

MATHEMATICAL ASSOCIATION



supporting mathematics in education

3 DAY EVENT

MA ANNUAL CONFERENCE

Keele University - 8th - 10th April 2015

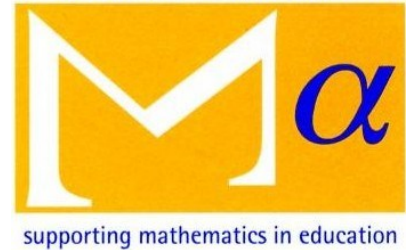
Fluency and
Understanding –
A Mathematically
Balanced World

Keynote speakers

- ✓ Mike Askew
- ✓ Alex Bellos
- ✓ Lynne McClure
- ✓ Ruth Merttens

Image: M. Holland





We look forward very much to welcoming you to The Mathematical Association Annual Conference for 2015.

I'm delighted that we've managed to secure high profile and knowledgeable keynote speakers. The conference will be topped and tailed by Mike Askew and Alex Bellos. Mike gave the thought-provoking after dinner address at BCME last year and I'm sure he'll be just as entertaining. Alex is known as an author and broadcaster on Radio 4 and contributes hugely to raising the profile of maths and maths education. In addition, there will be a Primary Special by Ruth Merttens, whom I know will appeal to more than just primary colleagues, and I shall be doing my best to add to all this with my own Presidential Address. The after-dinner speaker will be our own Andrew Jeffrey; - he will I know work his own brand of mathematical magic.

Peter Ransom has arranged a varied programme of contributed sessions. I am very grateful indeed to all those speakers who will be leading sessions on a range of topics which will appeal to different tastes and interests.

The conference will be packed from start to finish. It's an interesting time for the future of Subject Associations and I do encourage you to come and take an active part in the AGM which will take place on the first day, Wednesday, at 5.50pm. On a lighter note, after dinner that evening David Crawford will host the popular Mathematical Quiz – and points mean prizes... !!

I very much look forward to seeing you at conference.

Lynne McClure

President 2014-15

Programme at a Glance...

Wednesday, 8th April 2015

13.45-15.00	<u>Opening Lecture Mike Askew</u> (Professor in Primary Education)
15.30-16.30	Session 1
16.40-17.40	Session 2
17.50	AGM
19.00-20.30	Dinner
19.00-19.30	Speakers Drinks Reception
20.30	Social event - Quiz with quiz master David Crawford

Thursday, 9th April 2015

09.00-10.15	<u>Plenary Ruth Merttens</u> (Director of Hamilton Maths and Reading Projects)
10.15-10.45	<i>Refreshments and Publishers Exhibition</i>
10.45-11.45	Session 3
11.55-12.55	Session 4
12.55-13.45	<i>Lunch and Publishers Exhibition</i>
13.45-15.00	<u>Presidential Lecture Lynne McClure</u> (Director, Cambridge Maths and MA President)
15.00-15.30	<i>Refreshments and Publishers Exhibition</i>
15.30-16.30	Session 5
16.40-17.40	Session 6
17.40-18.40	Teaching Committee Open Meeting (all welcome)
19.30	President's Reception
20.00	Annual Dinner
	<u>After Dinner Speaker – Andrew Jeffrey (The Mathemagician)</u>

Friday, 10th April 2015

09.00-10.00	Session 7
10.10-11.10	Session 8
11.10-11.30	Refreshments
11.30-12.30	Closing Lecture Alex Bellos (author of <i>Alex through the Looking-Glass</i>)
	END OF CONFERENCE
13.00	Branches Meeting
14.00	Standing Committee Meeting

Wednesday...

11.30

Registration

15.00 - 15.30

Refreshments

Publishers' Exhibition

Session One 15.30– 16.30

Session 1A - Primary

Liz Russell

Who Kidnapped Legohead?

Session 1B - Primary

Stuart Naylor

Maximising engagement in mathematics

Session 1C - Secondary

Douglas Butler

Meaningful Mathematics in HTML

Session 1D - Secondary

Alison Clark-Wilson

Supporting all students to access the challenge of the KS3
Mathematics curriculum through dynamic technology

Session 1E - Post-16

Jonny Griffiths

Madness and Mathematics

Session 1F - Post-16

Tabitha Steel Nathan Barker

Cambridge Mathematics Education Project

Session 1G - All

David Acheson

Keeping it Simple

Session 1H - General

Jim Simons

Footballs are more interesting than football

Session Two 16.40 - 17.40

Session 2A - Primary

Cherri Moseley

What is the bar method?

Session 2B - Primary/Secondary

Geoff Wake

Lessons for Mathematical Solving

Session 2C - Secondary

Chris Pritchard

Ten Ideas for Teaching Area

Session 2D - Secondary

Sarah Giles - Royal Society

Let's talk Vision

Session 2E - Post-16

Terry Dawson

Critical Maths: A Discussion Based
Approach to Learning

Session 2F - Secondary

Peter M. Neumann

Words and their Wonderful Ways

Session 2H - General

Bob Burn

How were logarithms constructed during
the 17th Century

17.50

Annual General Meeting

19.00-20.30

Dinner

19.00-19.30

Speakers Drinks Reception

20.30

Quiz with quiz master David Crawford

Thursday...

