SESSION A - WEDNESDAY 3.30–5.00PM

A1 Derek Ball, Barbara Ball
KS2, KS3, KS4, KS5, T, A

L – A Mathemagical Adventure

ATM has produced a new version of *L*, the ultimate mathematics adventure game, for Windows. *L* has links with the past, having been first written for a BBC micro in the eighties. This version – like the original – is text-based, which means it is far more exciting than most adventure games, because you make your own pictures. Those unfamiliar with *L* might like to know that *L* links various mathematical problems by means of the exploration of a palace in which Runia is imprisoned by Drogo robots. None of the many problems involves advanced mathematical content, but considerable ingenuity is required to rescue Runia. Derek was one of those involved with the production of the original version of L and will give you a flavour of the program during the session. Barbara used *L* extensively in her secondary mathematics teaching and will give you a flavour of how it inspired her students. The session is being held early in the conference, so that you have plenty of time to discuss *L*, have a further look at it, buy it and tell your friends and colleagues about it.

A2 Jenny Gage
KS3

The Maths of Churches, Mosques, Synagogues and Temples

Places of worship can provide us with a rich source of mathematical activity. In this session, we will look at symmetry, geometrical construction, and pattern, and use them to motivate activities across the mathematical curriculum. Links with other curriculum areas (eg. art, RE, history) will also be emphasised, showing how maths underlies so much around us - truly 'joined up', multi-cultural mathematics! Places of worship (like mathematics) are full of symbols and we will also discuss the nature of symbols and how they help form our understanding.

A3 Michael Fox
KS5, T

Some problems in 3-D geometry

Some 3-D problems can be tackled with plane diagrams that are easily drawn and can be adapted for Sketchpad, Cabri, etc. The session includes finding oblique sections of prisms, pyramids and cones: constructing the true elliptic section of a cone with its foci and directrices. Amongst other problems we shall investigate spheres associated with an arbitrary tetrahedron, including some little known properties of spheres that touch the four extended faces.

A4 David Fielker
KS2, KS3, KS4, KS5, A

Joined-up shapes

■ **DOUBLE SESSION WITH B6**

Tessellations are usually made from joining up regular polygons, sometimes with 'gaps'. What if the polygons are irregular, or 'star' polygons? Is this art or mathematics? What mathematics is involved anyway? How does this fit into the curriculum?

A5 Tony Harries
KS1, KS2, A

Using representations in Mathematics

■ **DOUBLE SESSION WITH B8**

Over the last couple of years a group of us at Durham University have been developing a suite of programmes for use with primary school children – exploring the "big ideas" within arithmetic. The programmes fall into three groups – early counting and representation, addition and subtraction, multiplication and division, and fractions. In the first session we will look at the principles which underpin the development of the programmes. In the second session we will work on developing teaching sequences which may have these programmes as a central resource. First session mainly demonstration, second session **delegates need own laptop**.

A6 Alison Clark-Wilson & Carol Knights
KS4

Motivating C/D borderline mathematics students: The GE STEMNET Achievement in Mathematics London Pilot

This session will enable delegates to become familiar with the resources developed for the Achievement in Mathematics London Pilot project, funded by General Electric (GE) as part of the UK STEM initiative. Authored by Barbara and Derek Ball, Alison Clark-Wilson and Carol Knights in collaboration with the financial news channel CNBC Europe, they focus around a video of a day in the life of a TV Production Assistant. Delegates will have the opportunity to review the resources during a practical session and find out how to organize workshops for targeted students in collaboration with GE Ambassadors. **Delegates will need laptop**.

SESSION A - WEDNESDAY 3.30–5.00PM

A7 Jonny Griffiths — KS4,KS5,T

Joining up polygons

You are invited to join an investigation into certain polygons (that I call 'siders') that link helpfully with each other. Hopefully we will come up with some ideas that are new and exciting. This is a chance to do some interesting maths for the sake of it, but there are implications too for the teaching of geometry and angle in the classroom. The emphasis will be on play, discussion and group work, and the maths will be at GCSE/AS Level.

A8 Keith Windsor — KS2,KS3

Paired Puzzles

Working in pairs provides opportunities for learners to solve, simplify, develop and invent puzzles. Join in this practical session; prepare to engage in some joined-up thinking with challenging shape activities for the KS2/KS3 classroom. You will be able to continue the tasks you have started in the workshop during the conference.

A9 Joan A. Cotter — KS1,A

The AL Abacus helps young pupils join up maths with everyday knowledge

This abacus joins up with pupils' experiences, unlike abstract number lines. Quantities are seen immediately because of the 10s and 5s groupings. Adding is joining quantities; not a counting ritual. Visual images aid memorising facts. To learn algorithms, pupils use the reverse side, where they swap 1 ten for 10 ones, 1 hundred for 10 tens, and 1 thousand for 10 hundreds. Come and learn about the research on this kinaesthetic and visual tool.

A10 Liz Russell — KS4

Connecting the learning

Take a fresh look at GCSE; it can be taught in themes which connect ideas and in an active way that makes concepts memorable. This workshop will have ideas and activities that you can take and use in the classroom straight away.

A11 Geoff Gibbs — KS4,T

Functional Maths - What will it mean to you?

The session will look at what is currently being trialled by OCR and how this might develop. This will be an opportunity to consider what impact the introduction of Functional Skills in Mathematics will have for the classroom teacher and how the requirements of Functional Skills might be met.

A12 Rachel Gibbons & members of the Equals Team — KS3,KS4,KS5

Developing Numerate Citizens'

What basic mathematical knowledge does the ordinary citizen need to participate in society? A discussion study of news items including mathematical information.

A13 Tandi Clausen-May — KS2,KS3

Teaching and Assessment – Joining up the seams

There is a lot of talk nowadays about 'assessment for learning', 'formative assessment', 'diagnostic assessment', and all the rest of it. But can we really integrate assessment with learning, so that the pupils are assessed as they learn, and learn as they are assessed? Well… it's what teachers do all the time, of course, but at the NFER we have been working on some ideas using digital assessments in mathematics to teach, and to test, both at once. Can we bridge the gap between teaching and assessment?

SESSION B - THURSDAY 9.00–10.30AM

B1 Bob Vertes & Alan Bloomfield
KS2,KS3, KS4, KS5, T, A

People Maths . . . it's got to be joined up!

The second ATM People Maths book will be appearing at the conference. We will consider in more detail a few of the newer activities within the book. This will be an active session with lots of chance to join in and join up with others in working kinaesthetically on problems and puzzles.

