

Introduction

Dr

This report seeks to identify activities/events of M.A. and its branches, that are happening in the academic year September 2009-July 2010 and are aimed at 'youths' or school children directly, as opposed to (say) teachers of such children. The report is based mostly on returns made by branch officers either on the M.A. web site or directly to the author via Branches Committee meetings. Hence the following may not be complete or exhaustive. Specific branch names are included merely to enable those readers considering whether or not to undertake similar events within their branch area to look at the specific Branch web site and seek further advice on the logistics of running such an event via the contact name(s) supplied there. The events are recorded under event-type headings and not by branch. Details per branch can generally be found under the branches link on the web site.

1. Lectures/talks/activities on aspects of Maths & Statistics

Most branches organise talks on different aspects of mathematics or statistics that are aimed to appeal to schoolchildren. These events are often free to all members, often held in an evening or perhaps on a Saturday, and typically are an hour in length – or sometimes longer if the audience is encouraged to actively participate. The frequency of such events, the location and their timing during the year depend on the branch concerned.

From a Youth Activities perspective, these talks aim to popularise mathematics (and mathematicians) and encourage more students to study mathematics throughout their school days and beyond, just as national lecture series such as the Holgate Lectures do. The mathematical topics covered may be directly linked to the school mathematics curriculum or more 'fun maths'. School 'parties' to these events are encouraged, but teachers should check the details of any talk to see if a specific student age range or level is most suitable. For example, some talks are particularly signposted as 'sixth-form lecture', etc. Some advertised talks may not be suitable for schoolchildren but rather aimed at teachers and teaching methods.

Branches wishing to attract speakers might try contacting speakers known to have given such talks at branch meetings in the past, and perhaps check websites such as <http://www.mathsinspiration.com/speakers.html>. It should be noted that some speakers ask for a fee and that some popular talks may need to have admission by ticket only and/or charge a small entrance fee to cover costs.

Examples of talks organised by M.A. branches and suitable for school children, for 2009-10 include:

Tuesday 26 January 2010; Cheltenham College (7.30pm). Dr David Acheson (Jesus College, Oxford); *title to be confirmed*. Suitable for sixth-formers. Organised by the Gloucestershire Branch.

Thursday 25 February 2010; 5pm; The University of Liverpool, Mathematical Sciences Building.

Richard Lissaman, (University of Warwick) :

From Google to Tomb Raider: The mathematics of internet search engines and video games. This talk is suitable for sixth forms and perhaps some Year 11 students. See the Liverpool Branch page for further details.

Saturday 13 March 2010; 1.30pm for 2.00pm.

Tom Roper; School of Education, University of Leeds Study Session: "Taxi-cab Geometry". This is a hands-on session organised by the Yorkshire Branch.

March 2010; University of Leeds.

W P Milne Lecture for Sixth Formers

Dr Chris Sangwin (University of Birmingham); title to be confirmed. See the Yorkshire Branch web page for further details.

2. Maths Quizzes/Challenges.

Many branches now organise and run competitions such as maths quizzes and maths challenges for schoolchildren of various age groups. These branch events often complement UK national challenges in that they attempt to cater for wider age ranges and mathematical abilities. These events may be single-day events at a local venue or paper/web-based maths problems that are set for students to tackle at home and submit answers for marking. Prizes of some form are usually on offer.

The style of the quizzes/challenges often involves 'fun-maths' problems of logic rather than repeating GCSE and/or A-level type questions. Similarly, delivery styles using 'ask the audience' electronics etc. are often used rather than a formal examination room style.

In many cases, these quizzes/challenges take a little time to 'bed in' and for numbers attending to grow. However, those branches running pop-maths quizzes (see below) have reported increasing youth participation over the years and they remain popular branch events. They can be demanding in terms of organisation requirements and sponsorship from commercial organisations may be helpful when offering prizes.

Examples of quizzes and challenges organised by M.A. branches and suitable for school children, for 2009-10 include:

Saturday 13 March 2010, 'pop-maths' Quiz. Sheffield Hallam University.

The oldest and most established of such quizzes, this quiz "runs along the lines of a pub quiz but without the alcohol!" and each quiz has 20 questions. It caters for four distinct age groups starting from Year 6 and runs on a Saturday morning. Prizes are awarded at the end.

Youth Activities, Academic Year 2009-10

The day also includes two popular maths lectures in the afternoon so that the event is a full day out.

Bookings for the event can be made on-line via the quiz's own web site at <http://popmaths.com/> and also further enquiries can be made via the Yorkshire Branch contacts. (Note that Leeds University hold a pop-maths Quiz on the same day)

Saturday 6 March 2010, 'pop-maths' Quiz. Liverpool John Moores University.

Running for the last 7 years, the Liverpool Branch have run a similar event to the Sheffield quiz but targeted only at 16-19 year olds. The style of questions is similar to the Sheffield quiz but students are organised in school teams of five and are able to input their answers into 'ask the audience' hardware which 'marks as they go' and promotes the pub-quiz style.

The Liverpool Branch fully recognises the help offered by the Sheffield Branch in starting up this quiz. It is now sponsored by Barclays Bank PLC and other organisations to allow prize money totalling £1000. Student participants have increased in number from 30 in the early years to 150+ in each of the last two years.

For more details and entry form, contact the Liverpool Branch contacts directly.

Open Challenge

The Liverpool Branch has run a version of the more traditional maths challenge event for a number of years. There is both a 'singles' and 'team' competition for pupils under the age of 18 years, and in 2009-10 this is offered during school half-term week in February. Cash prizes and certificates are on offer.

For more details and a look at previous years' question papers, see the Liverpool Maths Society pages at www.maths.liv.ac.uk.

