

The end of a very busy and successful year seems an appropriate time to give a flavour of some of the opportunities that we — as the Mathematics Department — have endeavoured to provide for our students. We hope that, through these, our students have been extended mathematically, encouraged to think ahead about their choices and careers and simply helped to develop an appreciation of Mathematics that is not necessarily related to curriculum and exams.

## MATHEMATICS IS YOUR FUTURE!

On June 25, 2010, a group of mathematicians in Lower 5 attended a one-day conference for able Mathematics students from schools and colleges in Devon and Torbay, which took place at Exeter University. The aim of the day was to show that Mathematics is fun, challenging and essential for a multitude of careers. By the end of the day, many students realised that by studying Mathematics at A-level, they will have gained a valuable passport to a range of exciting university courses and inspirational job opportunities. The conference included a most interesting and fascinating talk on Maths with Bubbles: amazingly, the Mathematics behind bubbles can be found in nature – a fly’s eyes or a honeycomb – but also in a variety of disciplines such as Architecture. The

“bubblers”, Professor David McMullan and Dr Martin Lavelle, were extremely entertaining and had a great sense of humour: this appears to contradict most people’s perception of mathematicians ... There was also a series of stimulating workshops looking, for instance, at a number of simple classroom ideas and exploring their dramatic and far reaching consequences for our daily lives and understanding of our world. How Maths is used to compare different genomes – how it helps us understand how species evolved and determine the difference between us and our closest relatives – was also part of one of the workshops. Emily Daugherty said, “I spent most of the day with my jaw dropped, particularly during the bubble lecture. I also loved the code-breaking session when I got to be a volunteer, the gift cube was a nice touch!” Georgina Rogers said “Everything was amazing: we were very lucky to be picked! I loved the Genome Mathematics.” Beth Watkinson said, “I thought the Mathematics Roadshow puzzle-solving workshop was the best. The day was really good and worthwhile.”



## LET MATHS TAKE YOU FURTHER!

On June 28, 2010, a group of our Lower 6 Mathematics students attended a one-day event, organised by the Further Mathematics Network and the University of Plymouth. The programme of the day included two lectures and ten workshops – ranging from predicting customer behaviour and buying patterns, using Mathematics when responding to emergencies, encryption and Internet security and the Mathematics underpinning molecular modelling – out of which students could choose two that would suit best their current interest and future careers. In the first lecture, “Careers with Mathematics,” a financial advisor, a credit risk analyst and an adventure racer joined forces with University lecturers to discuss how studying Mathematics and Statistics helped them in their careers. The second lecture, “Let Maths take you further!” introduced the students to the wonderful world of complex numbers. These are some of our students’ comments. “It was interesting to see how waves and tidal energy can be tested using machines; I had no ideas what a wide range of jobs uses Maths”. “Sitting in the Dome Theatre was really fun, particularly visualising space as it actually felt as if you were there!” “The plenaries were good because they showed the possibilities of jobs.” “Mathematics and Electronics: great fun to build the electronic oscillator and satisfying seeing it work.” “The talk from Maria Leijerstam on her variety of jobs, balancing her career and social activities, was very inspirational.”



## ROYAL INSTITUTION MASTERCLASSES



At the start of the year, members of Upper 4 were offered the opportunity to attend the Royal Institution Mathematics Masterclasses at the University of Exeter. These classes are designed to encourage students to take a greater interest in Mathematics and to stimulate their enthusiasm for

the subject by introducing topics not normally covered in school, through a mixture of lectures and workshops. The classes involve a considerable commitment as they take place on Saturday mornings, January to March. Jazmine Bailey and Georgina Rutter took this opportunity and this is what they told us, "When we first heard about the masterclasses, we were a bit unsure about them. It was after we heard one of the older girls in L6 (Alicia Caunter) talking about how much these had helped her and how much she had enjoyed them, that we decided to go along. It was a fantastic experience and we made several new friends; we learned so many new skills and it has really helped us in class. We particularly enjoyed the code-breaking lecture as it showed us different ways of looking at Mathematics. We – especially Georgie!– also loved the Microsoft session as we could relate it to the Internet and so much of the technology surrounding us in our every day life.

We would recommend the masterclasses as we have taken away so many positive things from this course."



## DEVON TEAM MATHEMATICAL CHALLENGE



On March 8, 2010, a team of four brave students (Lizzy Hamilton and Pip Halpin from Lower 5, Melanie Etherton and Elizabeth Chick from Upper 5) took part in the Devon Team Mathematical Challenge for schools and colleges in Devon and Torbay.