B2 Trish Morgan
KS1, A

Motivating your pupils using the Primary Mathematics Challenge

The Primary Mathematics Challenge takes place every November. This workshop will look at problems from recent challenges and look at how pupils in the final one or two years can benefit from the challenge and how schools can use the challenge to raise the profile of maths within the school.

B3 Derek Ball
KS4, KS5, A,T

Dot-to-dot decimals and other stories

■ **DOUBLE SESSION WITH C2**

I ran a single-session workshop at last year's ATM conference, which participants afterwards described as thoroughly disorganised, even though they greatly enjoyed working together on understanding recurring decimals a bit better. This year I am offering a two-session workshop, in which we will again explore recurring decimals, but probably in a somewhat different way from last year. We shall also explore some geometrical themes. The joined-up mathematical thinking will be done more by the participants working in groups than by the session leader. The ideas will be mainly relevant to key stages 4 and 5, but the workshop will be of no conceivable value for turning Ds into Cs – or even Cs into Ds. **Please bring a calculator**.

B4 John Holden
KS3,KS4,KS5,T,A

Enhancing Excel as a Teaching Tool

Excel does not cope well when required to graph continuous data. This session will show how using an Excel add-in, teachers and pupils can produce histograms, frequency diagrams, and box-whisker plots easily. Other areas of mathematical functionality that will be shown include sampling and decision mathematics capabilities.

B5 Jenny Murray & Liz Woodham
KS2,KS3,A

Joining up Key Stages 2 and 3

Come and do some mathematical problems and puzzles at this workshop session! We have been collecting non-threatening problem-solving material for classroom use, suitable for Key Stages 2 and 3. The resources are designed to encourage pupils to think mathematically and talk to each other as they work on a problem together. Most of the activities are in the form of 'Puzzle Cards' with equipment to manipulate but some material is taken from the NRICH website and elsewhere. We hope to stimulate discussion between participants by working on the resources together.

B6 David Fielker
KS2,KS3,KS4,KS5,A

Joined-up shapes

■ **DOUBLE SESSION WITH A4**

Tessellations are usually made from joining up regular polygons, sometimes with 'gaps'. What if the polygons are irregular, or 'star' polygons? Is this art or mathematics? What mathematics is involved anyway? How does this fit into the curriculum?

B7 Douglas Butler
KS3,KS4,KS5,T,A

Autograph: lesson plans for all occasions

A chance to explore the latest version of Autograph through a series of well-tried lesson plans for KS3 and 4, and for AS/A2. This will include some new approaches to the quadratic, the use of imagery and graphs, a play with 3D coordinates, and the chance to see how much fun there is in data handling and statistics in the coursework after-life! AS and A2 topics will include probability and sampling, and a dynamic look at vectors in 2D and 3D. www.autograph-maths.com

SESSION B - THURSDAY 9.00–10.30AM

B8 Tony Harries
KS1,KS2,A

Using representations in Mathematics

■ **DOUBLE SESSION WITH A5**

Over the last couple of years a group of us at Durham University have been developing a suite of programmes for use with primary school children – exploring the "big ideas" within arithmetic. The programmes fall into three groups – early counting and representation, addition and subtraction, multiplication and division, and fractions. In the first session we will look at the principles which underpin the development of the programmes. In the second session we will work on developing teaching sequences which may have these programmes as a central resource. First session mainly demonstration, second session **need own laptop**.

B9 Adam McBride
KS3,KS4,KS5,T,A

Problems ! Problems !

I shall look at a few of my favourite problems, for which the only real prerequisite is the ability to count and to think logically. Many of the problems will deal with numbers, involve no advanced concepts and should therefore be accessible to students at KS3 and beyond (and to their teachers !). The crowning glory will be a self-contained discussion of a gem from the International Mathematical Olympiad, but don't let that frighten you.

B10 Dave Miller & Doug Averis
KS3,KS4

At the board, on the desk, in the head: secondary mathematics pedagogy with an interactive whiteboard

As part of our research for the NCETM we have produced a CD of what we consider good ideas for use in the secondary mathematics classroom. In this session we would like to discuss appropriate pedagogy taking examples from the CD.

B11 Doug Williams
KS1,KS2,KS3,KS4,T,A

Multiplication, Meaning & Times Tables

This workshop is a multiplication journey that begins with children first arranging objects in equal rows - an array model - and takes us through to the visualisation of abstract algebraic formulas. It explores activities which use concrete objects, semi-concrete representation such as graph paper and virtual representation through software, to simultaneously develop meaning in multiplication and facility with times tables. Although there will be activities for you to use tomorrow, the session will also stimulate thought about planning the multiplication journey through the school so that more students are more successful at multiplication matters.

B12 Farzana Alsam, Ewan Russell & Sidney Tyrrell
KS3,KS4,KS5,A

More Maths Grads

More Maths Grads is HEFCE pilot project which aims to increase the numbers studying for degrees in the mathematical sciences by taking activities into schools which will engage and sustain the interest of pupils in the subject, and also by supporting teachers in their professional development. In addition, the project will have a strong theme emphasising the career opportunities that are open to graduates in the mathematical sciences. This session offers participants the opportunity to take part in activities similar to those run in schools – so come for enrichment, enjoyment and a chance to learn how the project may be able to help you.

B13 Dave Hewitt
KS2,KS3,KS4,A

Grid Algebra: new KS2 to KS4 software from ATM

■ **DOUBLE SESSION WITH C13**

A chance to explore the new software from ATM suitable for primary and secondary schools. Topics addressed will include mental arithmetic, interpreting and calculating arithmetic expressions, equivalent expressions, learning formal notation, introducing 'x', substituting, inverse, order, expanding brackets, factorising and solving equations. The close association between physical movements round a grid and arithmetic operations helps students interpret and work with quite complex expressions. The first session will involve 'teacher-led' activities using an interactive whiteboard and the second session will be hands-on exploration on computers. Discussion of issues will take place throughout both sessions. **A commitment to both sessions is required**.

B14 Tony Gardiner
KS2^{+},KS3,KS4,General

Using the series – 'Extension mathematics'

We will introduce this series of books, explore why they are needed, and explain some of the Do's and Don'ts that have emerged from the experience of those who have worked with the material in the past 6 months.

