

## Maths for holidays

Aaron Sugarman is the Head of Operational Research at TUI Travel in Luton. His team uses mathematical techniques to find working models and solutions of various organisational problems within the company.

### What is your background in Mathematics?

I always liked Maths at school but for a while I thought it would be Chemistry which I went on to study at university. I realised that I was enjoying solving chemical equations more than the other material and my passion for Maths grew from there. I did my undergraduate degree in Mathematics at Oxford and then I did a Masters degree in Operational Research at the University of Warwick.

### What's your career history?

During my time at Warwick, I completed a three month placement at Natwest where I was looking at how applicants for new accounts are chosen based on past credit. I went on to work for a management consultancy company for two years. During that time I did a variety of interesting work. This included scheduling production for the Ford Mondeo, looking at the effectiveness of the supply chain at Marks & Spencer and also the effectiveness of the Trainline call centre.

### What are some examples of typical tasks in your job?

Operational Research is basically applying analytical techniques to solve organisational problems such as scheduling, optimisation etc. and looking at efficiency of various procedures. One typical task here is forecasting holiday demand. In order to do this, we look at trends in historical and recent data across different variables, for example the seasons. We then carry out an optimisation of demand against capacity. This leads us to the price which we should charge for the holiday which will be best for the company in terms of profit.

## Has your perception of Mathematics changed in moving from an education atmosphere to the world of work?

I think one of the most important things to learn quickly in my job is being able to decide what is important and what is not and working to a deadline. There is always a new challenge and a constant supply of fresh problems which require new models to be developed. With Operational Research you are not stuck within one field and that keeps the job varied and exciting.

### What skills do you use in your job?

I think that the most important skills required are problem solving ability and communication skills. In terms of problem solving, it is important to be able to clarify objectives, understand a problem and model the factors involved. Equally, it is important that you are able to communicate results and make others understand the ideas.

### Do you have any hobbies?

I did like rugby when I was younger but lately I have been playing a lot of five-a-side football. I also have a six month old son who keeps me pretty busy!

To find out more about TUI travel, visit the websites [www.tuitravelplc.com/tuitravel](http://www.tuitravelplc.com/tuitravel) [www.thomson.co.uk](http://www.thomson.co.uk) [www.firstchoice.co.uk](http://www.firstchoice.co.uk)

If you like the sound of Aaron's job you will need to study modules or courses that come under the heading of 'Operational Research' or 'Optimisation'.

RELEVANT CLASSROOM MATHS:  
Statistics, Probability, Decision Maths



'I can work across a variety of exciting fields.'

## Inspiring future generations

Sara Santos is a Clothworkers' Fellow working at The Royal Institution of Great Britain in London. She supports a UK-wide network of Mathematics Masterclasses for secondary school pupils.

### What is your background in Mathematics?

I originally wanted to be a painter or architect when I was younger but I found myself becoming more and more interested in Mathematics, particularly when a great teacher encouraged me to take my Mathematics studies further. I did my degree in Mathematics in Porto, Portugal. Then I got an offer to come over to Manchester to do a PhD in Dynamical Systems.

### What's your career history?

During my PhD studies I was also fortunate to be able to do some lecturing and teaching. I became involved with a program at Manchester where we would take fun science puzzles and workshops to children from deprived areas. I felt like I could really make a difference and that feeling really warms your heart. From there, I was involved with various science communication projects and then I got this fantastic job at The Royal Institution.

### Can you tell me about your current job?

The Royal Institution of Great Britain was founded over two hundred years ago. Its main aim is to connect people with the world of science. Our most famous scientist is probably Michael Faraday, father of the Theory

of Electromagnetism. One of our most popular events are our Christmas Lectures. We also offer the public family fun days and talks from renowned scientists. We run a UK-wide network of Mathematics Masterclasses for school children willing to give up part of a Saturday morning for some fun Maths. In these sessions we give the children background to a problem and then they work through it in groups. The children are encouraged to discuss their work and we like to emphasise the links between Mathematics and other subjects, such as Art. We try to make clear that there is not always an explicit right or wrong answer in Mathematics.

