



more maths grads
multiplying opportunities

newsletter

Jan Feb Mar Apr May Jun Jul Aug Sep Oct Nov Dec

Project Manager Makhan Singh finds the resolution in More Maths Grads

The New Year is here and with it comes the custom of making resolutions. I have always been curious to know why people make resolutions at this time of the year. It is even more fascinating to think about which resolutions we maintain and which we break.

However, I found an interesting definition of the word 'resolution' on the internet. It said: "Resolution = finding a solution to a problem".

For me, that summarises the More Maths Grads project. Our passion to drive and seek out solutions has been truly awesome. All those who have been involved in the project have made many, many resolutions, finding solutions at both the micro and macro levels. And although 2008 was an amazing year for the project, I sense that 2009 is going to be even better!

But there is another aspect to resolutions which I think is important to the More Maths Grads project. Resolutions can only be maintained with the encouragement of other human beings. Whether it comes from work colleagues, friends, soul-mates, family members or even a child, encouragement and teamwork are the vital ingredients for any form of success. Teamwork has been the strongest ingredient in our project.

And with the support of teamwork comes something else, which

has played a key role in shaping the project – the strength and ability to take on board constructive criticism. Wherever it has come from, whether from the mathematics community, or the wider science community, the More Maths Grads team has shown how great work can be accomplished by good listening, encouragement and active empathy. The team's capacity to work together to find the best possible solutions has been a truly inspiring feat.

So as I sign off from our New Year edition, I would like to share with you something my trusted personal assistant, Melanie Ashfield said to me which has helped me stay on track of my New Years resolution: "Only make a promise if you can keep it!"

Truly wise words indeed to take us into 2009. Happy New Year to you all!

Makhan Singh
National Project Manager
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Clock those thumbs!
Rupali Vyas, Makhan Singh and Melanie Ashfield

Regional Roundup

East London



Makhan, regional project director Prof Peter McOwan and project officers Vivien Easson and Ruth Holland network with Minister of State for Higher Education and Intellectual Property, David Lammy MP

In December, the East London team was in Parliament, meeting 200 politicians, NASA space scientists and school students.

More Maths Grads joined up with two public engagement groups from Queen Mary's, London (CS4FN and Cassini Scientist for a Day) for the 'Magic of Space' event at the House of Commons. MPs Ian Taylor and Bill Olnier spoke and star guests were father and son astronauts Owen and Richard Garriott. Owen was an astronaut for Nasa, while his son Richard was a successful entrepreneur in the computer games industry, eventually becoming the sixth space tourist, paying his own way on a trip to the International Space Station.

The winners of the Cassini Scientist for a Day competition came to the

reception to meet the astronauts. The competition, run jointly with NASA and the Ideas Foundation, gets 11-18 year olds to compete for a chance to direct the Cassini satellite currently orbiting Saturn and choose what to investigate and photograph.

CS4FN has launched a free Magic of Computer Science e-book which can be downloaded from www.cs4fn.org/mathemagic/. It is a collection of mathematically magic card tricks to entertain and educate – the idea being that mathematics behind the tricks will also be something core to computer science. They are easy for teachers to do and the mathematics behind the tricks is explained fully.

The QMUL student ambassador scheme, which is run as a module for

final year mathematics students, has got underway. Students are selected by interview, then Zia and Vivien pass on all our knowledge to this future generation of teachers.

Finally the much anticipated (by us anyway!) DVD resource for GCSE maths nears completion. There is some great footage with interwoven resources and a topic-by-topic introduction by Professor Marcus du Sautoy. Aimed at higher tier GCSE students, the DVD is being produced in conjunction with structural engineers Walsh Group; automotive, transport and energy engineering group Ricardo; and Weatherquest, a private weather forecasting company. More soon...

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Yorkshire and Humberside

We get lots of correspondence in the Leeds office, but something arrived recently which made us stop and think about the impact of the project.

Some Year 10 students from Brighouse High School, a specialist school in business and enterprise in West Yorkshire, visited Leeds University in November. They wanted to share their experiences with the rest of their school and wrote a newsletter describing what they had done. Reading it reminded us of the power of the project to transform young people's opinions.