9.00-10.15 Plenary Lecture **Ruth Merttens**

10.15-10.45 Refreshments
Publishers' Exhibition

Session Three 10.45-11.45

Session 3B - Primary

Debbie Morgan

Mastering Mathematics - The implications of
a Mastery National Curriculum

Session 3C - Secondary

Michael Fox

Enrichment in GCSE Geometry

Session 3D - Secondary/Post-16

Philipp Legner

The Virtual Classroom

Session 3E - Secondary

Sydney Tyrrell

Statistics - Grasping the Concepts

Session 3F - Post-16

Richard Lissaman

Incorporating coding and computer
algebra systems into maths lessons

Session Four 11.55 - 12.55

Session 4B - Primary

Liz Newbon

Everyone Counts: using real-life data to enhance maths with 8-12 year olds

Session 4C - Secondary

Peter M. Neumann

Words and their Wonderful Ways

Session 4D - Secondary

Fran Watson

NRICH-ing Students' Experience

Session 4E - Secondary/Post-16

Philipp Legner

The Virtual Classroom

Session 4F - Post-16

Rachael Horsman

Ideas you can use tomorrow...

Session 4G - Post-16/All

Adam McBride

The Eternal Triangle

Session 4H - General

Jonny Griffiths

Hikorski Triples (Number Theory)

12.55 - 13.45 Lunch

Publishers' Exhibition

13.45 - 15.00 Presidential Plenary **Lynne McClure**

Thursday...

15.00 - 15.30 Refreshments
Publishers' Exhibition

Session Five 15.30 - 16.30

Session 5A - Primary

Jenni Back

Making Numbers

Session 5B - Primary

Fran Watson

Building with Butterflies

Session 5C - Secondary

Chris Pritchard

Ten Ideas for Teaching Area

Session 5D - Primary/Secondary

Geoff Wake

Lessons for Mathematical Problem
Solving

Session 5E - Post-16

Jennie Golding

What you test is what you get:
An A-level Lens

Session 5F - Post-16

Tabitha Steele Nathan Barker

Cambridge Mathematics
Education Project

Session 5G - All

Samantha Durbin Ben Dornan

Royal Institution Masterclasses

Session 5H - All

David Crawford

Mathematical Magic Tricks

Session Six 16.40 - 17.40

Session 6A - Primary

Stuart Naylor

Maximising engagement in
mathematics

Session 6B - Primary

Andrew Jeffrey

Adventures in Six-Land

Session 6C - Secondary

Robert Barbour

Can we make maths teaching
better?

Session 6D - Secondary

Stephen Lyon

Using Resources to Develop
Fluency and Understanding

Session 6E - Post-16

Stella Dudzic

Core Maths

Session 6H - General

James Grime

Enigma and the Secret World of
Codes and Code Breaking

17.40 - 18.40 Teaching Committee Open Meeting

19.30 Presidential Reception

20.00 Annual Dinner

After Dinner Speaker Andrew Jeffrey

Friday...

Session Seven 09.00 - 10.00

Session 7A - Primary

Ray Huntley

A fresh slice of Pie?

Session 7C - Secondary

Sidney Tyrrell

Statistics - Grasping the Concepts

Session 7E - Secondary/Post-16

Philipp Legner

The Virtual Classroom

Session 7F - Post-16

Peter McOwan

Teaching maths using magic

Session 7G - All

Jane Jones

The new National Curriculum: Challenges
and opportunities - a view from Ofsted

Session 7H - General

Paul Harris

An application of Mathematics
to image analysis

Session Eight 10.10 - 11.10

Session 8C - Secondary

Rachel Horsman

Ideas you can use tomorrow...