### What skills do you use in your job?

You need to have a good sense of what will appeal to a young generation. There is a lot of creative thinking involved. We collaborate with a lot of mathematicians working in industry and at universities so we need good social networking skills too.

### Do you have any hobbies?

I think it's important to exercise your body as well as your mind so I like to do some sports. In particular I like to do Capoeira which is a form of martial art combined with dance.



To find out more about the exciting work done by The Royal Institution, visit the website [www.rigb.co.uk](http://www.rigb.co.uk)

'It really warms your heart when you see that you are making a difference.'

To explore more exciting opportunities available with mathematics see the websites; [www.mathscareers.org.uk](http://www.mathscareers.org.uk) [www.moremathsgrads.org.uk](http://www.moremathsgrads.org.uk)



# Mathematics Career Opportunities



**more maths grads**  
multiplying opportunities



# X your career opportunities with mathematics and + valuable skills for a bright future

## Saving Lives/Helping to fight disease

### Arden Cancer Centre, Walsgrave Hospital Coventry



'The centre is primarily concerned with the treatment of cancer. My job is to ensure that patients are treated correctly with radiation and I research the use of high intensity radiation beams to treat

tumours. I think that one of the attractions of my area is that the maths is very applicable to real life situations and patient care.'

Kevin Young

## Making People Safe

'You need to be able to make others feel confident in the results which you present.'

Katherine Byrne

'I always loved Maths, particularly problem solving. I think there is something exciting about understanding a problem and working hard to solve it.'

Jo Keefe

To find out more about the exciting work done by The Home Office Mathematicians, visit the website [www.homeoffice.gov.uk](http://www.homeoffice.gov.uk)

## Consultancy

### Hartley McMaster



'There are more varied applications of Maths in the real world than I imagined when I was at school. For example, maths is used in the airline industry to plan flight schedules, in the retail industry to work out what products customers want, when and where they want them and how to distribute products in the most cost-effective way. Maths is used in all customer-based industries to formulate trends in business and the Government needs to analyse data, to review how effective its policies to treat offenders are for example.'

Heather Wright

## Operational Research (O.R.)

### British Airways

'We do a fair bit of work on the front of house operations at Terminal 5 through the construction of simulation models. These help to make decisions on things such as equipment and manpower. We also analyse sales and revenue data and also look at methods of improving scheduling. Maths has a real context. When you can clearly see the work we do here impacting on the company you feel like you're making a real contribution.'

Eoin Igoe & Sarah Coulson



## Exploring the hidden secrets of Earth

'I'm the only one here who can do what they need'

Brian O'Connell works at TGS NOPEC in Kingston Upon Thames in London. He is an Analytical Geophysicist and his work uses Mathematics to help to understand the Earth.



### What did you want to do as a job when you were younger?

I actually first wanted to be a weather forecaster. I found it really interesting that it could be possible to predict what the weather would be like the next day. I wondered how they did it. I was always interested in how the Earth works.

### What did you enjoy about Mathematics at school?

I liked knowing that something was definitely correct and that I knew when I had done a good job. There was a satisfaction in that.

### What is your background in Mathematics?

I did a lot of Maths and Physics at school and I continued that at university. Towards the end of my degree I did a project on the relationship between Maths and Music. I looked at the attenuation of various frequencies occurring in Music. My PhD was concerned with analysing high frequency seismic traces.

### What's your education and career history?

I got my undergraduate degree in Ireland and I put in a lot of studying to get a great degree. I studied fairly intensively in a room with my 'Study Cat', it was always by my side. I did a PGCE teaching qualification in Swansea because I was advised that my studies would be financed as teachers with my expertise are in high demand. After that I took some time out to travel the world. I have lived just about everywhere; New York, Madrid, you name it. My sister lives in Australia so I spent some time there. I have had some quite varied jobs in my time. I have worked behind a bar in Irish pubs. I worked on a building site in Southampton. And I even worked in a Chemistry lab testing yoghurt in Brisbane! Eventually I applied for a job at TGS NOPEC in Houston,

Texas and ended up getting my current job in the London branch.