The effect of meeting the undergraduates was particularly evident. The pupils had seen students enjoying maths at degree level, whilst at the same time making the most of university life. This led to comments such as 'gave me a reason to do maths' and 'encouraged me to take higher maths'.

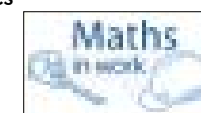
Knowing this, we have invested time in recruiting maths undergraduates to visit schools. In Leeds, we have nearly 35 student ambassadors. And at the recent joint conference of More Maths Grads and the NCETM (National Centre for Excellence in the Teaching of Mathematics)

in Manchester, we focused on raising awareness of the schemes so that more pupils can benefit from this contact with undergraduates.

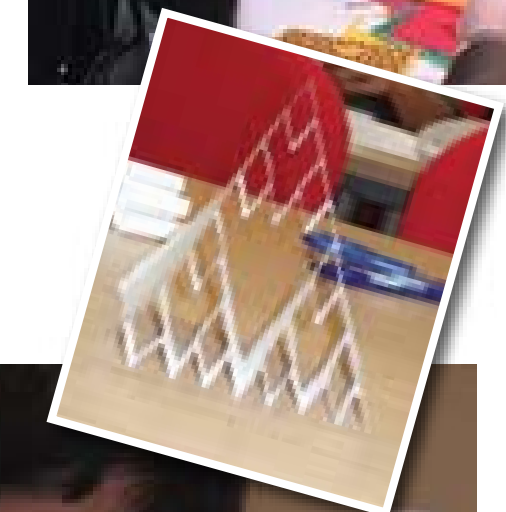
We aim to bring real life examples of successful people who use mathematics into the classroom. Pupils need to see that mathematics can take them to interesting and exciting places - and they need role models who they can identify with.

The NCETM Maths in Work webpages are a great way to do this. They feature 32 video clips (developed with More Maths Grads) of the diverse uses of maths in the world of work. Ordered by curriculum topic, the collection is a powerful resource in teaching functional maths or showing pupils the relevance of maths in the workplace.

Go to the following page and click on the image below: <http://www.ncetm.org.uk/resources>



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Ruth Holland • r.m.holland@leeds.ac.uk



Pupils from Brighouse High School learning about the mathematics of fractals

Looking for more maths resources with added motion?



Regional Roundup

West Midlands

We thought the run up to Christmas was busy, but looking ahead, the New Year looks like being even more hectic.

On a chilly December day, 150 students and members of the public came to Coventry University to hear Lord Hunt, Honorary Professor of Mathematics and Professor of Climate Modelling at University College London. In a lecture entitled "Patterns and Predictions of Weather and Climate", Lord Hunt highlighted the use of mathematics in unravelling some complex mysteries of weather systems.

We will have another public lecture on 10 March 2009, during National Science and Engineering week, when Dr David Acheson, emeritus fellow in mathematics at the University of Oxford will speak on "Mathematics, Magic and the Electric Guitar".

We believe that exposing school students to the reality of studying



Ewan shows 'em how it's done at the Connexions Annual Career Fair

the expectations of student ambassador placements, so the students left feeling informed and inspired to start work in a selection of schools across the West Midlands. So far, five student ambassadors have started their placements.

We really enjoyed the Connexions annual careers fair, which was held in Coventry at the Herbert Art Gallery – a local arts centre which has just been redeveloped. Visitors to the More Maths Grads stand were often surprised by the diversity of career opportunities that we had on display - we were delighted to be able to tell them where a mathematics degree can lead. We also managed to corner a mathematician based in the unlikely location of Stratford-upon-Avon (see the Career profile on page 8).

mathematics at university is a powerful way to break down the preconceptions that may be holding them back. So in early January, we held a student overview, from a school's perspective, of

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More Maths Grads sets the puzzle!
Pupils at the Connexions Career Fair held at the Herbert Art Gallery, Coventry



Curriculum News



Neil Challis and his team's research take him to some weird and wonderful places!

