

MA - NANAMIC 2020 CONFERENCE
Exploration and Insights
Session Details

TUESDAY 14th April

Date: 14/04/2019 Time: 13.00-14.00

Session Code: **PLENARY** Audience **All**

Ems Lord, NRICH Director, President of the Mathematical Association, a member of the Joint Mathematical Council and a Founding Fellow of the Chartered College of Teachers.

Title: **Nurturing the next generation of mathematicians: The case for mathematical fluency**

In our increasingly automated world, we need to ensure that our mathematics students have the best possible preparation to thrive in their rapidly changing world, but which skills should we prioritise? In this opening talk, Ems will explore with members some of the latest research surrounding mathematical fluency and ask whether we're really focusing on the most crucial aspects for our changing world.

Date: 14/04/2020 Time: 14.15-15.30

NRICH Workshop Audience **ALL**

Title: **Nurturing Flexibility and reflective thinking**

Summary: Following on from our opening talk, the NRICH team will be on hand to guide delegates through this highly practical workshop. Be prepared to exercise your mathematical muscles by working flexibly, thinking mathematically and being reflective as we explore a range of mathematical activities for a wide range of ages and attainment levels.

Date: 14/04/2020 Time: 14.15-15.30

NANAMIC Research Session - a split session with Jenny Stacey and Dr Diane Dalby

Jenny Stacey

Title: ***Does low confidence reduce success rates of adult learners studying GCSE Mathematics in Further Education (FE) colleges? Outcomes of the pilot study.***

Summary: The main research project is designed to collect information on the changing perceptions of adult learners studying GCSE mathematics in FE colleges. These learners are re-entering education, often after a break of some years, and usually with an extrinsic motivation, such as an Access to Higher Education or degree course, entry to which requires a grade 4 or better in GCSE Mathematics.

The study also aims to compare learners' responses to their marks in the final exams to see if there is a correlation between the confidence learners perceive, and their success rates.

The research design is a mix of quantitative and qualitative methods, in order to gain a broad understanding of the experiences of adult learners.

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The pilot study involved trialling an information letter, consent form and questionnaire with a small group of approximately 20 students, and I will present and discuss the findings. It was highly informative for the main research phase.

Dr Diane Dalby

Title: ***What is needed to improve the teaching of Mathematics in Further Education (FE) colleges? Interim report on The Mathematics in Further Education Colleges Project (MiFEC), led by academics from the University of Nottingham's School of Education***

Many students enter college without GCSE Mathematics at grade 4 or above so need to study mathematics until they achieve this (or leave college).

A new Nuffield-funded report into the state of mathematics education across England's further education sector has found that major investment in leadership training and teacher professional development is required to make more significant and sustained improvements.

Date: 14/04/2020 Time: 17.00-18.00

Session Code: NRICH Audience ALL

Title: **Escape Room Special Event**

Following on from last year's highly successful Marble Run challenge, the NRICH team invite you to explore our Escape Room challenge which we've devised especially for today's event. Test your skills, solve the puzzles and enjoy working mathematically with colleagues old and new.

There will even be a (small) prize for the winning team, but we all know that it's the taking part that really counts, so do come along and join in the fun. Everyone welcome.

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WEDNESDAY 15th April

Date: 15/04/2019 Time: 9.15-10.00

Session Code: **PLENARY** Audience **ALL**

Chris Smith, Scottish Teacher of the Year 2018, winner of BBC Quiz, *Britain's brainiest family*.

Title: *Twenty Twenty Vision...From a geek with specs!*

Summary: Exploration: let's chat about some of my Maths adventures up until 2020. Insights: what have these taught me heading into the rest of 2020 and beyond? We'll definitely have the odd geeky puzzle, overdose on Mathematical puns, reminisce about Pi Day antics, share some unseen stories from Family Brain Games, focus on the world's finest free weekly Maths newsletter and, if everyone behaves, we'll have a sing-along musical finale!