Session 8D - Secondary

Darren Macey

The Changing face of Maths
Assessment

Session 8E - Secondary

Douglas Butler

Meaningful Mathematics in
HTML

Session 8F - Post-16/All

Adam McBride

The Eternal Triangle

Session 8H - General

Peter Ransom

Isaac Newton : contains awe

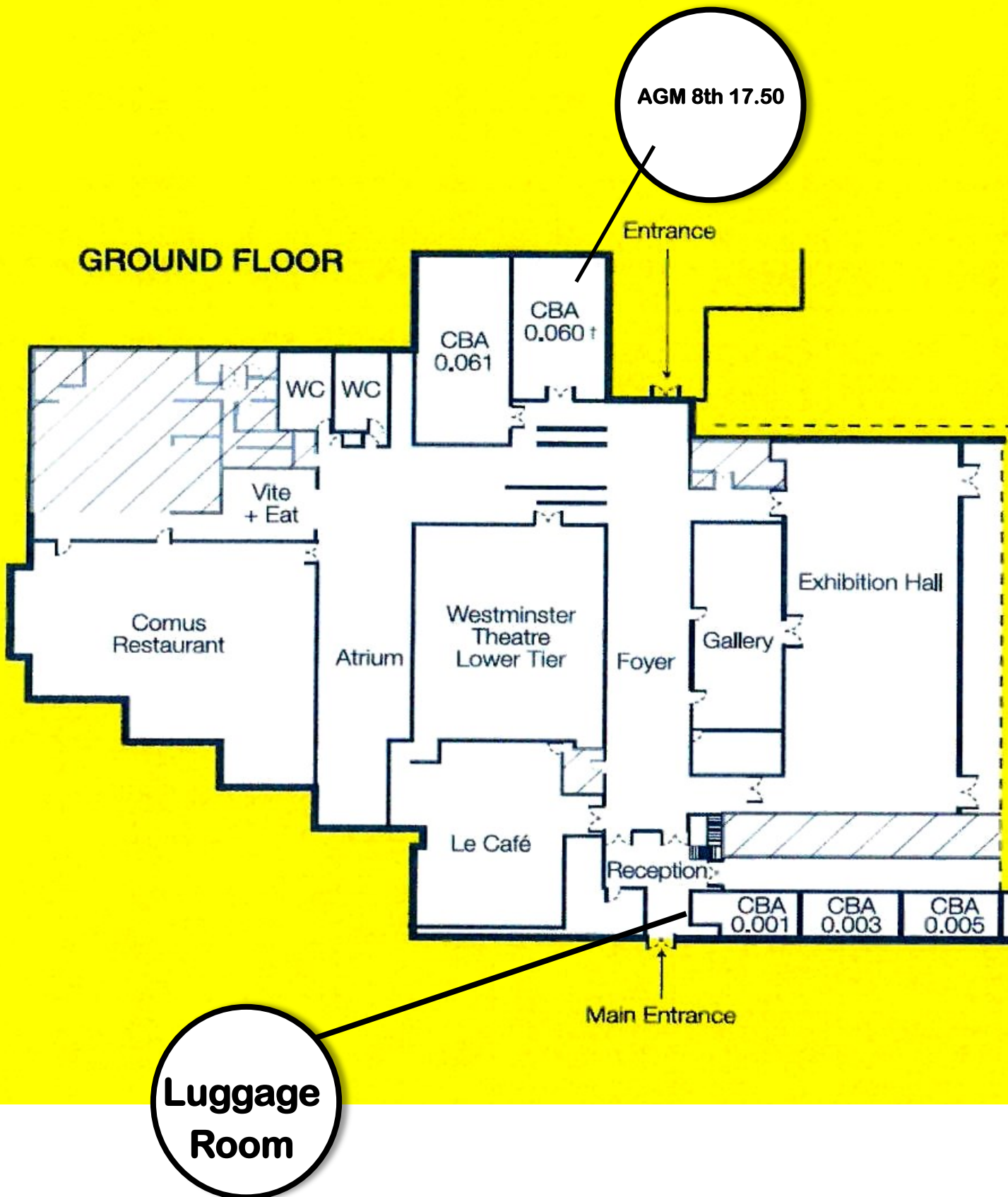
11.10 - 11.30 Refreshments

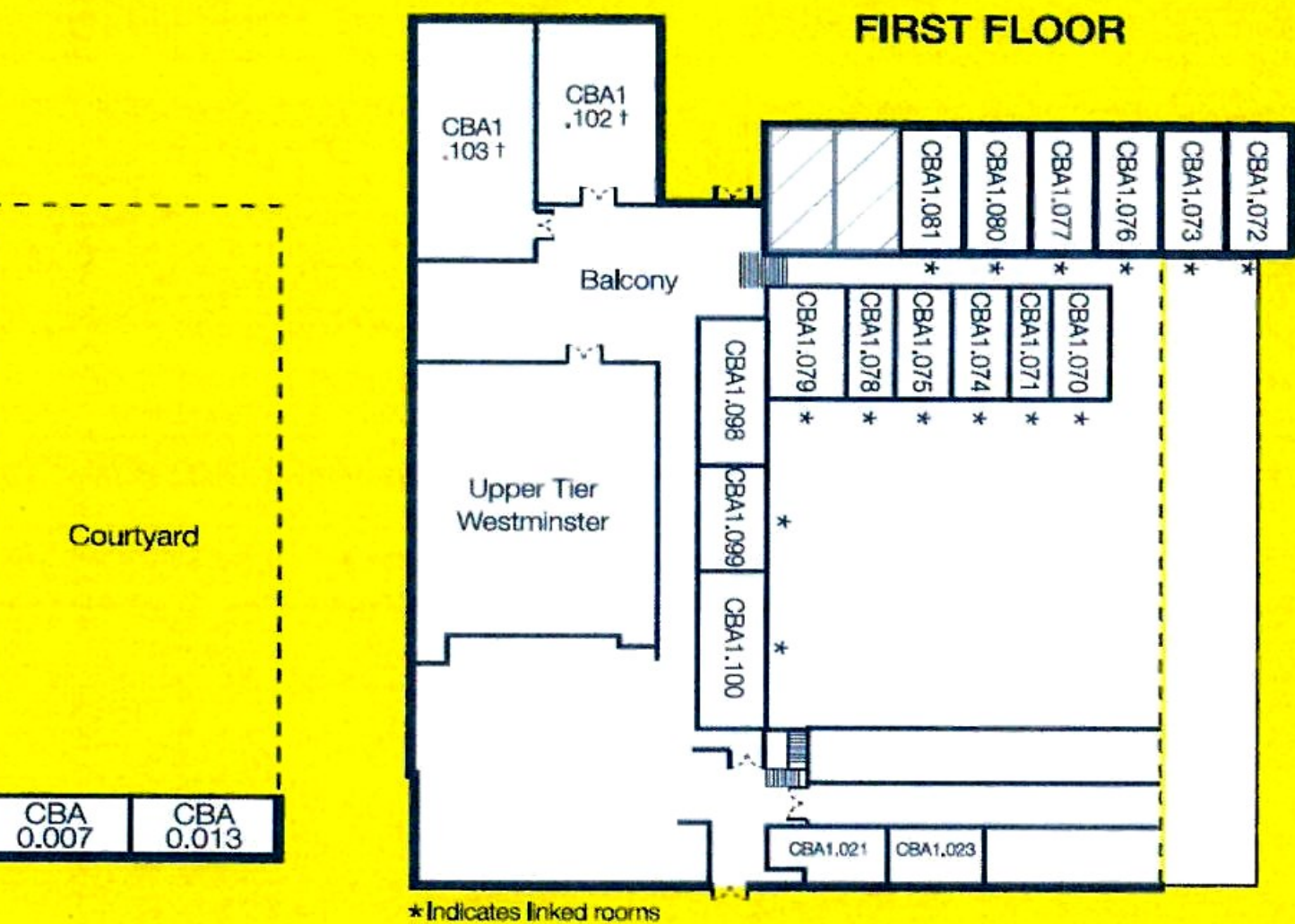
11.30 - 12.30 Closing Plenary Alex Bellos

13.00 Branches Meeting

14.00 Standing Committee

Chancellors





About the Speakers and Sessions...