This had a 'pub quiz' format, with each team working on a problem, or set of problems simultaneously, in a friendly atmosphere. This is what they told us, "First we got the Maths marathon – which is a series of questions using common knowledge to find out the numbers. During the evening we were going to get 4 papers of increasing difficulty; the first paper was a series of tricky questions. The paper we got next was harder and involved us solving problems with shapes. Next was Paper 3 in which we paired up and tried to

solve the puzzles together. Our final paper was challenging but we were up for the challenge and dealt with it, managing to do better than in Papers 2 and 3! We all had a great night!"

Well done, girls, we are all very proud of your performance: a fantastic display of teamwork, flair and stamina!



## JUNIOR MATHEMATICAL CHALLENGE



In April 2010, all Upper 3 and Lower 4 students took part in the Junior Mathematical Challenge organised by the United Kingdom Mathematics Trust.

The paper consisted of 25 multiple choice questions that required a variety of problem-solving techniques in their solution and were not at all straight-forward. Congratulations to all girls who have been awarded a bronze, silver or gold certificate and a special mention to Kavisha Mandalia who gained the best result in the school.

### **GOLD AWARD**

#### **Lower Fourth**

Kavisha Mandalia (Best in school)

### **SILVER AWARD**

#### **Lower Fourth**

Naomi Martin, Ella Mooney, Grace Natusch, Eleanor Niblett, Amy Parnall, Rosalia Taylor

#### **Upper Third**

Anna Broad

### **BRONZE AWARD**

#### **Lower Fourth**

Aurelia Bishop, Alicia Boam, Anastasia Bruce-Jones, Harriet

Dorrington, Katharine Gilbert, Anna Karakusevic, Natasha Lewis, Cecilia Lock, Rosie Lyon-Smith, Mollie Roddan, Joanna Sanders, Eleanor Thomas, Anna Timperley, Molly Waring, Megan Watkinson

#### **Upper Third**

Tatiana Brent, Rohanna Brown, Holly Buckley, Elvina Crowe, Isabel Halpin, Lucinda Rising, Rebecca Rutter, Sofia Srdanovic, Emma Scott, Phoebe Stevens, Bethany Walker, Effie Waring, Saskia Wood

# TREASURE ISLAND DAY

On June 21, 2010, the English and Mathematics Department joined forces for our first ever Treasure Island Day: a cross-curricular journey designed to encourage students' creative thinking and develop their problem-solving skills whilst helping them gain an appreciation of the links existing within different disciplines. The day was a great learning opportunity but also terrific fun as you can see from some of the photographs and from the amazing display lovingly constructed in Room 23 by Kiri Walker (L6 – Art Scholar).



## INTERMEDIATE MATHEMATICAL CHALLENGE



In February 2010 all the Upper 4, Lower 5 and Upper 5 students took part in the Intermediate Mathematical Challenge. The results were excellent with lots of girls gaining awards. A significant number of the Upper 4 have been successful – well done to them since they are competing against students who are 2 years older. Congratulations to everyone who did so well and particularly to Emily Daugherty who gained a gold award and to Lizzie Chick for her gold award and the best result in the school.

### **GOLD AWARD**

#### **Upper Fifth**

Elizabeth Chick (best in school)

#### **Lower Fifth**

Emily Daugherty

### **SILVER AWARD**

#### **Upper Fifth**

Bryoney Alford, Rosemarie Beattie, Melanie Etherton, Olivia Gray, Katherine Grant, Finola Quigly, Inga Steinberg

#### **Lower Fifth**

Abigail Crackett, Lucy Cross, Philippa Halpin, Elizabeth Hamilton, Alexandra Sage, Sarah Walker

#### **Upper Fourth**

Persia Bowater, Katherine Browne,

Rosie Dawson, Georgina Hearth, Georgina Rutter, Kathryn Sanders

### **BRONZE AWARD**

#### **Upper Fifth**

Philippa Borton, Hannah Cope, Eleanor Guest, Rachel Haigh, Emma Pyle, Philippa Rutter, Chantelle Tang

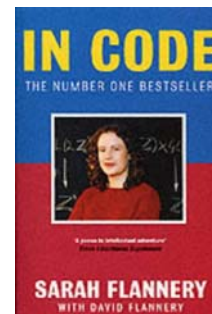
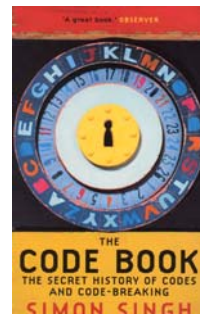
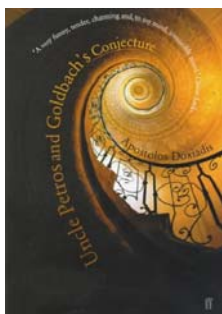
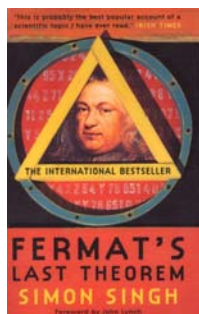
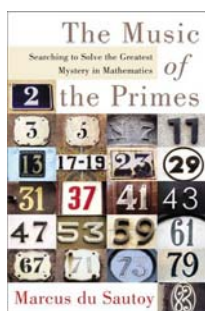
#### **Lower Fifth**