Date: 15/04/2020 Time: 10.15-11.15

Session Code: **1A** Audience **General**

David Acheson

Title: *Great Mistakes*

Summary: We all learn by mistakes, and drawing attention to some of the more subtle or amusing ones can sometimes enliven mathematics teaching, at any level. I will dip into history in search of some of the greatest mistakes, and possibly admit to a few of my own.

Date: 15/04/2020 Time: 10.15-11.15

Session Code: **1B** Audience **General**

Colin Foster, Geoff Wake, Fay Baldry and Jacqueline Mann

Title: *What might a coherent mathematics curriculum look like?*

Summary: In this session, we will draw on our recent ESRC-funded project Exploring socially distributed professional knowledge for coherent curriculum design, in which we are collaborating with colleagues at Tokyo Gakugei University in Japan, where they are currently revising their mathematics curriculum. We will explore what we can learn about how to build coherence into a mathematics curriculum, across topics and ages. We will share some examples of the detailed, thoughtful task design that informs the creation of mathematics lesson resources in Japan and examine how the careful use of 'didactical devices' can support students in making important connections.

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Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1C **Audience Primary**

Caroline Clissold

Title: *What is a fraction?*

Summary: This workshop will explore what fractions are and the best ways to explore this concept with children. The NC expects children in KS1 to learn about halves, quarters and thirds. If they really understand what a fraction is, they don't need this ceiling, they can explore any fraction. We will also look at a sensible progression in fractions that prevents the catch up that most Year 6 teachers experience before SATs.

Delegates should bring a memory stick, if possible.

Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1D **Audience Primary**

Carol Handyside

Title: *The Art of Exploring Numbers*

Summary: A hands on workshop using the Spot On With Numbers resources to explore teaching number sense creatively, encouraging discoveries, seeing connections and working flexibly with numbers. Focusing on lower primary, we will think about laying firm foundations of mathematical thinking and providing strong support for late developers.

Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1E **Audience Secondary**

Nick Asker

Title: *What we have learned from the ICCAMS project*

Summary: The ICCAMS programme is a KS3 evidence-based intervention which supports maths teachers to more effectively use formative assessment when teaching algebra and multiplicative structures. Nick Asker is one of the PD leads who trained teachers and observed lessons through the randomised control trial and has run ICCAMS work groups for maths hubs. In this session he will share some of the ICCAMS approaches, examples of how students responded to them and how teachers reported a change in their pedagogical approaches.

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Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1F **Audience Secondary**

Alison Hopper

Title: *Lost in Transition – How to develop positive links across KS2 and 3*

Summary: In this session we will engage in key areas of mathematics which underpin mathematical development in Key Stage 3, exploring the practicalities and benefits of working across Key Stages to ensure continuity in curriculum and pedagogical approaches. We will consider how the representations and language we use can impact on the progress students make.

Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1G **Audience Post-16/Community**

Stella Dudzic

Title: *A new maths GCSE curriculum for post-16 resit students*

Summary: MEI received funding from the Nuffield Foundation to develop a new curriculum in maths for post-16 GCSE resit students with a greater emphasis on applying maths in realistic contexts. We worked on the project in 2019, reviewing relevant research and similar qualifications and developing example resources and exam papers. This session will explore some of the findings of the project.

Date: 15/04/2020 Time: 10.15-11.15

Session Code: 1H **Audience Post-16/Community**

Tom Roper

Title: *Simple, practical ideas for teaching A-level mechanics*

Summary: The session will offer some very simple, practical ideas to help with teaching A-level mechanics. The ideas have been used by the presenter to help make concepts and applications in mechanics clearer and more accessible, and lessons fun and interesting!