David Acheson

Title of Session: ***Keeping it Simple***

Abstract – Sometimes in mathematics, it is possible to go a very long way with remarkably simple ideas. I will look at a number of examples ranging from elementary geometry to fluid mechanics and superstrings.

About the speaker – David is author of the bestseller '*1089 and All That*', and was President of the MA for 2010-2011.

Jenni Back

Title of Session: ***Making Numbers***

Abstract - This practical workshop will be based on work we have been doing with teachers and children in connection with our Nuffield funded project. We are exploring how to use manipulatives effectively in teaching early arithmetic concepts and skills. Come and find out what we have discovered and try out some rich activities for yourselves.

About the Speaker - TBC

Robert Barbour

Title of Session: ***Can we make maths teaching better?***

Abstract - I shall describe ways I have worked with a group of schools to develop mathematics teaching...despite accountability pressures, national curriculum, recruitment issues etc. I shall also look to the future and describe how ACME, of which I am a member, is working to try to bring about a better future.

About the speaker - Robert taught mathematics for 21 years in 4 schools and then worked in 3 local authorities in England and Wales. Between 2010 and 2013 he was an HMI and a member of the HMI maths team. Since then he has worked as an independent consultant and member of ACME. He is a former president of the MA.

Bob Burn

Title of Session: ***How were logarithms constructed during the 17th century***

Abstract -- Kepler (1624) with geometric means, after Napier (1614); Briggs (1617 and 1624) with large indices; also with repeated square roots; Brouncker (1668) with a hyperbola and an infinite series of rational numbers; Mercator (1668) with a hyperbola and an infinite algebraic series. Please bring a calculator.

About the speaker - For the last 25 years I have been exploring how new concepts in mathematics have emerged historically, in order to understand the process of learning and discovery. Logarithms are a particular case in point, provoking negative numbers, the use of decimal place value, indices and pushing forward trigonometric notions.

Douglas Butler

Title of Session: ***Meaningful Mathematics in HTML***

Abstract - More and more standard mathematics software is reappearing to run in HTML, and hence 'on any device'.

This session will look at Geogebra, Autograph and other titles that have made the jump, so you can judge how successful they are in their new surroundings. Bring your own device, but not too small a screen!

About the speaker - Mathematics teacher for 30 years, now concentrating on TSM workshops and Autograph development.

Alison Clark-Wilson

Title of Session: ***Supporting all students to access the challenge of the key stage 3 mathematics curriculum through dynamic technology – the Cornerstone Maths approach.***

Abstract - In this workshop, you will find about and use some of the Cornerstone Maths curriculum resources, which aim to resolve some of the issues around widespread uses of technology and provide teachers and pupils with research-informed approaches to access challenging topics in the new key stage 3 programme of study.

About the speaker - Alison Clark-Wilson, a former secondary mathematics teacher, works as a Research Fellow at the London Knowledge Lab, Institute of Education, London, on the ambitious Cornerstone Maths project, which has developed curriculum units and professional development for key stage 3 mathematics (www.cornerstonemaths.co.uk)

David Crawford

Title of Session: ***Mathematical Magic Tricks***

Abstract - In this session I will demonstrate some mathematical magic tricks using numbers and cards that could be used to add a bit of a "wow" factor in the classroom. Please bring paper, a calculator if you want and plenty of willingness to participate.

Intended Audience: Teachers of KS2, KS3 and KS4 plus anyone who enjoys tricks.

About the speaker - David has been Head of Maths at Leicester Grammar School for 17 years. He is a regular speaker on Mathematical Magic at conferences for both adults and pupils and has written a book on the subject. He is also involved with editing

Terry Dawson

Title of Session: ***Critical Maths : A discussion based approach to learning***

Abstract - It is well documented that many students fail to see how mathematics is relevant to their everyday life and future career. Critical Maths is a DfE funded project which attempts to address these issues by offering a curriculum which demonstrates how mathematics is crucial when making important decisions and interpreting/understanding everyday information. This session will examine some of the free resources available, and demonstrate the discussion based teaching approach, which starts with a simple question and ends with a mathematical structure.

About the speaker Terry is a curriculum developer working for MEI on the new core maths qualifications. Prior to joining MEI, Terry taught mathematics for over 20 years including 13 years as a Head of Mathematics, 2 years as an Assistant Head, and a

Stella Dudzic

Title of Session: ***Core Maths***

Abstract - The introduction of Core Maths qualifications has highlighted the question of what mathematics everyone needs to be able to do post-16. This session will look at some situations that can be sources of mathematics for students undertaking such qualifications. It may also be of interest to teachers who are interested in exploring examples of mathematics in life.

About the speaker - Stella is an experienced teacher, author and curriculum developer. She is Programme Leader (Curriculum) for Mathematics in Education and Industry, which is an independent curriculum development body. She has taught mathematics in secondary schools for 22 years and was a head of faculty before taking up her current post in 2006.

Samantha Durbin & Ben Dornan

Title of Session: ***Royal Institution Masterclasses***

Abstract - Royal Institution Masterclasses aim to encourage, inspire and engage young people in the art, practice and value of mathematics and help develop mathematical understanding. Come along to meet us, try out some Mathematics, Engineering and Computer Science Masterclass activities and find out how you and your students can get involved.