Coming soon - articles near you

The first two articles in a planned series are shortly to appear in the MSOR Connections newsletter (www.mathstore.ac.uk). The first looks at the ways we support our students, while the second explores the ways in which they engage with the materials and activities of their course, through lectures.

Next in the series are articles on:

- the best use of tutorials
- skills
- careers awareness at undergraduate level

Routes into Higher Education

The difficulty of getting students up to speed to begin mathematical sciences degree courses from non-traditional routes is not new. In the late 1970s, the Institute of Mathematics and its Applications developed a course called Polymaths, in conjunction

with a group of then polytechnics (led by Coventry) and further education colleges. The course got students up to A-level standard and was taught in the evenings on a part-time basis.

Although Polymaths courses have ceased to exist in most new universities, two HE institutions (Bolton and Liverpool John Moores) are finding that they provide a worthwhile route into HE for a viable number students. Thank you to colleagues at these institutions who have taken time to talk to us about this, helping us to analyse what Polymaths has to offer in comparison with the more common university prep years and access courses. Prep years vary in their mathematical focus from approximately 50% mathematics, down to about 20%. The economics of running access courses usually means that the mathematical content is nearer to the 20%

figure. The more general courses however can offer more options when it comes to choosing university study. We are looking at this in more detail in an article to be submitted shortly.

Foundation Degree

Consultation is proceeding with employers via SEMTA (the Sector Skills Council for Science, Engineering and Manufacturing Technologies) and placement-year contacts about the nature of a possible Foundation Degree in Mathematics with Business. A proposal for consideration is that the degree is approximately two thirds highly practical mathematics and one third business awareness, with a significant work-based learning component.

More Maths Grads on YouTube
Go to www.youtube.com and type in "more maths grads"



Welsh Project

Onward and upward - More Maths Grads spreads across the border!

This month, we have been celebrating a new development for the More Maths Grads project. After winning a successful bid with the Higher Education Funding Council for Wales (HEFCW), we have established a project team in Wales to expand the mission across the border.

The new branch of the project will develop a range of maths teaching and careers resources in Welsh (Cymraeg) to mirror those in English and make them available to all secondary schools to increase engagement.

Although the Wales project will be on a much smaller scale than its English partner, we will still aim to build partnerships and relationships with schools, employers and local education authorities across the region.

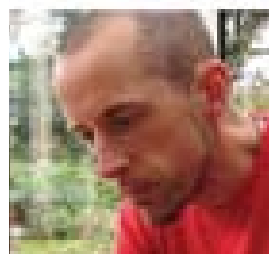
We hope these partnerships with secondary schools and local employers will enable pupils in Key Stages 3, 4 and 5 to understand the use of maths in industry and commerce. The schools

will also get a chance to visit a Higher Education Institution with the aim of raising aspirations of the pupils. The schools will be asked to divide their pupils into teams and produce case studies based on their experiences at the HEI. These will be presented at a final exhibition this July, where there will be a prize ceremony.

We would also like to extend a warm welcome to the three new members for the More Maths Grads team.

Welsh region project officers Tim Watt-Soar and Stephen Bush are based in the north and south of Wales respectively. Tim and Steve are already working hard to make links with the various organisations. Rupali Vyas is co-ordinating the Wales project and is based in Birmingham, where she is also supporting Makhan in the England project.

We are very excited about this project and foresee it being very successful!