SESSION C - THURSDAY 11.00–12.30PM

C1 Rod Bond *Using Industry, Commerce, Higher Education and the Community to promote Mathematics to Key Stages 4/5 students*

KS4,KS5,A

How can we inspire and enthuse young people to study Mathematics? The session will give participants the opportunity to discuss how workers in Industry, Commerce and Higher Education can be used as a resource to do this by considering a number of case studies. In addition we will explore ways in which tourist attractions and heritage sites can be used as an exciting learning environment for developing mathematical skills. We will examine the results of a project jointly organised by the Mathematics Education Centre, Loughborough University, the Further Mathematics Network and the Snibston Discovery Park, Leicestershire.

C2 Derek Ball

KS4,KS5,A,T

Dot-to-dot decimals and other stories

■ **DOUBLE SESSION WITH B3**

I ran a single-session workshop at last year's ATM conference, which participants afterwards described as thoroughly disorganised, even though they greatly enjoyed working together on understanding recurring decimals a bit better. This year I am offering a two-session workshop, in which we will again explore recurring decimals, but probably in a somewhat different way from last year. We shall also explore some geometrical themes. The joined-up mathematical thinking will be done more by the participants working in groups than by the session leader. The ideas will be mainly relevant to key stages 4 and 5, but the workshop will be of no conceivable value for turning Ds into Cs – or even Cs into Ds. **Please bring a calculator**.

C3 Richard Phillips

KS2,KS3,KS4

Maths and photos

This session considers various ways in which photographs help our understanding and teaching of mathematics. The session begins with a talk looking at some historical landmarks and illustrating some of the ways photos provoke discussion, pose problems and provide data. This is followed by an opportunity to try some activities involving problem posing and problem solving with photos. If they wish, participants may bring along some of their own photographs to work on. These should be on paper, not on digital media.

C4 David Cain

KS2 upwards

Mathematical Journeys – Some Departure Points. 61: Frog Hopping & 62: Fleas

Two classic Body Maths problems. Physical action, group discussion, lots of fun and surprisingly satisfying mathematical structures!

C5 Paul Stephenson & Meera Senthilingam

KS1,KS2,KS3,A

Geoff Giles' Legacy

In the use of manipulatives for the learning of mathematics in the twentieth century, the name of Geoff Giles will be remembered alongside those of Maria Montessori and Z P Dienes. Even had we not had the good fortune to know Geoff personally, his influence on our touring maths lab, The Magic Mathworks Travelling Circus, would have been all-pervasive. Over the last 12 months we've filmed children doing Giles-inspired activities. Come and see this footage but also (of course) try the activities yourselves.

C6 Joe Watson

KS4,KS5,T,A

Look at it this way

When you have solved a problem, it's sometimes helpful to look back over it to see if there is an easier way. (Several writers on problem solving describe 'reviewing' or 'looking-back' as a useful strategy – it can suggest ways of tackling similar problems in future). A number of problems will be provided which are 'easier, if you look at them in the right way' (But what IS the right way - and why didn't I think of that earlier … ?). Example: A king in ancient times left his fortune of gold bars to his children. (He was a PC king, so included his daughters…). The eldest was to have 1, plus one seventh of the remainder when that had been removed, the next oldest had 2, plus 1 seventh of the new remainder, the next 3 … and so on. It turned out that they all received the same amount. How many children were there and how many gold bars in total did the king leave to them?

C7 Paul Metcalf

KS3,KS4

The changing face of GCSE Mathematics

The talk will take a look at the changing face of GCSE mathematics and attempt to pull together some of the many changes that are envisaged for assessment at the end of Key Stage 4. The session is intended to inform as well as share ideas so please feel free to contribute.

SESSION C - THURSDAY 11.00–12.30PM

C8 Heather Mendick & David Wells
KS3,KS4,KS5,T

'Geek' identities and mathematics

Popular culture clichés associate 'nerdiness' and 'geekiness' with mathematics - from Russell Crowe's social awkwardness as John Nash in a Beautiful Mind, to the mathematics and physics of rocket science that confused the 'beauties' and captivated the 'geeks' in Beauty and the Geek. In this session we will explore these images and think about the ways that young people learning mathematics make sense of them. We are particularly interested in the ways that these identities relate to gender, social class and ethnicity.

C9 Michael de Villiers
General

Mathematical Applications, Modeling & Technology

The paper critiques 'decontextualised' teaching, and instead argues strongly for using modeling as a teaching approach with the real world contexts being used as a starting point. Examples from the elementary to the high school will be shown, and the role of technology in a modeling approach will be discussed.

C10 William O. Lacefield *Fractions Don't Have to Cause Frenzy: Using Performance Tasks to Strengthen Conceptualization in the Primary Grades*
KS1,KS2

Unfortunately, fractions are known to provoke anxiety in people of all ages. Primary teachers have the power to help pupils avoid negative dispositions toward fractions by planning for engaging learning opportunities. Meaningful performance tasks have been shown to nurture young learners' understanding of fraction concepts. Participants in this session will experience and analyze a number of tasks designed for the primary classroom.

C11 Keith Jones & Kate Mackrell
KS2,KS3,KS4,KS5,T,A

Thinking in 3D with dynamic visualisation software

Thinking in 3D involves not only mental images related to external representations, but also various visualisation processes and abilities. In this workshop we explore the ways in which thinking in 3D might be supported through using 3D software applications such as Cabri 3D and small software applications developed in the DALEST project. **Delegates should bring their own laptops running Windows XP or Vista**. Demo Cabri 3D and dynamic visualisation software will be provided.

C12 Sue Cronin & Jan Winter
All KS from a ITE perspective

What makes a good Initial Teacher Education Mentor?

An AMET session for those interested and/or involved in initial teacher education. Using case studies and examples of incidents from experience, this session will consider what makes good ITE mentoring in mathematics. Whether you are a primary or secondary teacher who works with 'beginning teachers' in your school, or an ITE tutor come and share your views about good practice.

C13 Dave Hewitt
KS2,KS3,KS4,Advisory

Grid Algebra: new KS2 to KS4 software from ATM

■ **DOUBLE SESSION WITH B13**

A chance to explore the new software from ATM suitable for primary and secondary schools. Topics addressed will include mental arithmetic, interpreting and calculating arithmetic expressions, equivalent expressions, learning formal notation, introducing 'x', substituting, inverse, order, expanding brackets, factorising and solving equations. The close association between physical movements round a grid and arithmetic operations helps students interpret and work with quite complex expressions. The first session will involve 'teacher-led' activities using an interactive whiteboard and the second session will be hands-on exploration on computers. Discussion of issues will take place throughout both sessions. **A commitment to both sessions is required**.