About the speaker - Samantha Durbin is Clothworkers' Associate in Mathematics at the Royal Institution, responsible for coordinating our national networks of Secondary Mathematics Masterclasses and Primary Mathematics Masterclasses. Dr Ben Dornan is Causeway Associate in Computer Science, coordinating our brand new Computer Science Masterclass Network. Our Master-

Michael Fox

Title of Session: ***Enrichment in GCSE Geometry***

Abstract - Investigations are a useful form of enrichment: they can be directed or open-ended; as easy as using software to discover the properties of a given diagram, or as hard as proving or disproving the discoveries. We shall investigate a particularly "rich" diagram, and there will be some tantalising challenges. Please bring a laptop with Geogebra or similar software. Suitable for teachers of KS4 and anyone with an interest in elementary pure geometry.

About the speaker - Michael Fox is a former maths teacher, head of department, and school head, working in selective and comprehensive schools. He has contributed articles to MiS and the Gazette, and is a regular speaker at MA conferences.

Sarah Giles – Royal Society

Title of Session: ***Let's talk Vision***

Abstract - The Royal Society Vision for science and mathematics education report sets out a route map for transformation of the quality of science and mathematics education over the next 20 years. This event will comprise of a panel debate that opens up to the audience, debating the recommendations of the report.

Jennie Golding

Title of Session: *What you test is what you get: An A-level lens*

Abstract - What does the future hold for A-Level assessments? Many teachers recognise the fairly limited process demands made by current papers, and in principle would welcome assessments which support a focus on problem solving and communication of mathematical reasoning, even if teaching for that seems daunting. Awarding Bodies are now developing questions to assess the new A-Level (for first teaching 2017): this is your chance to have a go at some of those (chosen to draw on material from the current AS Core). There are some lovely questions emerging, but how can we teach for them, and what are the assessment issues? Enjoy the questions, and feed into further question development and understanding of the teacher support needed

About the speaker - Jennie was based in a classroom until two years ago, having taught 3-93 year-olds over 35+ years. She was vice-chair of ACME, so heavily involved in policy as well as teaching, and now works fulltime in research/teacher development. She is passionate about developing opportunities for all young people to be challenged by, and enjoy, mathematics.

Jonny Griffiths

Title of Session 1: *Madness and Mathematics*

Abstract - Cantor spent part of his life in a lunatic asylum; could this have been the result of his ground-breaking reflections on the concept of infinity? Ramanujan said some of his theorems were granted to him by a higher power when in a trance-like state. John Nash's battle with psychiatric illness has been well-documented in the book and film, 'A Beautiful Mind' - how did his mathematics relate to his illness? The session presenter also encountered psychiatric illness in his youth, and he would argue maths played a large part in his recovery. The interplay between mathematics and madness is a perennial theme for us to explore.

Title of Session 2: *Hikorski Triples. (Number Theory)*

Abstract - We have all encountered the Pythagorean Triples $(a, b, (a^2+b^2)^{0.5})$. There are infinitely many of the primitive variety, and they can be parameterised simply. This session introduces a new collection of natural number triples $(a, b, (ab+1)/(a+b))$, that arise from a simple yet evocative mathematical situation. What resonances does the expression $(ab+1)/(a+b)$ have for you? We shall explore the parameterisation of these triples.

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About the speaker - Jonny Griffiths teaches at Paston Sixth Form College, where he has been for over 20 years. He's studied mathematics and education at Cambridge University, the Open University, and the University of East Anglia. He was a Gatsby Teacher Fellow in the year 2004-5.

James Grime

Title of Session: *Enigma and the Secret World of Codes and Code breaking*

Abstract - Secret messages and code breaking are a wonderful way to engage students of all ages with mathematics. We will see a lot of different mathematics arise naturally, as well as practising our problem solving skills. Participants will get to test their own code breaking skills - and a chance to see an original WWII Enigma Machine! Suitable for KS2, 3, 4, 5, college, university.

About the speaker - James Grime has been running The Enigma Project for KS2-5 in schools for seven years. Feel free to quiz him with any questions you may have about codes, Enigma and beyond!

Paul Harris

Title of Session: *An application of Mathematics to image analysis.*

Abstract - Digital images are an important feature of modern life, with uses ranging from photographs of family holidays to images of the inside of the human body obtained using MRI. However, these images can be contaminated with noise or may be blurred. Mathematical methods for removing these unwanted artefacts from the image lead to non-linear partial differential equations which need to be solved to obtain the original uncontaminated image. This talk will look at how these differential equations are obtained, and then consider a numerical method for obtaining the required solution. The numerical solution process leads to a large system of non-linear algebraic equations which has to be solved (with typically tens or hundreds of thousands of equations and unknowns) and the talk will discuss the special techniques which have to be used to implement the methods on a PC. The talk will be illustrated with a number of typical examples.

About the speaker - Paul is a Reader in Mathematics at the University of Brighton where he has worked for over 20 years. His research interests are in the use of numerical methods to solve problem applied mathematics, some of which he will talk about in this session.

Rachael Horsman

Title of Session: ***Ideas you can use tomorrow...***

Abstract - During this session we will trial a variety of ideas and resources developed to engage pupils with their learning. Be prepared to move, laugh and enjoy some activities, but also consider why they are beneficial to our Post 16 pupils.

About the speaker: Rachael an experienced classroom teacher and head of department. I have worked in grammar schools, those requiring improvement and those with 50% EAL pupils. I have delivered training all around the world. My aim is to make pupils enjoy and understand their maths.

Ray Huntley

Title of Session: ***A fresh slice of Pie?***

Abstract - In this session, Ray looks back into MA archives and explores some problems from early issues of Mathematical Pie. He will offer updated versions of old problems and consider how this great resource might be employed today, linking to the National Curriculum fluency, reasoning and problem solving.