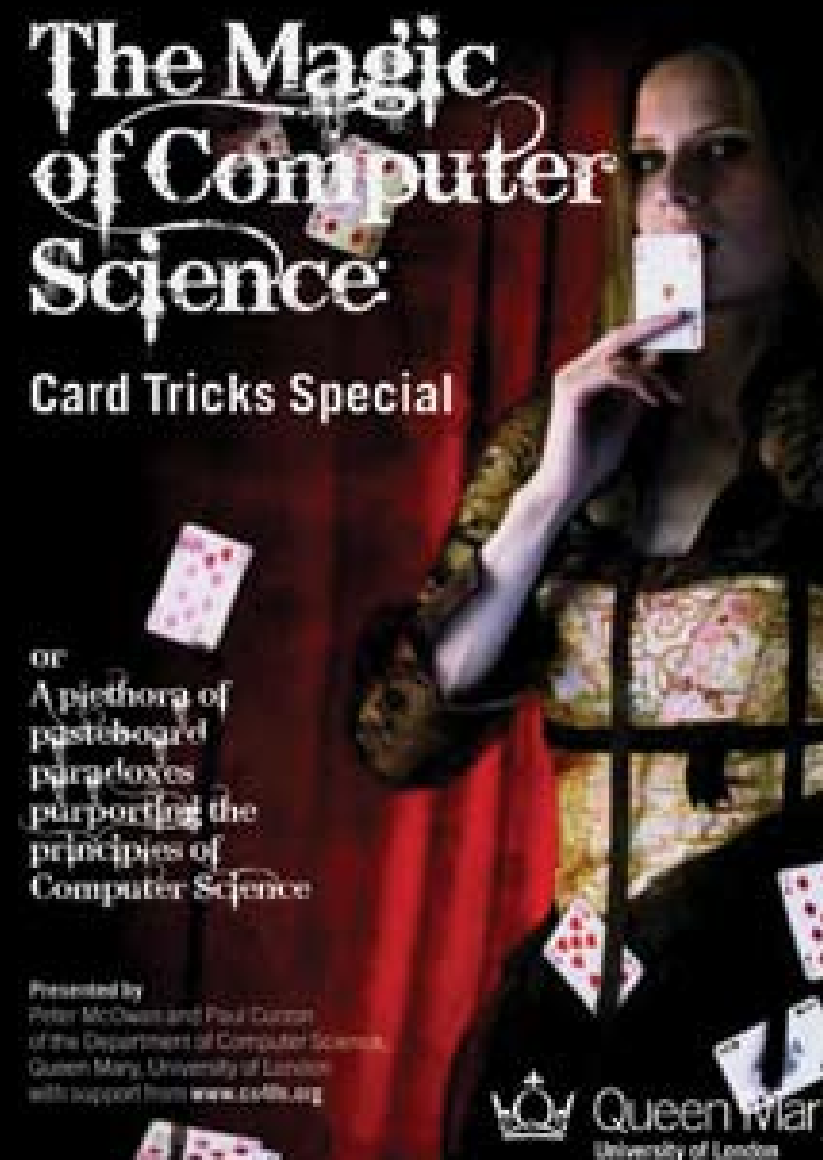
New faces:
Project Officers Tim Watt-Soar (top), Stephen Bush and Rupali Vyas



Makhan takes his Welsh recruitment drive to the road - beginning in Llangollen!

The Mathemagician

More Maths Grads' Professor Peter McOwan lays his cards on the table



Queen Mary, University of London's award-winning outreach project, Computer Science for Fun (cs4fn) launches its free online e-book 'The Magic of Computer Science', this month. It will be available for free download from www.cs4fn.org/mathemagic/ from today (Monday 26 January) where you can also find more cs4fn mathemagical tricks.

The book is a collection of easy to do mathematically magic card tricks to entertain and educate people of all ages. The twist is that every trick teaches you something about the maths underlying computer science.

Professor Peter McOwan, co-creator of the cs4fn project, explains: "The tricks in the book are all based on clever mathematical principles. In fact the same mathematics that makes each trick work also lies at the heart of a core computer science concept or an important computer application.

"One of the mind reading tricks in the book uses the same maths as one kind of the main kinds of medical scanner. While learning about how to do the trick you also learn about the computer techniques that allow doctors to see 3D images of the brain."

The book will also be available via

the website of the National Centre for Excellence in the Teaching of Mathematics (NCETM). Sybil Cock, London Regional Co-ordinator of the NCETM hopes the book will prove a valuable resource for Maths teachers. She commented: "This booklet provides some brilliant ideas for livening up Maths lessons. The tricks are not hard for a teacher to use, and the booklet shows you exactly how to use the mathematics behind the tricks to amaze your students. Every Maths department should have one!"

Makhan commented: "One of the wonderful things about mathematics is that it has the power to demistify, helping to bring understanding, reasoning and answers. Magic is just one of those fields and it's a great way to engage young minds and hearts in understanding the power of maths."