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Date: 15/04/2020 Time: 11.30-12.30

Session Code: **2A** Audience **General**

Darren Macey, Lucy Rycroft-Smith

Title: *A landscape to be explored: mapping maths education 3-19*

Summary: Cambridge Mathematics has been creating a flexible digital knowledge map of mathematics education from 3-19, aiming to reimagine the way that researchers, policy makers, designers and teachers communicate and share information to design and enact curricula. What insights could this map provide? And how might it change practice? *Delegates should bring a laptop.*

Date: 15/04/2020 Time: 11.30-12.30

Session Code: **2B** Audience **General**

Bobby Seagull

Title: *The Life-Changing Magic of Numbers*

Summary: For Bobby, maths was instrumental in unlocking the secrets of everyday life from the randomness of football results to organising his time. Using stories from his own life, Bobby brings his infectious enthusiasm to everything from the power of prime numbers controlling everything from credit card numbers to cicada hibernation habits.

Date: 15/04/2020 Time: 11.30-12.30

Session Code: **2C** Audience **Primary**

Janine Blinko, members of MA-ATM Primary sub-committee

Title: *Mathematics and English- are they really different?.. or maybe the same?*

Summary: In this practical session, based on work with primary teachers, we will identify parallels between reading/writing skills, and those which develop mathematical thinking, exemplify opportunities for using the classroom strategies used in English, to support mathematics learning, share examples of parallel classroom ideas which encourage creative thinking.

Date: 15/04/2020 Time: 11.30-12.30

Session Code: **2D** Audience **Primary**

Liz Gibbs

Title: *Problem solving and investigations around a 3 x 3 grid.*

Summary: This workshop will show you how to use a 3 x 3 grid with children from Year 1 to Year 6. During the workshop you will calculate totals in rows, then columns, leading to magic squares and algebra. You will work systematically with

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small numbers to find patterns and predict totals. We will unlock the secrets of the 3 x 3 magic square, so that you can apply your knowledge to any part-filled 3 x 3 magic square.

Date: 15/04/2020 Time: 11.30-12.30

Session Code: 2E Audience **Secondary**

Susan Okereke

Title: ***Pupil-led ICT in the maths classroom***

Summary: The last few decades have seen rapid developments in the availability and sophistication of technology, which has revolutionised our lives but isn't often mirrored in our classrooms. Allowing pupils to use ICT in the mathematics classroom can help bridge this digital divide, and provide exciting opportunities for instruction and exploration. This interactive workshop will give ideas and strategies on how to effectively facilitate pupil-led ICT in the maths classroom.

Delegates should bring a laptop, tablet, or smartphone.

Date: 15/04/2020 Time: 11.30-12.30

Session Code: 2F Audience **Primary KS2/Secondary KS3**

Nicola Coe

Title: ***Nicola's 3D Jigsaw - A challenging and practical approach to 3D isometric drawing.***

Summary: I created this puzzle to encourage students at Key Stage 3 to develop 3D awareness and problem-solving skills. This task has proved popular amongst teaching colleagues and students alike. Are you up for the challenge?

Date: 15/04/2020 Time: 11.30-12.30

Session Code: 2G Audience **Post-16/Community**

Douglas Butler

Title: ***Free Autograph 5 – ideas for teaching A level Maths and Further Maths***

Summary: Autograph was first launched in 1990, and its latest incarnation, version 5, has finally evolved into a freely available application. Come and meet its principle author and discover how Autograph can complement other free software and offer you a pedagogically rich environment for teaching and learning mathematics at KS5. Topics will include approaches to calculus, probability distributions, vectors 2D and 3D, complex numbers and differential equations.

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Date: 15/04/2020 Time: 11.30-12.30

Session Code: **2H** Audience **Post-16/Community**

Alison Eves, Sam Durbin

Title: ***Mathscraft: maths through making***

Summary: We will use craft ideas to make beautiful objects which both explain and intrigue, and can be used in your classroom to answer and provoke questions. Based on typical activities from the Royal Institution's Mathematics Masterclass programme, we will explore and gain deep mathematical insights on a number of topics.