About the speaker - Ray spent 18 years teaching and leading in several primary schools in Essex and Melbourne. He now lectures on ITE programmes for primary teachers. Ray has been a member of the MA for many years and enjoys sharing maths problems old and new.

Andrew Jeffrey

Title of Session: ***Adventures in Six-Land***

Abstract - The 2014 Curriculum requires children to have mastered place-value by the end of Y2. Yet surprisingly few teachers have ever studied bases other than base 10. This fun hands-on workshop will help teachers to both understand the benefits and teach all number bases to children from Reception age upwards, so that they will have a deep understanding of their own number system.

Jane Jones

Title of Session: ***The new National Curriculum: challenges and opportunities – a view from Ofsted.***

Abstract - Jane will explore some of the challenges and opportunities presented by the new National Curriculum, including Mastery, and the new GCSE, drawing on evidence and some illustrative examples from recent inspections.

About the speaker - As Ofsted's National Lead for Mathematics across the 3-19 age range, Jane manages the annual programme of mathematics inspections, disseminates the findings through survey reports and talks at conferences, and provides advice to HMCI and others. A growing dimension of Jane's role is improvement work in mathematics, principally the *Better mathematics* conferences, which draw on *Mathematics: made to measure*.

Philipp Legner

Title of Session: ***The Virtual Classroom***

Abstract - Journey into the future of education technology, where students follow a personalised curriculum and textbooks adapt seamlessly. We will investigate how digital platforms and artificial intelligence can be used to create content that is motivating as well as reactive and "*explorable*" – allowing students to make discoveries, rather than just be told the answer.

About the speaker - Philipp has studied Mathematics at Cambridge University and Mathematics Education at the Institute of Education in London. He has worked at Wolfram Research, Touch Press and the BBC, and is currently a software developer at Bloomberg. Philipp is also the creator of the award winning mathematics outreach website *Mathigon*.

Richard Lissaman

Title of Session: ***Incorporating coding and computer algebra systems into maths lessons***

Abstract - This session is particularly relevant to those interested in MEI's new Further Pure with Technology unit which allows the use of Computer Algebra Systems and a programming language in its assessment. It will also be of interest to teachers who wish to incorporate CAS and coding into general maths lessons.

About the speaker - Richard Lissaman is the Online Resources Coordinator for MEI. He has extensive experience of supporting students and teachers with A level Further Mathematics. His current role involves supporting students and teachers with MEI's Further Pure with Technology unit and promoting the use of CAS and programming in the maths classroom.

Stephen Lyon

Title of Session: ***Using Resources to Develop Fluency and Understanding***

Abstract - Join me on a journey through the National STEM centre's eLibrary to discover mathematics resources freely available that can be used in the classroom to develop fluency and understanding. Meet some old favourites as well as a wealth of new mathematics resources; stopping off to try some resources yourself.

About the speaker - Stephen Lyon taught mathematics for over 20 years in a variety of secondary schools, to all abilities and age ranges up to further mathematics. After being head of mathematics at a school in the first cohort of mathematics and computing schools he became an advanced skills teacher working in primary and secondary schools in York. For the last three years he has been mathematics specialist at the National STEM centre.

Adam McBride

Title of Session: ***The Eternal Triangle***

Abstract- The geometry of the humble triangle contains an almost endless supply of beautiful results. We shall look at a few such results, some familiar and others perhaps less so.

About the speaker - Past President of the MA and of the Edinburgh Mathematical Society. Past Chairman of the Scottish Mathematical Council and the British Mathematical Olympiad Committee. Currently Chair of MA Council and Treasurer (formerly Vice-Chairman) of the United Kingdom Mathematics Trust. From 01/10/11 Adam became Emeritus Professor.

Peter McOwan

Title of Session: ***Teaching maths using magic***

Abstract - This workshop will demonstrate how simple, self-working magic tricks can be used to teach basic mathematical and computer science principles.

About the speaker - Peter is a professor of computer science at QMUL researching robotics and artificial intelligence. He is also actively involved in outreach around maths and its applications and was awarded a National Teaching Fellowship in 2008.

Darren Macey

Title of Session: ***The Changing Face of Maths Assessment***

Abstract – A look through the Cambridge Assessment archives at how maths assessment has developed since the 1850s. Is it genuinely easier today? And do we always compare like with like?

About the speaker – Darren Macey is a former maths teacher who now works in OCR's subject specialist team delivering CPD, designing exam specifications and supporting the teaching community.

Debbie Morgan

Title of Session: ***Mastering Mathematics – The Implications of a Mastery National Curriculum***

Abstract - The National Curriculum states that “*the expectation is that the majority of pupils will move through the programmes of study at broadly the same pace*” This has implications for planning, teaching and assessment. This session will explore the implications, offering practical strategies to develop mastery and meet the higher expectations set within the curriculum.

About the speaker - Debbie holds a national role as Director of Primary Mathematics at the National Centre for Excellence in teaching mathematics. She has previous experience as a Primary teacher, Headteacher, Mathematics Advisor, Senior Lecturer in Mathematics Education and Director of a Mathematics Specialist Teacher Programme. Her current responsibilities include providing advice and expertise to the Department for Education to support the Implementation of the New Primary National Curriculum for Mathematics and she is a regular keynote speaker at conferences across the country.

Cherri Moseley

Title of Session: ***What is the Bar Method?***

Abstract - What is the Bar Method? Come along and find out just how simple and straightforward this method is. It does not solve the problem for you but clearly shows what you know and what you don't know, so you can go ahead and turn unknowns into knowns!