C14 Adrian Oldknow & Jane Imrie
KS2,KS3,KS4,KS5,T

The ATM and the MA have been working with Becta to provide support for teachers embedding ICT into mathematics learning and teaching, such as the roadshows. The first ICT & Mathematics conference to be run by the National Centre for Excellence in Teaching Mathematics takes place on March 12th in London. Its aim is to inform the future provision of professional development for mathematics teachers. The session will illustrate examples of interesting and innovative practice such as that reported at the NCETM conference and explore opportunities for the future.

SESSION D - THURSDAY 4.00–5.30PM

D1 Liz Woodham & Lynne McLure — KS1,KS2

Rich tasks - Rich activity – Rich outcomes

Mathematics is about noticing patterns, making conjectures, explaining and proving. It is about process AND content, knowledge AND understanding, number AND algebra, specialising AND generalising - making connections. This session will look at problems that encourage this joined-up thinking. We have mapped over one hundred rich problems from the NRICH website to the New Framework and National Curriculum. This mapping document offers teachers a basis from which to plan a process-focused experience for learners that links to topic-based content. **Delegates with their own laptops may find them useful but access to a computer is optional.**

D2 Colin Foster — KS3,KS4

Joined-up Dots

Co-ordinates provide a way of 'joining up' algebra and geometry. Come along to try out some tasks that work on this connection and share your own ideas.

D3 Syd Houghton-Hill — KS1, KS2, KS3,KS4,KS5,T,A

138 reasons to access Teachers TV

This session will explore and illustrate the scope of online, 'on demand' programmes available from Teachers TV for supporting the CPD of teachers of mathematics. As well as being a broadcast digital TV channel, one of education's best kept secrets is a major website that makes thousands of state-of-the-art, free, downloadable videos instantly available. Come and watch and discuss the relevance of just a sample of the 138 programmes currently available dedicated to enhancing the teaching of mathematics.

D4 Ian Sugarman & Melvyn Rust — KS1, KS2,KS3

What is maths software FOR?

With the help of the *NumberGym* menu of activities, we will explore the purposes of maths software in the classroom with a special emphasis upon setting children free to pursue their own ideas – a rare experience!! An active session in which you will be able to sample the highlighted activities.

D5 Tom Button — KS4,KS5

Joining-up mathematics by using ICT dynamically

Many computer programs (such as Excel, Autograph and others) offer users the opportunity to display mathematics in algebraic, graphical and numeric forms. These multiple representations allow students to see the connections between different topics. This can be very powerful in improving students understanding, especially when the related forms can be changed dynamically. This session will demonstrate how this can be achieved using various examples from GCSE and A level mathematics.

D6 NCETM — KS1, KS2, KS3,KS4,KS5,T,A

Mathematics Matters

The Mathematics Matters project is a year-long project (May 07-Mar 08) to engage with the whole community of mathematics educators in collecting evidence of learning mathematics and deriving and articulating successful practices of teaching. In this session delegates will have the opportunity to hear the outcomes of the debate and to contribute evidence to the final report. In addition, there will be an opportunity to update on the NCETM major project 'Researching Effective CPD in Mathematics Education'

D7 John Silvester — KS5,T,A

Discovering theorems by dynamic geometry: reflecting circles

I shall attempt to retrace my steps in the discovery of some theorems (which may possibly be new) about reflecting circles, and related matters. These were found by a combination of experiments with Geometer's Sketchpad and searches in various online mathematical resources. Proofs of the theorems followed much later, and will be sketched if time and audience interest allow.

SESSION D - THURSDAY 4.00–5.30PM

D8 Jean-Jacques Dahan — KS3,KS4,KS5,T,A

Modelling Cha-Cha dance with Cabri 2 Plus and Cabri 3D

We will construct the animation of two points modelling the basic steps of the Cha-Cha: the method is based on the intersections between 3 parallelograms and a animated line. We will use basic geometric constructions and translations. These constructions can be done with either Cabri 2 Plus or with Cabri 3D. Using especially Cabri 3D, we will create a character who will dance the Cha-Cha and so become a teacher for those who don't know how to dance it. We will have the opportunity to learn very quickly the principal features of Cabri 3D.

D9 John Rigby — General

Penrose and The Persians

Did Islamic craftsmen in the middle east construct non-periodic tiling patterns 800 years ago? There is currently a debate about this, and about who deserves the credit for first suggesting that they did. Come and marvel at medieval masterpieces of design, and find out how you too can create complex and exciting interlacing patterns; then perhaps you will make up your own mind about the answer to the question.

D10 Stuart Naylor — KS2, KS3, A

Concept Cartoons for teaching and learning in mathematics

Concept Cartoons are an innovative approach to teaching and learning. They promote classroom dialogue by presenting alternative views of mathematical situations. Research shows that they are accessible, challenging and motivating for pupils. Teachers find them easy to use in the classroom, and pupils find them highly engaging. This session will give you an opportunity to look at examples of Concept Cartoons and consider how and when you might use them in your teaching.

D11 Bob Francis — KS4,KS5,T

Fabulous Fibonacci For All

Most folk can recall the Fibonacci Sequence and how it is generated, but that is just the tip of the iceberg! In this session delegates will discover a wealth of mathematics and applications that arise from further study of the sequence. Ideas in mathematics which may be "joined up" through Fibonacci include "the golden ratio", convergence of sequences, mathematical induction, quadratic equations, spirals, difference equations, continued fractions and lots more.

D12 Nick Lord — KS5, T

Looking Forward!

A look at several "mathematical miniatures" for sixth formers aimed at joining together secondary and tertiary themes. Please don't come expecting module-specific ideas – this lecture will be further mathematics off-piste!

D13 Jenni Back, Sue Cronin & Jan Winter — All KS from a ITE perspective

Joined up Pedagogy?

An AMET session for those interested and/or involved in initial teacher education. How does the teaching of initial teacher education students reflect the pedagogies that we are advocating that they use with their pupils? Is there a tension between coverage and deeper learning that reflects what we see in classrooms? The session will focus on these questions.

D14 Jacqui Bowers & Rachel Gibbons — KS3,KS4,KS5

SMILE: mathematics classrooms for the 21st century

What mathematics is appropriate for 21st century classrooms and how should it be presented? Participants will have a brief taste of participating in a SMILE classroom and then discussing the benefits of this way of working.