The book launch kicks off a busy year for the cs4fn team, who will be touring their Magic of Computer Science road show around the UK throughout 2009 at science festivals and events including the Royal Society's Summer Exhibition.



Hey Presto! Peter McOwan, East London regional director for MMG

The cs4fn team is supported by the Engineering and Physical Sciences Research Council (EPSRC), Google, Microsoft, ARM, and MoreMathsGrads.

Career in Profile: James Connell (Morgan Professional Services)



James Connell works as a Civil Engineer at Morgan Professional Services, a design, engineering and project management business. He uses mathematics in the design and construction of buildings and is based in Stratford-upon-Avon.

What is your background in mathematics?

I enjoyed maths at school, particularly the mechanics which I studied at A-level. I originally thought I might become a pilot in the Royal Air Force, but decided to find out about some other options. I had some idea of what a degree in engineering involved, as my brother studied it when he went to university. I investigated which degrees and careers would suit my interests and chose a degree in Civil Engineering at Oxford Brookes University. I really liked the idea that I could find out how buildings worked and I knew that I would use my maths. I

was right and found that there was a lot of maths involved. In particular, topics such as statics, dynamics and structural mechanics are very important in designing and building structures.

Did you have any difficulty finding vacancies while job hunting?

The great thing about my choice of degree is that a career was already clear for me. I already knew when I was doing my degree where I wanted to apply my mathematical skills. I was fortunate that my degree course included an industrial placement year, which gave me valuable experience in the world of work. I was mostly based on site with the site manager and used a lot of maths in calculations. After I graduated, my interests moved into working as a consulting civil engineer.

What skills do you use in your job?

As a consulting civil engineer at Morgan Professional Services, I liaise with a client and plan, manage and supervise the construction of projects. A contracting engineer oversees the actual construction work on site. For me, consulting is where the more challenging maths work comes in. An architect will come to us with their concept for the design of a building. Our job is to analyse and design the structural components; consider the overall structural stability and integrity of that building; and provide a safe and viable solution so that the concept can be turned into reality. We use a lot of mechanics to be sure that

the plan for the project can be realised. There are many other skills that are very important in my line of work. For example, I need to communicate my findings to colleagues frequently, so good social skills are good to have. Additionally, I have to use some project management skills when I am directing a team of colleagues on specific tasks.

Has your perception of mathematics changed in moving from an education environment to the world of work?

When you are studying in school, you don't always see the wider context of what you are doing. But when I use maths at work, I get to see the finalised building and there is great satisfaction in knowing that I played a big part in its construction.

To find out more about Morgan Professional Services, visit the website: www.morganps.com

Many universities offer modules and courses in the mathematics behind James' work. These will typically come under the heading of "Structural / Civil Engineering"

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and **WIN** a Digital Camera!!

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in working out
the pattern in
the structure
of a song!

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boots and **blast** maths
into the back of the
net - if you can!

BEAT THE GOALIE



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mathsville

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committed in the
sleepy town of
Mathsville - but
who did it!?!

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test!

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The Inspirational Corner

Makhan gets into gear and finds that maths has the power

It was a wonderful and inspiring moment when I had the chance to meet the world land speed record holder Andy Green at the film shoot for our More Maths Grads careers DVD.

It was a great privilege meeting someone who has not only chosen to test the limits of speed and sound, but who also has a passion for maths.

Wing Commander Andy D. Green OBE is a British Royal Air Force pilot having gained an RAF scholarship to Worcester College, Oxford, where he graduated in 1983 with first class honours in mathematics.

He is the current holder of the World Land Speed Record, and the first person to break the sound barrier on land. On 25 September 1997, in the British-designed ThrustSSC he beat the

previous record in Black Rock Desert, USA, reaching a speed of 714.144 mph (1149.30 km/h). On October 15 1997, exactly 50 years and one day after the sound barrier was broken in aerial flight by Chuck Yeager, Andy Green reached 763.035 mph (1227.99 km/h), the first supersonic record (Mach 1.016).

A truly amazing and inspiring soul – who says maths can't be fun!