Date: 15/04/2020 Time: 14.00-15.00

Session Code: **3A** Audience **General**

Tony Gardiner

Title: ***We need to talk about algebra***

Summary: Algebra provides the language for expressing, manipulating, understanding, and using mathematics. Evidence since the 1970s reveals consistent weakness acknowledging the importance of algebra, understanding key features, and teaching effectively. We consider how Years 5-10 lay foundations to proceed from arithmetic, fractions, negative numbers, algebraic laws, and simple formulae to serious algebra. This would be relevant to ITE, CPD and anyone who is interested in the subject and who is teaching at KS2, KS3, KS4 or KS5.

Date: 15/04/2020 Time: 14.00-15.00

Session Code: **3B** Audience **General**

Andrew Sharpe

Title: ***NRICH Hands-on Problem Solving***

Summary: The Hands-on Roadshow is a touring collection of NRICH's favourite resources. In this session our experienced Roadshow coordinator will share these free resources and how best to use them to develop students' curiosity, creativity, communication, and reasoning skills. We will get hands-on with the tasks as well as discussing the pedagogy and logistics of their use.

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Date: 15/04/2020 Time: 14.00-15.00

Session Code: 3C **Audience Primary**

Jenni Back

Title: *Exploring fractions*

Summary: This practical workshop will focus on the topic of fractions and draw on both the work I have been doing in Brighton connected with my new book 'Hooked on Mathematics' and also that connected with the Nuffield funded project which follows on from 'Making Numbers'. I will share some of our findings relating to practical activities in the teaching of fractions and offer guidance from the research literature as well as some examples of practical tasks to use with children. I will also outline the approach to developing a programme of study described in Hooked on Mathematics.

Date: 15/04/2020 Time: 14.00-15.00

Session Code: 3D **Audience Primary**

Katherine Milner

Title: *Exploring Fluency – going beyond rapid recall*

Summary: The word 'fluency' is now regularly used following its inclusion in the aims of the National Curriculum but what does it mean, what does it look like and how is it connected to reasoning? This session will provide an opportunity for exploration of 'fluency' through practical tasks that can be used in the classroom.

Date: 15/04/2020 Time: 14.00 – 15.00

Session Code: 3E **Audience Primary/Secondary**

Ed Southall

Title: *Geometry Juniors*

Summary: A talk around the importance of discourse when teaching geometry to students – exploring properties of shapes through observation, discussion and deduction while maintaining a positive and constructive teacher-led environment.

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Date: 15/04/2020 Time: 14.00-15.00

Session Code: 3F Audience **Secondary**

Elena Nardi, Lina Kayali, Angeliki, Stylianidou, Athina Thomas

Title: ***Mathematics at the forefront: Challenging teachers' pedagogical and mathematical discourses through MathTASK and CAPTeaM activities***

Summary: The MathTASK and CAPTeaM projects see engaging school and university teachers with challenges they are likely to face in class as an effective professional development approach. We design situation-specific tasks that emulate these challenges (mathematical reasoning, classroom management, digital resources, inclusion) and we engage teachers with these tasks in reflective workshop settings. Participants will engage with classroom episodes that evidence mathematical contributions which are made by students with a physical disability (e.g. are visually or hearing impaired) and have the potential to shift classroom mathematical discourse towards creatively unexpected turns and bring learning benefits to all in class.

Delegates should bring a laptop, tablet or smartphone.

Date: 15/04/2020 Time: 14.00-15.00

Session Code: 3G Audience **Post-16/Community**

Michael Fox

Title: ***Euclidea: geometry challenges***

Summary: Description: Euclidea is a geometric construction game. It has 127 challenges, from very easy to really hard. Its underlying idea dates from about 1890, when Lemoine found that many standard constructions can be done far more economically. We look at some of his discoveries and tackle one or two Euclidea problems.