D15 Rachel Read — KS3,KS4,KS5

Engaging Ideas

During the session we will investigate and try out a wealth of resources developed to encourage pupils to engage and enjoy their maths lessons; with the emphasis on problem solving, creativity and collaboration. The resources have been developed through Gatsby funded research and every attendee is free to go away with as many of the resources and ideas for themselves as they wish… **just bring a large memory stick!**

SESSION E - FRIDAY 9.00–10.30AM

E1 Graeme Brown & Charlie Gilderdale
KS3,KS4

Rich tasks - Rich activity – Rich outcomes

Mathematics is about noticing patterns, making conjectures, explaining and proving. It is about process AND content, knowledge AND understanding, number AND algebra, specialising AND generalising - making connections. This session will look at problems that encourage this joined-up thinking. We have mapped over one hundred rich problems from the NRICH website to the Framework and National Curriculum. This mapping document offers teachers a basis from which to plan a process-focused experience for learners that links to topic-based content. **Delegates with their own laptops may find them useful but access to a computer is optional**.

E2 Barbara Ball
KS3,KS4,KS5,T,A

Functional Mathematics in the classroom

■ **DOUBLE SESSION WITH F2**

How can teachers help learners acquire joined-up thinking about mathematics by developing 'the skills and confidence to apply, combine and adapt their mathematical knowledge to new situations in their life and work', as demanded by the Functional Skills Standards? Do you give your students 'Functional Mathematics' problems (i.e. 'real-life' problems which are no longer about real life when brought into the classroom) or do you help them to function mathematically? As a result of Mike Ollerton's seminar at the 2007 ATM conference a new ATM publication offers activities that help learners to function mathematically. In these two sessions you will work on some of these activities. We shall also discuss what teachers can do to encourage learners to function mathematically.

E3 John T. Harrison
KS1,KS2

Modelling the Decimal Number System

Studying a model of an abstract system has always been known to be an aid to understanding that system. A substantial number of children have difficulty with current methods of presenting the decimal number system, and this session will review a number of different ways of modelling the decimal number system. The methods reviewed will cover the number line, number square, *Cambridge Square*, *Split Cambridge Square*, *Folding Cambridge Square*, *Helical Number Line*. Contributions from the participants will be welcome.

E4 Stella Dudzic
KS4,KS5

Learning from failure, not failing to learn

"It is the true nature of mankind to learn from mistakes, not from example." (Fred Hoyle) This session will look at ways of using mistakes and misconceptions to promote deeper understanding. How can we help students to learn from mistakes and deal with misconceptions without making them feel like failures? **Having a laptop with you would be helpful for this session**.

E5 Alison Clark-Wilson
KS3,KS4,KS5,T,A

TI-nspire : Introducing a new ICT resource for mathematics: A report of the UK Pilot project 2007-8

In September 2007, five state secondary schools began to trial the use of TI-nspire handhelds and software in Key stage 3 and 4 mathematics classrooms. This session will report on the outcomes of this UK pilot and delegates will have the opportunity to view classroom video footage and look at students' outcomes. In particular, the focus will be on how the use of TI-nspire encourages a more connected mathematics curriculum, facilitates cross curricular themes and enables personalised learning. Conference delegates also have the opportunity to participate in hands-on workshops using TI-nspire.

E6 Jan Winter & Laurinda Brown
KS3,KS4,KS5,T,A

The Subordination of Teaching to Learning

■ **DOUBLE SESSION WITH F7**

NCETM has funded a group of 9 people, four of them in their first year of teaching, to explore practically Gattegno's ideas for the teaching of mathematics using the powers of children. Come and experience the use of imagery and other powers led by members of the group. There will be space for you to offer your teaching strategies as we explore the meaning of the title of the session.

E7 Doug French
KS2,KS3,KS4

Mental Calculation: Utility and Understanding

Mental calculation is a vital skill which can greatly enhance understanding of number and number operations, besides being of great practical value in finding both approximate and exact solutions to problems. The session will look at classroom approaches to working mentally on a variety of aspects of number from multiplication tables to dividing fractions and decimals and will make links to written methods of calculation and the use of calculators.

SESSION E - FRIDAY 9.00–10.30AM

E8 Cherri Moseley — F,KS1,KS2

Supporting Mathematics Teaching and Learning with Stories

There are some fabulous children's stories out there that are a gift to mathematics. Explore stories for multiplication, division, shape, geometry, time etc and how you can use them to support teaching and learning in the Foundation Stage, Key Stage 1, Key Stage 2 and Special needs children.

E9 Ton Lecluse — KS5,T,A

Geometry proof with computer help

■ **DOUBLE SESSION WITH F9**

It seems to be difficult to construct your own nice exercises about geometry proofs to be used in class. But it isn't! Just draw a triangle with its circumcircle or incircle, one or more special lines (angle bisector, median, altitude) and ask the computer about hidden secrets in the model. The computer also generates all special information that is needed to build the proof of such a secret. The result: your own design of a new exercise, with proof! Also possible is to search for difficult geometry problems in old school books. Often you have the exercise, but not the proof. Then the software can help you to find important properties of the model, whereafter the proof is more accessible. On my website some nice results are available for everyone. Just google my name. **You will need your laptop for this session.**

E10 Chris Stone — KS2,KS3,KS4

Using IWB to demonstrate pedagogical ideas in Mathematics – Promethean IWB

This session will demonstrate over 30 pre-prepared flipchart pages on how to use the Promethean IWB and voting, in a more pedagogical and interactive way, utilising some of the more powerful aspects of ACTIVstudio 3. Colleagues will also have the opportunity of interacting with the board.

E11 Stuart Naylor — KS2,KS3,A

Active Assessment: thinking, learning and assessment in mathematics

Are you committed to assessment for learning in principle, but unsure of how to do this in practice? Do you understand the theory, but feel that you need more subject-specific examples? This session is about making it happen in your classroom. Active Assessment gets pupils talking, thinking and learning while assessment is going on. Active Assessment uses a wide range of simple but creative approaches that can transform your teaching. Don't miss this.

E12 Joan A. Cotter — KS1,KS2,A

Maths card games join up learning concepts and number facts with enjoying maths

Children need to understand concepts, but they also need opportunities to practice skills. With these maths card games, pupils learn while playing. Games provide motivation for math practice in the same way interesting books provide reading practice. Come and play some addition, multiplication, and fraction games.