Katherine Chick, Rachel Christie, Anna Ecroyd-Baker, Eden Harris, Phoebe Jephson, Charlotte McIntyre, Isabella McNally, Nia Morrish, Harriet Reynolds

#### **Upper Fourth**

Natasha Brent, Jessie Guscott, Isabel Houston, Laura Powell, Katie Kinver, Olivia Salisbury, Georgina Taylor, Ruth Tresidder, Madeleine Whitehall

The Mathematics Department is constantly adding to and updating its considerable library of books on the history of Mathematics, its development and applications, and our students are encouraged to undertake some reading around the subject. Some of our girls — particularly in the Sixth Form — have found this additional reading invaluable when going for their university interviews; to encourage more of them to read, book reviews written by the students are regularly published in the *Maynard News*.



## Uncle Petros and Goldbach's Conjecture

by Apostolos Doxiadis

Reviewed by Sammi Rosser, Upper VI

Certain periods in your life suddenly make the library a lot more appealing: GCSE revision, for example. Time that should have been spent learning the difference between mitosis and meiosis instead gave way to a healthy rummage through the shelves, turning up some of the very strangest books, and at first glance, 'Uncle Petros and Goldbach's Conjecture' would indeed seem to be one of these odd books but, on closer inspection (and some urging from the Maths department, who seem to have an extrasensory perception for when anyone shows even the slightest interest in a maths book), I was on my way. 'Uncle Petros and Goldbach's Conjecture' isn't exactly how I imagined a mathematical book. There are no long-winded passages about *sin*, *cos*, *tan* or the like; indeed, at times, I found myself wondering whether it shouldn't be re-categorised as a psychology book. There *is* a good story under the mathematical bits, and I could easily describe it as a page turner. You follow the mathematician Petros' journey, from his upbringing in Greece to his professorship, and his ever-deepening obsession with proving Goldbach's conjecture. I began to understand a little about how a truly mathematical and brilliant mind works, and I found myself genuinely sympathising with Petros (although not quite

empathising). However, the Petros we meet is a broken figure, his mathematical creativity gone, his productive life over, and the cut-throat world of mathematics depicted in Mr Unpronounceable's book is as riveting as a detective novel at times, and it even managed to lure me from much needed Chemistry revision so that I could finish it before term ended.

At its core, though, this is indeed a maths book, but most of the concepts are pureed and fed to you through a straw in the form of a tasty smoothie so that you forget that it's Maths and actually enjoy the process. Usually anything approaching double figures makes my eyes glaze over, and the first mention of a theorem or ratio has me running for the hills, but by the end of the book I was seriously considering taking a look at some of the other mathematical treasures on offer. It is cleverly constructed and written in an assured style; the story stands well by itself.

My one complaint is that the ending leaves something to be desired — granted, it was an inevitable ending, but that doesn't stop you feeling slightly cheated when you reach it. However, the book remains enjoyable as well as being educational and something that makes you feel very, very clever indeed whilst reading it. Would I recommend it? Definitely! It's a great introduction to the Mathematics section of the library. One small problem remains, however. As the books so often says, mathematicians are born, not made. Does that give me an excuse for failing my Maths AS?



## SENIOR MATHEMATICAL CHALLENGE



The Lower Sixth and Upper Sixth mathematicians sat a 90-minute Mathematical Challenge paper in November 2009. Well done to all who gained a certificate (over two thirds of our entrants) which is an excellent achievement, especially at this high level. Particular congratulations to Antonia Mattos who performed at such a high standard that, not only did she gain the best result in the school, but

she also qualified to take part in the British Mathematical Olympiad.

### GOLD AWARD

#### Upper Sixth

Venetia D'Arcy, Antonia Mattos (best in school), Qi Qi

### SILVER AWARD

#### Upper Sixth

Caroline Clements, Rachel Pearce,

Sammi Rosser, Sarah Stegink

### BRONZE AWARD

#### Upper Sixth

Sara Cameron, Sophie Reeve, Charlotte Ryley, Lydia Smith

### Lower Sixth

Alicia Caunter, Chloe Pitts, Sasha Reeve, Henrietta Ridley, Hannah Warren