Euclidea and Pythagorea apps would be useful; these can be downloaded via the app store.

Date: 15/04/2020 Time: 14.00-15.00

Session Code: 3H Audience **Post-16/Community**

Andrew Taylor

Title: ***What makes an exam accessible, and why does it matter?***

Summary: Teachers, and exam boards, often talk about accessibility and, too often, it is wrongly used as a euphemism for easy. In this session, Andrew will explore what makes an accessible question, and how the design principles of high stakes qualifications may be applied in the classroom.

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Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4A Audience General

David Crawford

Title: *It's a Kind of Magic*

Summary: In this session I will present a selection of mathematical tricks which could be used to add a bit of colour to Maths lessons in school. There will be plenty of audience participation so bring a pen, paper, calculator if you want and your enthusiasm.

Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4B Audience General

Sue Johnston-Wilder

Title: *What are we to do about maths anxiety?*

Summary: Maths anxiety is acquired, disabling, usually hidden and unrecognised, sometimes manifesting in poor behaviour or avoidance strategies, more often as an emotional handbrake on mathematical progress across the attainment range. We will consider strategies for use in the classroom, across a school or college, or with members of staff.

Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4C Audience Primary

Katie Crozier, Clare Gerrard

Title: *Numberless Word Problems: How to encourage mathematical reasoning and avoid 'number-plugging'*

Summary: When presented with word problems, there is a conflict between context and quantity. Children often resort to 'number-plugging' and default to the favoured operation of addition. During this session, Katie and Claire will share some tried and tested class teaching strategies to encourage children to think more about the context of word problems and to use mathematical thinking to suggest potential solutions. Participants in the workshop will explore different ways of presenting word problems, including removing the numbers, to help children make sense of the maths involved and reach well-reasoned, accurate solutions.

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Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4D Audience EYFS/Primary KS1,KS2

Liz Woodham

Title: *The Sky's the Limit*

Summary: At NRICH we aim to provide all children with the opportunity to explore rich mathematical contexts, pose their own questions, represent their thinking and share their reasoning. In this session we will offer accessible and engaging starting points to work on together and see how far we can take them. Along the way we will discuss and reflect on classroom cultures which nurture confident children who enjoy mathematics.

Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4E Audience Secondary

Charlie Gilderdale

Title: *The sky's the limit*

Summary: At NRICH we aim to provide all students with the opportunity to explore rich mathematical contexts, pose their own questions, represent their thinking and share their reasoning. In this session I will offer accessible and engaging starting points to work on together and see how far we can take them. Along the way we will discuss and reflect on classroom cultures which nurture confident students who enjoy mathematics.

Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4F Audience Secondary/General

Tony Robin

Title: *Some Unfamiliar Problems.*

Summary: Including two problems that split the plane into an unusual number of regions. And some searching questions I have used for mock interviews, to see how students can use their knowledge in unfamiliar situations.

Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4G Audience Post-16/Community

Steve Hewson

Title: *Exploring Mathematical Creativity*

Summary: Many people who love mathematics see it as vibrant and full of creativity. But what exactly is Mathematical Creativity? We'll explore ways in which one might be mathematically creative. We'll discuss ways in which creativity can be injected into the mathematics classroom. We might even be mathematically creative ourselves!

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Date: 15/04/2020 Time: 15.15-16.15

Session Code: 4H Audience Post-16/Community

Gerry Leversha

Title: *What is the point of teaching Geometry?*

Summary: This is a very individual attempt to answer this question, from the viewpoint of a classroom teacher who believes that enrichment is vital to school mathematics. It will be accessible to anyone involved in teaching geometry from KS2 up to A-level. It will involve some hands-on work and will, I hope, avoid many of the usual clichés and suggest some unexpected benefits in teaching the subject, as well as ways to approach it.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5A Audience Secondary/General

Adam McBride

Title: *Squares*

Summary: A tour of some of my favourite properties of squares; some perfect, some magic and some simply curious.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5B Audience SEND