E13 Kimie Markarian — KS1,KS2,KS3,T,A

Soroban and Mental Arithmetic in an IT age

■ **DOUBLE SESSION WITH F13**

The soroban is a 'manipulative' tool which caters for all three learning styles. This session will demonstrate how use of the soroban can improve the understanding of numbers, place value and of the way mathematical processes work (i.e. bridging), as well as enhance the memory of the user. Number representation on the soroban means the brain requires much less effort when performing mental arthmetic using soroban images. The positive effects of the soroban both inside and outside the field of mathematics have already received international recognition. The session will be relevant to all age groups and also to special needs groups, like those with dyscalculia.

E14 Kate Mackrell — KS3,KS4,KS5,T,A

Motion and 'Magic' with Cabri 3D

This workshop will introduce participants to creating a variety of different motions using Cabri 3D in order to model physical and mathematical structures and also to create amusing cartoons. Motion will range from direct motion, through motion by transformation, sinusoidal motion and motion generated by Lissajous curves. 'Magic' is the means by which Boolean constructions enable objects to appear, disappear and exhibit different types of motion at different times. Some familiarity with Cabri 3D is desirable. **Participants should bring their own laptops**: demo Cabri 3D software will be provided.

SESSION F - FRIDAY 11.00–12.30PM

F1A Jennifer Piggott
▸ THIS SESSION RUNS FROM 11-11.40AM — All

Rich tasks–Rich activity–Rich outcomes–NRICH activities and developments

At the 2007 conferences, teachers raised the issue of the need for specific suggestions for enrichment challenges closely related to the mathematics curriculum. NRICH has prepared curriculum mapping documents for AS & A level Core Mathematics 1 to 4 with links to both short and extended enrichment challenges. Mappings for the other A level modules are being prepared. They have been trialled by a group of A level teachers and students. Come and find out about them and discuss how they might be more usefully developed.

F1B Anne White & Alan Wigley
Supporting teaching and learning–the Secondary National Strategy Mathematics Framework — KS3,KS4

▸ THIS SESSION RUNS FROM 11.50-12.30PM

A workshop to explore the new resources and approaches being developed to support teachers as they implement the new National Curriculum Programme of Study. The Strategy team have developed a new planning toolkit and resources to help teachers, particularly with respect to the Key Processes in secondary mathematics.

F2 Barbara Ball
Functional Mathematics in the classroom — KS3,KS4,KS5,T,A

■ DOUBLE SESSION WITH E2

How can teachers help learners acquire joined-up thinking about mathematics by developing "the skills and confidence to apply, combine and adapt their mathematical knowledge to new situations in their life and work", as demanded by the Functional Skills Standards? Do you give your students 'Functional Mathematics' problems (i.e. 'real-life' problems which are no longer about real life when brought into the classroom) or do you help them to function mathematically? As a result of Mike Ollerton's seminar at the 2007 ATM conference a new ATM publication offers activities that help learners to function mathematically. In these two sessions you will work on some of these activities. We shall also discuss what teachers can do to encourage learners to function mathematically.

F3A Tony Gardiner
▸ THIS SESSION RUNS FROM 11-11.40AM — KS2,KS3,KS4,General

The first National Mathematics Teachers' Summer School: a report

Last summer witnessed the first *National Mathematics Teachers' Summer School* at which 80 teachers with between 2 and 8 years experience were immersed in mathematics in the delightful surroundings of Robinson College, Cambridge for 6 days. We summarise their goals, look at the kind of things they got up to, and indicate some of the conclusions that emerged from the experience.

F3B John Suffolk
▸ THIS SESSION RUNS FROM 11.50-12.30PM — KS2,KS3,KS4

Pupil power: using pupils to teach mathematics

We will explore ways in which mathematical topics can be explored in a fun way using learners as living teaching aids. In the session, participants will be the teaching aids. The topics come from across the curriculum, at various levels and include area, prime numbers, sequences and series, coordinate geometry and loci. You will create distance time graphs without using either a ruler or a watch.

F4 Carol Knights
Smartboard resources for secondary mathematics teaching — KS3,KS4,A

■ DOUBLE SESSION WITH G7

The Mathematics Association worked closely with SMART to create a range of interactive resources to support secondary mathematics teaching. This session will give teachers the chance to explore a selection of these resources and share ideas for classroom use. **You may wish to bring your own laptop with SMARTNotebook software** which can be downloaded in advance from http://www2.smarttech.com/st/en-US/Support/Downloads/default.htm

F5 David Cain
Mathematical Journeys–Some Departure Points. 36: Rectangular Areas & 63: Garden Path — KS3 upwards

Two deceptively simple area problems lead to some pretty neat formulae and certainly to Pythagoras' Theorem!

F6 Richard Browne
What does it mean for learners to become functional with mathematics? — KS3,KS4,A

The session will consider what can enable learners to use and apply mathematics with confidence. Participants will work in groups to consider a number of questions that have been chosen to promote discussion about what skills are needed in the workplace and in learners' lives. We will then discuss the links between solving problems and being functional, and will consider the extent of problem solving in current tests and examinations.

SESSION F - FRIDAY 11.00–12.30PM

F7 Jan Winter & Laurinda Brown
KS3,KS4,KS5,T,A

The Subordination of Teaching to Learning

■ **DOUBLE SESSION WITH E6**

NCETM has funded a group of 9 people, four of them in their first year of teaching, to explore practically Gattegno's ideas for the teaching of mathematics using the powers of children. Come and experience the use of imagery and other powers led by members of the group. There will be space for you to offer your teaching strategies as we explore the meaning of the title of the session.

F8 Jean-Jacques Dahan
KS3,KS4,KS5,T,A

Analytic geometry with Cabri 3D for all levels

We will show how to use all the features of Cabri 3D in relation with coordinates and equations. It can change completely the way of teaching analytic geometry and also student understanding. We will particularly show the importance of creating points given by their coordinates and of modifying these coordinates and see the link between intersection of planes and system of equations. We will use *dot product* and *cross product* to illustrate a lot of ideas, impossible to illustrate with paper and pencil.

F9 Ton Lecluse
KS5,T,A

Geometry proof with computer help

■ **DOUBLE SESSION WITH E9**

Often you have the exercise, but not the proof. Then the software can help you to find important properties of the model, whereafter the proof is more accessible. On my website some nice results are available for everyone. Just google my name. **You will need your laptop for this session.**

See E9 for detailed listing . . .

F10A Colin McCarty
KS1,KS2,A

Understanding good test design

▸ **THIS SESSION RUNS FROM 11-11.40AM**

A discussion workshop - exploring good test design practice including the algorithms used to obtain levels from well designed tests. Obtaining diagnostic information from testing leading to AfL. From 1992 to 2000 Colin was director of KS3 science test development, the initial director of KS2 test development for QCA and researcher of KS2/3 mathematics assessment for ACCAC.