### How do you think your Mathematics background helps you in the day to day aspects of your job?

My current role at TGS NOPEC is as an analytical geophysicist. The company has a strong focus on trying to find hydrocarbons such as oil and gas. Mathematical equations are used to carry out the seismic analysis. I'm the only one here who can do what they need. In this job you apply mathematical formulas to real life.

### Did you have difficulty finding vacancies while job hunting?

Maths is a shortage subject and there are a lot of jobs out there. There are going to be jobs anywhere I go. Everyone needs a phone, everyone needs oil. I'm basically using Maths to travel the planet!

### Has your perception of Mathematics changed in moving from an education atmosphere to the world of work?

Definitely. When you move into a work environment it's a much bigger deal because there are often time schedules and money at stake. It's been a huge learning experience but I know that my background in Maths will ensure that I am well equipped for what's next.

### Do you have any hobbies?

I used to play the drums a lot. I was in a band and we even played some gigs on the same bill as Ash and Oasis. The neighbours definitely know if I am back at home because they hear the drums! I have also done a bit of modelling during my PhD and I did a bit of salsa dancing too. I love rugby and watch it as much as I can.

To find out more about the TGS NOPEC, visit the website [www.tgsnopec.com](http://www.tgsnopec.com)

If you like the sound of Brian's job, you will need to look for modules and courses under the heading of 'Fluid Dynamics / Mechanics' or 'Magnetohydrodynamics'.

RELEVANT CLASSROOM MATHS:  
Vectors, Differentiation, Integration

## Predicting the future



'I wouldn't be where I am without Maths'

Fayeazah Sayed works at KPMG and is based in Leeds. She is a trainee actuary.

### What did you enjoy about Mathematics at school?

I liked the feeling that there could be a right or wrong answer and that it was challenging. I also liked doing a subject with a lot of applications in the real world.

### What is your background in Mathematics?

I always did Maths because I enjoyed it. At school I did A Levels in Maths and Further Maths. My parents wanted me to do Medicine at university but I convinced them that I really wanted to do maths because it was the subject which I loved. My parents were worried about the job prospects with a Maths degree but, after doing some research, I found that there were a huge number of options with a background in Maths. I went on to do a degree in Mathematics from the University of Leeds. As I went through my undergraduate degree, I found myself being more interested in Applied Maths than Pure Maths. I graduated from Leeds with a First Class Honours degree in Maths.

### What's your career history?

I worked part time in admin for Topshop while I was doing my degree. My duties were mainly to do with the finances. I got my current job as a trainee actuary at KPMG after I graduated. Actuaries basically look at the profits and losses of a company and use Maths to predict the financial future of the company using lots of calculations and graphs.

### Did you have difficulty finding vacancies while job hunting?

I did a bit of research into what options were available while I was doing my degree. I went to the university careers service and also to various careers fairs to get more information. I was using a few online sites in addition to this. There was a bit of competition for jobs but employers know when you are genuine and when your passion for the job is there. My passion for Maths definitely played a big part in me getting my current job.

### Has your perception of Mathematics changed in moving from an education atmosphere to the world of work?

It has been a bit strange but very interesting. Actually seeing the application of the Maths which I learned in my degree has been great. There is a lot of flexibility with my job too. I can choose to switch office location if I want to.

### What skills do you use in your job?

I obviously use a lot of Mathematical skills however I also need to use a lot of my social skills. I need to be able to explain complicated theories to a wide range of people. There is also a lot of team work involved in my job which makes a nice informal working atmosphere.

### Do you have any hobbies?

I did a lot of kickboxing at university. I also enjoy swimming, badminton and films. One of my main interests is Art. I have done a lot of painting and I like to make photo frames and Christmas cards and things like that.

To find out more about KPMG, visit the website [www.kpmg.co.uk](http://www.kpmg.co.uk)

If you like the sound of Fayeazah's job you can look for modules or courses under the heading of 'Financial Mathematics'.

RELEVANT CLASSROOM MATHS:  
Statistics, Probability