth considering our Weekly Boarding option.

Every year students from North and West Devon, Cornwall, Somerset and Dorset stay over and – judging by the feedback – really enjoy building their independence and learning new skills such as cooking. EMS boarders are guided and looked after by our dedicated pastoral and accommodation tutors who understand

what it's like living in a city away from home. They are brilliant at combining a welcoming and sociable atmosphere with the hard working ethos of Exeter Maths School.

We offer accommodation for students that have a daily commute of more than 1 hour each way. Students are able to live in Exeter from Monday to Friday during term time, going home each Friday afternoon to spend the weekends with their families.

There is a charge for accommodation. We have a means-tested bursary scheme to enable students from all backgrounds to attend the school.





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# Thinking of applying



The EMS admissions process is designed to ensure that the students who enrol are those who will really benefit from our exciting, specialist curriculum. We're looking for enthusiasm and potential – not just strong grades at GCSE.

Precise dates for this year and an application form are available on the website.

**Staff and students that want to collectively achieve greatness.** 

## The key stages are:

### 001 Application

You start by completing in an application form available from the website at the end of September. If you apply by the early bird deadline, you will be invited to a workshop to help you prepare for the entrance test.

### 010 Test

Once we receive your application, we take up references with your school and, if you're predicted to meet the minimum entry criteria, we invite you to sit the entrance test. This is designed to test your ability to solve problems and work mathematically. No specialist preparation is required and you won't need any mathematical knowledge beyond what's normally expected at school.

### 011 Interview

The next step is an interview. Here's where you get to ask questions and work out whether EMS is right for you. A short maths tutorial forms part of the interview, enabling us to get a better understanding of the way you think.

### 100 Offer

We offer conditional places to students.

### 101 Confirmation

As soon as you get your GCSE results, you contact the school. We will get in touch to confirm your place.

## Taster days

If you love maths and you think EMS may be for you, we strongly recommend you come and sample what we have to offer. Our Open Days for younger students and Taster Days for year 11 students give you a chance to meet Staff and students and immerse yourself in the fun (but demanding) maths, physics and computing challenges we are into here. You will also get a true feel of the unique, informal atmosphere at Exeter Maths School.

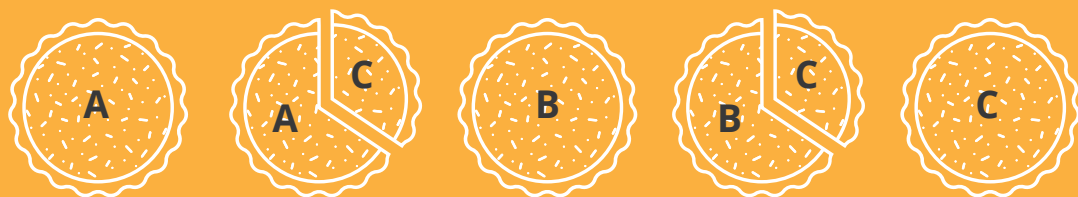


11

# Crumbs!

## Can you solve the problem?

Three people are going to share five cakes equally. They want to do it so that the smallest piece that anyone receives is as large as possible. One way to share the cakes is as follows:



This way A and B each receive a whole cake and a single piece being two thirds of a cake, but C receives a whole cake and two smaller pieces each of one third of a cake. So the smallest individual piece that anyone receives is one third.

Find a way to share the five cakes amongst the three people so that the smallest piece anyone receives is larger than one third.

**Can you find the best solution?**

The highly stimulating environment you all work so hard to provide, enabled our son to achieve his full potential and for that we are extremely grateful. ^.^







For more information on applications and taster days, please go to:  
**[exetermathematicsschool.ac.uk](https://www.exetermathematicsschool.ac.uk)**

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