F11 Adrian Oldknow & Ron Taylor
KS3,KS4,KS5,T

Teachers working collaboratively with ICT in mathematics, science and technology

Supported by the Partners in Learning Programme of Microsoft and the Teacher Development Agency, a group of five secondary schools from Hampshire are working together on developing collaborative and integrated approaches to teaching maths, science, technology and allied subjects with ICT as a catalyst. We will report on the schools' experiences in developing the collaborative practice model used, and illustrate activities, and accompanying resources. Examples of current activities include: video analysis of pupil's physical activities in the gym and sports field, data-logging using hand-held technology and sensors & designing 3D models.

F12 Mark Thornber
KS4,KS5

Enrichment at KS4 and KS5

In this session I'll look at a number of activities that can be done with a higher tier GCSE class or a year 12 class, assuming no more knowledge than the standard curriculum. Most will be graphical and I tend to use a TI 83 calculator when appropriate, although this is not intended as a workshop session.

F13 Kimie Markarian
KS1,KS2,KS3,T,A

Soroban and Mental Arithmetic in an IT age

■ **DOUBLE SESSION WITH E13**

The Soroban is a 'manipulative' tool for all three learning styles. I demonstrate how it can improve the understanding of numbers, place value and of the way mathematical processes work (i.e. bridging); and enhance the memory of the user. Number representation with less effort when performing mental arthmetic using Soroban images. Its positive effects, both inside and outside the field of mathematics, have already received international recognition. Relevant to all ages and to special needs groups, especially dyscalculia.

F14 Donald Keedwell
General

Sudoku latin squares: applications and problems

Historically, Sudoku latin squares have been used or proposed for economic storage and recall of arrays (e.g. pictures) and for the design of experiments. It has been shown recently that the "usual" method of constructing orthogonal latin squares also, surprisingly, constructs maximal sets of orthogonal Sudoku squares. We shall also discuss minimum Sudoku puzzles.

SESSION F - FRIDAY 11.00–12.30PM

G1 Tony Robin — General

Some interesting problems . . .

Problems included will be: What is the chance of a permutation of *n* objects containing a cycle of length *r*? How many times does a coin need to be thrown in order to get *k* more heads than tails – links with Catalan numbers? Will not need knowledge of these. I have had a session with a similar title before, but I shall not look at the same problems.

G2 Douglas Butler — KS3,KS4,KS5,T,A

The TSM 07/08 CD – resources for all occasions

The widely acclaimed CD from the TSM Workshops will be handed out. This latest edition is packed with files and ideas from the summer residential workshop at Oundle School, provided by the tutors and the delegates. Files for Autograph 3, Cabri 2, Cabri 3D, GSP 4 and Excel. Also included is the complete Waldo Maths java site, ideas for making the new Word 2007 mathematically friendly, and a wealth of amazing web links from: www.tsm-resources.com

G3 Nadia Baker — KS2,KS3,KS4,KS5

Mathematics joined up with the real world through codes and codebreaking.

The Enigma Project is an outreach project of the Millennium Mathematics Project at the University of Cambridge that uses hands-on codebreaking to engage KS2-5 students with mathematics. This session aims to show how the science and history of cryptography can be used in the classroom as a context for the development of data handling, problem solving and logical reasoning skills. It will include a demonstration of a genuine WWII Enigma machine, explaining how mathematicians have changed the course of history through cracking secret codes. Delegates will have the opportunity to put their code breaking skills to the test, and gain definitive verification that mathematicians can be heroes too!

G4 John Silvester — KS4,KS5,T,A

Many cheerful facts about the square of the hypotenuse

I shall use Geometer's Sketchpad to give some entertaining and highly visual (but not new) proofs of Pythagoras' theorem and related results, together with extensions and applications; there may also be a little number theory, on sums of squares. There will be plenty of material here for pupil investigations.

G5 Sue de Pomerai — KS5,T

Teaching Decision Mathematics

Why study Decision Maths? How does it relate to other areas of A level Maths. What is it useful for? What's the best way to approach it with students? This session is for teachers who have just started teaching it or may be thinking of doing so in the future. It is not specific to any exam specification but will aim to give some context to this area of mathematics and some ideas for practical activities that can be used with students.

G6 Peter Hall — KS1,KS2,A

Using calculators effectively in the Primary School

The new revised framework has clearer guidance on using the calculator in primary schools. However there is still a lot of confusion about using calculators. This workshop will give pratical activities that can be used across the primary age range. It will aim to show how using a calculator can help children learn mathematics.

G7 Carol Knights — KS3,KS4,A

Smartboard resources for secondary mathematics teaching

■ **DOUBLE SESSION WITH F4**

The Mathematics Association worked closely with SMART to create a range of interactive resources to support secondary mathematics teaching. This session will give teachers the chance to explore a selection of these resources and share ideas for classroom use. **You may wish to bring your own laptop with SMARTNotebook software** which can be downloaded in advance from http://www2.smarttech.com/st/en-US/Support/Downloads/default.htm

SESSION G - FRIDAY 11.00–12.30PM

G8 Joe Watson — KS3,KS5,T,A

Exploring numbers with a hand-held calculator

A workshop session exploring the use of a simple hand-held calculator + – × ÷ √ (**please bring your own**) in investigating patterns, limits, large and small numbers, estimation and 1-sig fig arithmetic, and leading to ideas of conjecture, exploration, justification and proof.

G9 David Acheson — General

Whatever Happened to A, B and C?

Not so very long ago, elementary mathematics featured three men, usually called A, B and C, who filled cisterns and ploughed fields in a dedicated and uncomplaining way that would, today, be an example to us all. I intend to go in search of A, B and C, and to demonstrate how such highly-contrived 'problems' from the past can, on occasion, show mathematics at its very best.

G10 Jennie Pennant — KS1,KS2

How is it for you? A look at capturing children's impressions of their learning and mathematics on video

This workshop will look at 'joining-up' children and teacher views of learning and mathematics in the classroom by using a video camera for interviews. Several video clips of interviews with children will be shown and the 'surprises' to the teachers discussed. The practical strategies of organising the interviews and encouraging the children to talk will be discussed. Finally the use of such videos in teacher CPD and school self evaluation will be considered.