Organisers of this event have reported that student numbers participating fluctuate over the years as students attempt other national challenges as well. However, the Challenge maintains links between the M.A. locally and local schools and colleges and receives a high standard of response. More details can again be found at the Liverpool Maths Society web page.

Primary Maths Challenge (PMC)

The M.A. runs a national challenge, called the Primary Maths Challenge, in November of each year. The PMC is a test with multiple-choice problems which interest pupils and are mathematical. It is aimed at the top 60% of pupils in Years 5 and 6 England and Wales, P6 and P7 in Scotland, and Years 6 and 7 in Northern Ireland. High-scoring pupils are invited to take the PMC Finals in February.

In November 2009, more than 94,000 pupils took the Challenge, teachers in more than 2500 schools entered pupils for the challenge and the M.A. posted nearly 69,000 certificates for presentation in assemblies. The M.A. aims to make November 2010 an even bigger success.

Further details and copies of previous years' test questions are available by following the PMC link from the M.A. Home page.

3. Master-classes

These are mathematical activities, often under the 'gifted-and-talented' banner. Saturday mornings are the most popular times for these classes and they are often located at a local University.

In Liverpool for example, the Mathematical Society's sister organisation Mathematics Education on Merseyside (MEM) runs 5 master-classes during the year for selected year 8, 9 students in Merseyside. They also run Challenge Quizzes aimed at years 7, 8, 9, and 10 and a Merseyside Numeracy Challenge for years 10, 11. (For more details, see web-site <http://www.liv.ac.uk/math/MEM/>)

4. M.A. Branch activities in Schools

The above youth activities concentrate mainly on branch events that are outside students' normal school activity. The Funmaths Roadshow is built on an attempt by the Liverpool Branch to offer maths activities for students in their school during normal school hours.

The FunMaths Roadshow is a collection of over 350 mathematical activities suitable for use with school pupils, college students, and university undergraduates, overall between the ages of 10 and 20. The first set of nearly 100 was developed to celebrate the centenary of the Liverpool Mathematical Society in 1999, and the further set of nearly 300 has been developed subsequently.

Led by members of the Liverpool Mathematical Society, the development of the Roadshow is an ongoing attempt, in part, to provide a brief experience of some elements of what practising mathematicians do in real-life. All this takes place in a non-confrontational and non-competitive setting encompassing both challenge and enjoyment.

The FunMaths Roadshow currently consists of fourteen 'boxes' covering ages from 6 to 18 years. Each box contains 25 mathematical activities displayed on coloured laminated A3 baseboards, with associated equipment in zip wallets. For most groups of participants just two of the boxes are used. The activities are set out on tables in a hall or large space, chairs not being used as they can hinder movement or act as a trip hazard. All that a participant needs is a pen or pencil.

Participants move around the room tackling the activities in any order they choose. Each participant has a customised response sheet to be stamped or initialled by a helper when each activity is successfully completed. Helpers in a school-setting could be staff or older pupils from the school or, in a primary school, perhaps even pupils from a secondary into which the primary school feeds. In a typical session of 50 - 75 minutes, with pupils working in pairs, most pupils will complete a dozen or so activities.

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The number of schools having a Roadshow visit has increased significantly over the years and these schools now cover most regions in the country. There is a running and development cost associated with this project and the Society is particularly grateful for the support of various organisations during the Roadshow's development, including COPUS and EPSRC under the Partnerships for Public Awareness Scheme. It also has a dedicated band of organisers able to visit these school locations.

For further details, see the Liverpool Maths Society homepage and follow the FunMaths Roadshow link in the Introduction on that page.

5. Mathematical networking

The youth activities listed above involve young mathematicians meeting at some venue away from their home. Yet mathematicians of all ages are able to enjoy mathematics at home with the help perhaps of good mathematical literature and a computer that has internet access. This latter facility enables communication with other young mathematicians via chat-rooms, on-line maths forums, etc.

The M.A. encourages this activity via the **Society of Young Mathematicians (SYMS)**. SYMS is for all young people who enjoy mathematics, whether they are in a junior or secondary school. Members are part of a national organisation which motivates and encourages young mathematicians. Full yearly membership is open to all young mathematicians for typically less than £10 per year. Every term members receive the SYMS Newsletter – Symmetry Plus, which contains short articles, news, things to do, calculator hints, book reviews, games, puzzles and competitions. Members also receive termly copies of the journal Mathematical Pie which contains interesting maths problems, puzzles and articles. Also available to SYMS members are discussion boards on the SYMS website. Members can discuss the fortnightly problems posted on the SYMS website and join in forum discussions on other matters related to mathematics. For more details, follow the SYMS link from the MA Home page.



Above: Members assembling for the session in memory of Doug French.

Summary

As the above tries to show, the M.A. and its branches network continues to successfully offer a wide range of mathematical activities for 5-19 year olds. Branches continue to offer the more traditional mathematical lecture/talk on popular applications of mathematics. The delivery of quizzes, challenges, master-classes etc. would appear to be increasingly popular with students. Branches moving to offer such quizzes and challenges may need to coordinate their efforts with national quizzes and challenges to ensure support from local schools for all such events.

The 16-19 age range seems well catered for by branch activities. The roadshow idea of taking maths activities directly into junior and secondary schools is extremely successful. In the primary/junior sector, branches could usefully promote the Primary Maths Challenge more when in contact with local schools. The future challenge for branches with regard to youth activities may well be related to the use made by young students of communication technology. Attendances at lectures may well decline gradually as more youngsters expect instant 'bells-and-whistles' on-line. Again, branches might need to consider a place for the promotion of membership to (say) SYMS and 'on-line branch events' running alongside more traditional activities.

Dave Pountney, Youth Activities officer



Above: Conference delegates at two sessions