About the speaker - Cherri Moseley is an Independent Primary Mathematics Consultant and author. She is an Accredited Numicon Consultant, Big Maths and Little Big Maths consultant, online trainer for Pearsons and author (or one of the authors) of several well-known mathematics systems, schemes and books.

Stuart Naylor

Title of Session: ***Maximising engagement in mathematics***

Abstract - Does engagement in mathematics matter, or is mathematics supposed to be tedious for learners? Is dull and boring teaching the best way to prepare for dull and boring tests? This workshop presents a range of quick, simple and effective strategies that can make learning more engaging, lessons more enjoyable and teaching more inspiring.

About the speaker - Stuart Naylor has extensive experience as a classroom teacher, teacher educator, researcher, writer, publisher, consultant and CPD provider. He is well known, with Brenda Keogh, as the creator of Concept Cartoons and Active Assessment publications. He has a reputation for innovative publications, thought-provoking professional development and creative ways of enhancing teaching, learning and assessment in classrooms.

Peter M. Neumann

Title of Session: ***Words and their Wonderful Ways***

Abstract 'Words and their Wonderful Ways' is the title of a masterclass designed for UKMT Mathematical Circles (Y10 students). It is intended to bridge the gap between Y10 knowledge and an area of current research in pure mathematics. My ambition here is to adapt it as an interactive session for schoolteachers.

About the speaker - Peter taught for 45 years in The Queen's College, Oxford and in the University of Oxford Department of Mathematics. Since retiring in 2008 he has continued teaching, and he has been heavily involved in various UKMT activities. His research areas are algebra (group theory in particular) and history of algebra (particularly 19th Century history). He is currently the MA's President Designate.

Liz Newbon

Title of Session: ***Everyone Counts: using real-life data to enhance maths with 8-12 year olds***

Abstract - Explore opportunities for using global citizenship to promote real-life learning in maths. Oxfam's new classroom resource, *Everyone Counts*, brings the maths curriculum to life by comparing children's experiences around the world. Pupils will develop skills and understanding of topics such as time and data handling.

About the speaker - Oxfam works to empower young people to be active global citizens. We promote education that helps young people understand the global issues that affect their lives and take action towards a more just and sustainable world. We support teachers through resources, teacher training and partnership work.

Chris Pritchard

Title of Session: ***Ten Ideas for Teaching Area***

Abstract - Both primary and secondary teachers help youngsters to understand area, the concept and the methods. In this session I will endeavour to provide some new insights, approaches and materials, some of which will be taken from a book to be published in 2015. I aim to have something different from what appears in the textbooks for teaching area from Y6 upwards, and with plenty of problem solving incorporated.

About the speaker - Chris Pritchard is the Secretary of the MA and Chair of the Scottish Mathematical Council. He is currently working on the first of two books on area arising from his series 'A square peg in a round hole' in *Mathematics in School*, a journal he also co-edits.

Peter Ransom

Title of Session: ***Isaac Newton: contains awe***

Abstract - Sir Isaac will deliver an interactive session touching on some of his more obscure experiments. He will tolerate anyone who is willing to try some mathematics. He will attempt to show how STEM work can enrich mathematics, linking this in with the latest Royal Society's Vision report.

About the speaker - Peter is the MA's Immediate Past President. He spent nearly 40 years teaching in state secondary schools and now does as he pleases (when his wife allows him). He is involved with the Princes Teaching Institute and many professional associations. Peter probably has more period costumes than normal clothes.

Liz Russell

Title of Session: ***Who kidnapped Legohead?***

Abstract - Come and solve the Mystery of who kidnapped Legohead. I believe that we have to help our students to build resilience to solve mathematical problems and having a story can help. Take away ideas to make your own mystery. This has been tested with students from Y7 to Y10 and all enjoyed it.

About the Speaker - TBC

Jim Simons

Title of Session: ***Footballs are More Interesting than Football***

Abstract - I tried to watch the Football World Cup, but was more interested in the pattern on the balls... Meet the 17 spherical symmetry patterns, and the 17 “wallpaper patterns” in the plane. See the Magic Theorem, which enumerates these patterns, and learn about orbifolds, which explain the Magic Theorem.

About the speaker After 35 years working as a professional mathematician at GCHQ, in his retirement, Jim is a private tutor for maths and physics A level, and a member of the MA's Teaching and Membership committees.

Tabitha Steel and Nathan Barker

Title of Session: ***Cambridge Mathematics Education Project***

Abstract - Currently in the development phase, the project will provide innovative online resources to help support and inspire teachers and students of A-level mathematics. The aim is to help to make sixth-form mathematics a rich, coherent and stimulating experience for students and teachers. Join us to get a preview of our website, and to work together on some of our new A-level resources

About the speakers – Tabitha and Nathan both joined CMEP in 2014 and work with a small team to develop resources as part of this project. Prior to joining the CMEP team Tabitha and Nathan both taught mathematics in Cambridgeshire schools and were actively involved with NRICH, a sister project to CMEP.

Sidney Tyrrell

Title of Session: ***Statistics – Grasping the concepts***

Abstract - This is about grasping the concepts and thinking statistically. Simple bite sized practical ideas which I have found helpful for teaching statistical concepts to students who find statistics boring, hard or both. Ideas and a CD of resources, links to web based resources, useful real data sets, and Excel spreadsheets.

About the speaker - A National Teaching Fellow experienced in teaching statistics to non-mathematicians.

Fran Watson

Title of Session: ***Building with butterflies***

Abstract - Mathematical origami is aesthetically beautiful, thought provokingly engaging and can provide a kinaesthetic challenge to both novices and experts alike. Come along to explore, and create models of your own – refreshes the parts that other ‘souvenirs’ cannot reach!