Zooooooming stuff! Makhan with the great Wing Commander Andy Green OBE

CAPTION COMPETITION

Winner of last month's caption competition is Anita Virk who sent us the excellent caption: "Yes, I am the most handsome one today!". A £10 gift voucher goes to Anita for sending in the funniest caption.

This month we have More Maths Grads officers Ewan & Farzana living large - but what are they saying?

Think of a caption and email it to the MMG newsletter HQ c/o: m.ashfield@bham.ac.uk

The funniest caption will win a £10 gift voucher and be published in the next edition!



Mathematics, Magic and the Electric Guitar

by Professor David Acheson, University of Oxford

Date: Tuesday 10th March 2009

Time: 6.15 - 7.15 pm

Refreshments from 5.30 pm

Audience: Students (GCSE/AS/A2), teachers, parents and members of public

Admission: free

Venue: Goldstein Lecture Theatre
Priory Street, Coventry University CV1 5FB
Places are limited.

To book your place
email: aa4015@coventry.ac.uk

Phone: 024 7688 8569

Fax: 024 7688 8199

CRAC: The Career Development Organisation



Maths teachers Teresa and Sam from Archbishop Ilsey College meet Emma (centre) from CRAC

More Maths Grads will be working closely with CRAC in 2009 to develop workshops that will empower both maths teachers and careers advisers with maths related careers resources – so what is CRAC?

CRAC is an independent charitable organisation dedicated to career development and active, career-related learning. CRAC have a passionate belief that individuals have the ability to achieve their career goals if they are equipped with the skills to do so.

CRAC's aims are:

- to support those who help people make career decisions with up to date knowledge of career pathway options and resultant decision making
- to support employers in their understanding of national education and skills policies and their development of career-related learning programmes
- to support career development for specific sectors, industries, age or educational groups.

CRAC has a vision of a world where people make career decisions wisely and develop their capabilities throughout their working lives.

www.crac.org.uk

MATHS PUZZLER

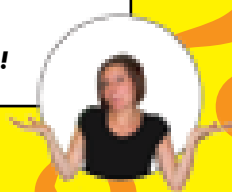
To mark the special occasion of the first More Maths Grads Newsletter of 2009, Dr Alan Slomson from the University of Leeds has contributed this timely problem.

Can you get the year to add up?

$$2007 = 1 + 2 \times (3 \times 4 + 5) \times (6 \times 7 + 8 + 9)$$

Similarly, can you write 2009 using the digits 1-9 in order and the basic operations $+$ $\times$ $-$ $\div$ $?$ You may also use brackets.

Answers by email to Melanie Ashfield:
m.ashfield@bham.ac.uk - **WIN A £10 GIFT VOUCHER!**



Diary Dates

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feb - mar 2009

11 February

- WEBP Careers for U, for Yr 9, Trinity School Leamington

20 February

- Yr 12 Focus Group, Coventry University

4 March

- Enriching Mathematics, Queen Mary: Year 8 students from Tower Hamlets
- WEBP, Real Context problem solving Challenge, Kenilworth School, Coventry

7 March

- Pop Maths Quiz for Year 7 & 8, Leeds University
- Popular Maths Lecture: 'Taking Maths from the Classroom to the Real-world', Leeds University

9 - 13 March

- Leeds Festival of Science, Leeds University – including various mathematical activities

10 March

- Science week public Lecture: "Mathematics Magic and Electric Guitar" by Professor David Acheson, Coventry University

11 March

- 'The Maths of Search Engines and Video Games', by Richard Lissaman from the FMN, Leeds University

13 March

- 'Making the grades' a conference for Year 11 students to help secure grade C in mathematics, Ricoh Arena Coventry

18 - 19 March

- Skills West midlands, Ricoh Arena Coventry

23 March

- Mystery at the University - a Maths Whodunnit for KS3, Leeds University

23 - 27 March

- Leeds Festival of Science, Leeds University – including various mathematical activities

24 March

- Yr 10 Real Context Problem solving Challenge, Trinity school, Leamington

26 March

- Maths at Work Day for Year 10, Leeds University



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For more information about the More Maths Grads project or for general enquiries please contact
info@moremathsgrads.org.uk