Pete Jarrett

Title: *Maths and Specific Learning Difficulties*

Summary: The BDA Dyscalculia committee has recently published a new definition of dyscalculia. This presentation will unpick this definition and also explore barriers to maths learning that can be attributed to other difficulties such as dyslexia, ADHD and dyscalculia.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5C Audience Primary

Ruth Bull

Title: *Stimulating Curiosity in the Primary Classroom: Ooh that's interesting! How does that work? Will that always happen? Why does that happen?*

Summary: This workshop will share some starting points to spark learners' curiosity. Participants will have the opportunity to explore problems 'new and old' which will prompt questions in the primary classroom. Ideas shared will be easily implemented and adapted across the primary age range to promote mathematical thinking and problem solving.

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Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5D Audience Primary/KS3

Debbie Morgan

Title: *Teaching for mastery and problem solving*

Summary: All teachers want their children to be able to solve problems in mathematics but how is this achieved? This session will take a fresh look at problem solving and how this is developed within the context of Teaching for Mastery. It will be suitable for Primary and KS3.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5E Audience Secondary

Gemma Brittle, Elizabeth Bridgett

Title: *Using concrete manipulatives in the secondary classroom*

Summary: There continues to be much debate surrounding the use of concrete manipulatives in the classroom both in research and amongst teachers. So, what is the verdict? If they are useful, what are they useful for? If not, why not? Delegates can reflect on and share their own experiences as we do the maths using the manipulatives and explore the research into their use in the classroom.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5F Audience Secondary

Carol Knights

Title: *NCETM Secondary Mastery PD Materials*

Summary: Last year the NCETM published a set of PD materials aimed at KS3 mathematics teachers. In this session you will hear a little about the rationale behind the materials, find out how some teachers are using these within professional development sessions with colleagues, and have opportunities to consider ways of using them.

Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5G Audience Post-16/Community

Evelyn Hardy

Title: *Let's Play with Lego*

Summary: We will divide the session into three parts; first an explanation of the OR and why we think it's important for teachers to talk to students about it; second a hands-on demonstration of one of our workshops getting the teachers to play with Lego and experience our workshop from a student's perspective; third an overview of the resources and support we offer to teachers.

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Date: 15/04/2020 Time: 16.30-17.30

Session Code: 5H Audience Post-16/Community

Jim Simons

Title: *These Are a Few of My Favourite Things*

Summary: I shall talk about some mathematics that I love to explore with A-level students: all beautiful, all with pedagogical power, some featuring cool Geogebra demos, and none in the text books. Even if you are an experienced teacher, I hope you will find some of it novel and exciting.

THURSDAY 16th April

Date: 16/04/2020 Time: 9.00-10.15

Session Code: PLENARY Audience ALL

Jo Morgan, Award-winning maths blogger, TES Maths Panel member, AQA Expert Panel member.

Title: *Maths Evolution*

Mathematics is timeless. But the maths we teach in the classroom changes slowly over time. From casting out the nines and the rule of three through to exploding dots and rediscovered methods for solving quadratic equations. Let's have fun exploring some old and new school mathematics.

Date: 16/04/2020 Time: 10.45-12.00

Session Code: PLENARY Audience ALL

Craig Barton, Advanced Skills Teacher, TES Secondary Maths Adviser, creator mrbartonmaths.com

Title: *Misconceptions in Mathematics*

30% of the answer's students give on my website diagnosticquestions.com are wrong. With over 100 million answers given by students all around the world, that is a lot of mistakes and misconceptions. In this session we take a topic and delve into some of the most persistent, surprising and interesting misconceptions students hold. Do they change by age? Do they depend on the way the question is phrased? We then think about how we might help our students resolve them. This is an interactive session with plenty of opportunities to play *Guess the Misconception!*

The Mathematical Association reserves the right to amend the programme if circumstances beyond its control occur.