G11 David Crawford — KS2,KS3,KS4

It's a kind of Magic

In this session I will demonstrate some tricks, all based on mathematical principles, which can be used in the classroom with pupils of all ages both as an aid for practising number work and as a source of problems for algebraic manipulation and proof. However the main thing about these tricks is that doing them is fun so come and join in—**pen & paper essential—a calculator may be useful**!

G12 Marianne Freiberger & Marc West — KS4,KS5,T,A

Careers with mathematics

Development aid, architecture, medicine, music, space flight – mathematicians work in almost any area you can think of. The wide range of career options for mathematicians is unfortunately one of the best-kept secrets of the field, leading some students to favour other subjects when it comes to choosing A and A/S levels or degree courses. This session will explore the *Plus* (http://plus.maths.org) magazine careers library which contains over 40 interviews with working mathematicians. We'll look at some examples in detail, focusing on the mathematics behind them, and highlight the core skills that make mathematics so versatile a subject.

G13 Doug Williams — KS2,KS3,KS4,T,A

4 & 20 Blackbirds

One session - one problem? Yes, and by the end you might be wishing you had more time. As you work like a mathematician to explore its depths you will have opportunity to reflect on the teaching craft which has engaged so many students (and teachers) in it. The workshop is intended to provide time for you to have some personal fun with mathematics, but also to encourage you to consider the possibilities of a curriculum which has investigation and higher order thinking at its core, rather than skill practice and recipe responses.

G14 Tung Ken Lam — KS2,KS3,KS4,KS5,A

Mathematics and Origami

Paper folding provides an accessible context for mathematics that engages learners. It gives learners the opportunities to join up mathematical topics. You will fold individual pieces of paper and join them up without cutting or glue. With this style of origami (modular origami) you can make polyhedra, explore variations, make designs that change shape, and much more!

SESSION H - SATURDAY 9.00–10.30AM

H1 Maria Veronica P. Quilinguin
KS1,KS2,KS3,KS4,KS5,T,A

Addressing Common Errors in Mathematics Through Joined-up Measures

Common errors that students bring with them from Primary all the way up to Tertiary Mathematics will be discussed. In the course of the session, the roots of the mistakes will be considered. A productive discussion on what and how joined-up measures can help in correcting the common errors is hoped to be achieved.

H2 Doug French
KS3,KS4

The Creative Use of Odd Moments

My feature under this heading has appeared in Mathematics in School for many years and two collections of Odd Moments from past issues are now available as Mathematical Association publications. This session will look at ways in which some of these Odd Moments, which involve a wide range of ideas at different levels, can be used creatively in the secondary school classroom.

H3 Wendy Brady
KS2,KS3,KS4

How to consolidate Key Ideas without drill and practice

We will begin by identifying 'Key Ideas' that spread across mathematics (like place value, proportionality) without which the pyramid of learning collapses. We will then look at the consolidation of those skills so that they do not become the weakness that prevents understanding of other ideas. Looking at what has worked with one school and then extending the idea and looking at a collection of resources to be called CIBOR

H4 Joyce Brown
KS2,KS3,KS4

'Ringing the Changes'- The Mathematics of Bellringing

This session takes a look at the mathematics of change ringing, with the opportunity to have a go with a set of hand bells. With 4 different bells, there are 24 different 'changes' that can be rung, but there are particular rules about the order of ringing these, which lead to symmetry, Fibonacci numbers, Pascal's triangle and networks. Group theory is involved, but this talk will not be at that level; the mathematics is accessible to all, and has been given to both primary and secondary masterclasses.

H5 Chris Stone
KS2,KS3,KS4

Demonstrating a Year 6 KS2 lesson on Understanding angles – Promethean IWB

This session will demonstrate how a year 6 KS2 lesson on Understanding angles was taught using a pre-prepared set of flipchart pages using the Promethean IWB and voting, in a more pedagogical and interactive way, utilising some of the more powerful aspects of ACTIVprimary 3. It will also include interactive aspects where colleagues can come to the board and interact.

H6 Bob Burn
KS4,KS5,T,A

Joining Euclid and Archimedes

Euclid found the volume of a pyramid. Archimedes, while investigating areas, found the sum of consecutive squares. We will look at their methods, extend them a bit, and use Archimedes' methods to solve Euclid's problem: all without calculus.

H7 Sidney Tyrrell
KS1,KS2,KS3,KS4,KS5,T,A

Excel 2007 is here!

No it's not a mere tweak it's a big rewrite – this is Excel as never before. Ribbons and reasons, contexts not confusion. Explore new features, and old familiars in new guises. Ten tips for transferring your old skills to the new, not forgetting PivotTables and filters.

H8 Liz Russell
KS2,KS3

Transition bridging the gap

Over the last 5 years I have been going into our feeder primary schools with 6th formers to run different workshops for year 6 pupils. This is a practical workshop with ideas and suggestions as to how secondary schools can link with their Primaries.

SESSION H - SATURDAY 9.00–10.30AM

H9 Elaine Walcot — KS2,KS3,KS4

Strung Out

A selection of activities and ideas for both Primary and Secondary pupils which I have used as part of my school's Maths Specialist outreach programme...mostly involving string! There will be some colouring-in too for those who need a few Zen moments, and maybe a frog or two...

H10 Jayne Stansfield — KS3,KS4,KS5,T,A

Dancing in groups

On the Mathematics Enhancement Course at Bath Spa University our main aim is that the students leave us to start their ITT course with understanding of the joined up nature of mathematics, both between different aspects of mathematics and to the real world . This session is an example drawn from the course which explores the patterns in country dancing and the underlying mathematics. By the end of the session you will be dancing with mathematics!

H11 Snezana Lawrence — KS3

History of Mathematics in the Mathematics Classroom

This session will provide the basic concepts behind the use of the history of mathematics in the mathematics classroom. It will look at the principles of providing an ontological context of mathematical development and how this can enhance understanding at KS3. It will also offer some practical means and worksheets to teachers who wish to explore a similar approach to teaching this subject.

H12 NCETM — KS5,T,FE

Improving learning in mathematics: what do subject learning coaches do?

The NCETM leads the mathematics subject coaching networks for the QIA National Teaching and Learning Change Programme. In this session you will have the opportunity to try out some of the activities and approaches used by teachers in the networks, and to update on future activity.

H13 Jill Mansergh — KS1,KS2,A

It makes you think

In this session you will have the opportunity to work with some of the resources and activities in the ATM publication *It Makes You Think*. See how the Sudoku can be introduced in the foundation stage. Engage in some shaping-up activities and participate in some collaborative problem solving.