About the speaker - Fran is part of the NRICH team, as the Roadshow co-ordinator and, due to her passion for mathematical paper folding, has now begun to offer workshops to students and teachers about this version of “hands-on maths” too.

Fran Watson (NRICH)

Title of Session: ***NRICH-ing students’ experience***

Abstract - We know that mathematics lessons need to challenge and engage students. How do we encourage our students to work and think like mathematicians? This session will offer delegates an opportunity to explore some new activities from the NRICH collection, to consider the opportunities they offer for deepening mathematical understanding, and to consider how they can be integrated into the school curriculum.

Geoff Wake

Title of Session: ***Lessons for Mathematical Problem Solving***

Abstract - This session will present video from a Nuffield-funded project in which clusters of schools have used lesson study for mathematical problem solving. Participants will have an opportunity to try some of the tasks that have been used and comment on a developing toolkit that supports problem-solving in the classroom.

About the speaker - Geoff Wake works in Mathematics Education at the University of Nottingham. His recent work is focused on supporting and researching teacher professional development in teaching inquiry skills, problem solving and connecting maths to the world of work.

Presidential Address...



Lynne McClure

Director Cambridge Maths and MA President

Mike Askew

Adjunct Professor of Primary Education at Monash University, Melbourne

Opening Speaker

What counts in a balanced mathematics education?



Ruth Merttens

Director of Hamilton Maths and Reading Projects

Primary Speaker

On prescription only: The new National Curriculum



Alex Bellos

Author of *Alex through the Looking-Glass*

Closing Speaker

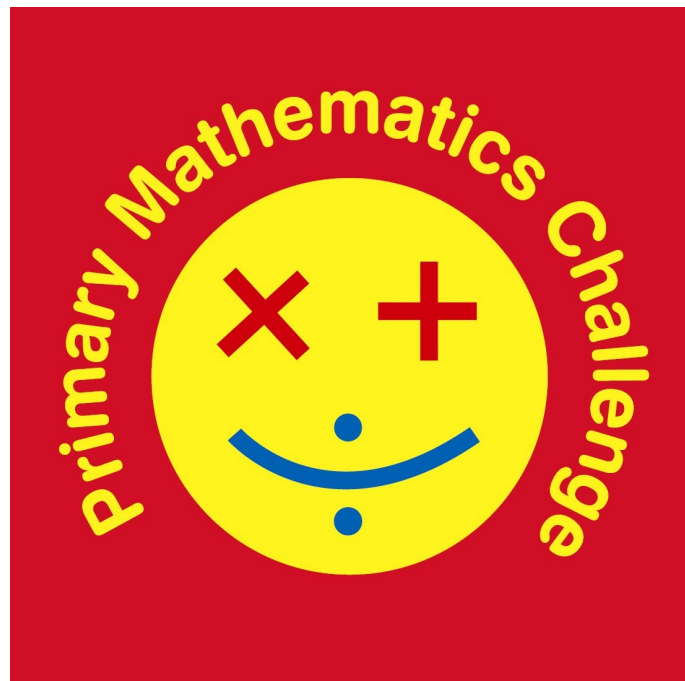


Andrew Jeffrey

The Mathemagician

After Dinner Speaker





Bring the Primary Maths Challenge into your school!

PMC is aimed at children in years 5/6 throughout England, P6/P7 in Scotland and years 6/7 in Northern Ireland

PMC comes in packs of ten question papers; enter as many children as you like! Children will compete within their schools for the first round in November, the high scorers are then invited to compete in a bonus round in February

Phil McCann has a bucket under two leaks in his classroom roof. One leak drips at 4 ml per second and the other at 6 ml per second. His bucket leaks at 2 ml per second. How many seconds will it take to fill his 6000 ml bucket?



A 500 B 750 C 1000 D 1500 E 3000

Over 79 000 pupils took part in 2014/2015

The paper is set out in multiple choice style questions. The first ten questions are easy and are accessible to all, the next ten are a little harder. The final five questions are the most tricky



"...I liked the fact I had to use my general knowledge as well as my mathematics to answer the questions..."

"...Loved it! Some great questions to promote discussion and reasoning..."

"...An excellent variety of questions and a good level of challenge ..."

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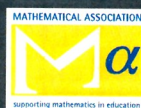
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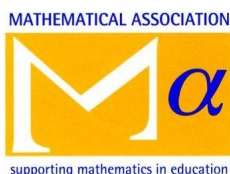
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2016 Annual Conference

Hold these dates

5th – 7th or 4th – 6th April 2016

Venue to be confirmed

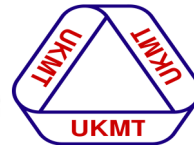
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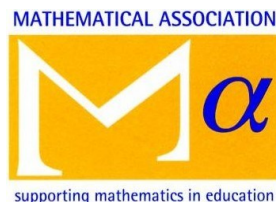
The Mathematical Association 259 London Road Leicester LE2 3BE

Exhibitors...



The MA would like to thank all our exhibitors. We would like to offer special acknowledgment for **Texas Instruments** who have kindly sponsored the Publishers Drinks Reception; to **OCR** who have sponsored the delegate folders and to **La Salle** for the sponsorship of the badges.

The MA would also like to thank the Keynote Speakers and Session Leaders, the most important element of a successful conference. Thanks to the Keele Conferences and Events Staff. Thanks to David Hodgson for writing this year's quiz and to David Crawford for delivering it. Lastly thanks to Peter Ransom, Chair of Conferences and the MAHQ team.



Mathematical_A



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