

Research Update

June 2012

Mathematics Education Centre · Loughborough University

www.lboro.ac.uk/mec

Welcome

It's been a busy time here in the Mathematics Education Centre at Loughborough University since the first issue of "Research Update" back in January. In this issue we give an overview of some of the activities that have been going on this year so far.

Research Update is a newsletter sent out three times a year to schools in the East Midlands and beyond. It is for teachers and leaders wanting to keep abreast of upcoming and recent maths education research in the region. In each issue we share a little about who we are and what we do in the Mathematics Education Centre. For further details on anything you read or to join our schools email list please contact us at the address below.

We hope you find this newsletter useful and we welcome feedback and suggestions.

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Upcoming Research

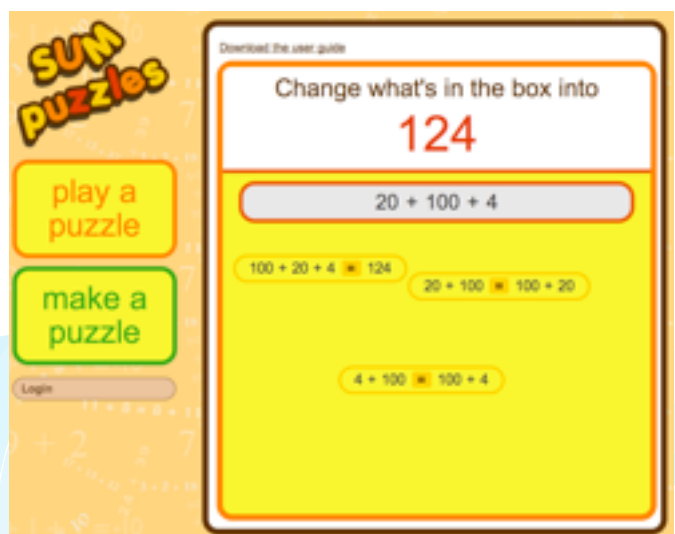
Here at Loughborough we're often seeking teachers and students interested in participating in upcoming research studies. Engaging with research can aid professional learning and some activities can be conducted as free CPD events at your school. If interested please contact Ian at the above address.

A Decisive Issue. What do teachers consider when they make their classroom decisions? We recently found that decisions are based not only on their content knowledge but also on pedagogical, curricular, professional and personal considerations that characterise their practices (see below). To investigate this further we're looking for GCSE maths teachers to discuss some teaching scenarios with us. All discussions will be treated with strict confidence and all data will be anonymised. For more information please contact Irene Biza at i.biza@lboro.ac.uk

Step Up to the Marks. We are looking for a secondary maths teacher to mark 250 specially designed GCSE-style exam scripts. We will pay

£18.55ph and you'll get to see how students from other schools coped with very functional problem solving questions. We'd like the marking completed by the end of July. Contact Ian at the above address if interested.

Sum Puzzles. www.sumpuzzles.org We have recently developed a free-to-use website, called *Sum Puzzles*, to support children in the shift from arithmetic to algebra at Key Stage 2 and 3 (see below). The support booklet for the website is included with this newsletter and contains user guides and lesson plans. If you'd like to try the website with your classes we'd be very keen to get some feedback on how it went and what you thought of it. For more information contact Ian at the above address.



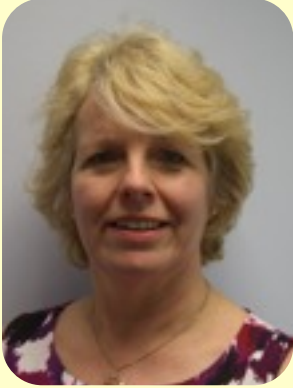
Recent Research

In this section you can find a round up of recent research studies that we think are of particular interest and relevance to practising teachers. There are many other maths education research studies being carried out at Loughborough as you can see at mec.lboro.ac.uk For further information about any of our research please contact Ian at the above address.

Paths to Maths. The Pathways Project involved the Mathematics Education Centre here at Loughborough University and Year 11 classes in four schools, and was supported by the NCETM.

The idea was to enthuse high achieving Year 11 students about mathematics and encourage their further study of mathematics in Years 12 and 13.

The Further Mathematics Support Programme



The FMSP is managed by Mathematics in Education and Industry and funded by the Department for Education. In the East Midlands we have bases at both the University of Nottingham and the Mathematics Education Centre here at Loughborough University. The FMSP encourages schools and colleges to deliver Further Mathematics, either

themselves or in collaboration with other local schools and colleges. In addition to this it is my remit to encourage students to pursue mathematics beyond 16, and to inform them of its value at university and in their everyday lives.

Involvement starts at or before students reach Year 8 by providing varied mathematics enrichment at venues such as Snibston Discovery Park and the National Space Centre, where we have delivered events including "Maths in the Environment" and "Maths in Sport and in Space". We aim to encourage students to engage with mathematics and view it as a satisfying and rewarding subject choice for Year 11.

Our numerous events this year have been well attended and great fun. Our main event at the end of the spring term was the Rollercoaster. 165 Year 10 students enjoyed an amazing day during which Dr John Roberts told us about his involvement with The Big One in Blackpool, the London Eye, and stunts for Top Gear. Students also visited a number of attractive and varied activities on offer.

In addition over 300 students have benefited from our A level revision classes. It is not only students we aim to please! There are a range of CPD events throughout the year for teachers to take advantage of, including help with new resources being made available for functional maths.

If you would like information about any of our events please get in touch with me at

n.a.timson@lboro.ac.uk

Nicki Timson

Further Mathematics Support Programme Area Coordinator

Each school followed a different pathway in terms of curriculum and examinations; for example:

- Entry for GCSE mathematics at the end of Year 10 followed by A/S Mathematics in Year 11.
- Entry for GCSE mathematics at the end of Y11; no additional qualification offered, but with the course enhanced by practical work and ICT.

The four teachers who were involved worked with MEC staff, attending nine workshops at the university over one year. Outcomes from the project were variable across the schools. Teachers expressed growth of understanding and confidence in new approaches to classroom activity. Surveys of students revealed a higher level of confidence and enjoyment compared to results from a control school. Three of the schools decided to continue the pathway in future years.

If you would like to read more about this project and its outcomes, please look at our report to the NCETM on <https://www.ncetm.org.uk/enquiry/6345> (NCETM log in required) or contact Barbara at b.jaworski@lboro.ac.uk

Equality in the Maths Classroom. Many children struggle when they first meet school algebra. One reason for this is the changing meaning of the equals sign as students move from arithmetic to algebra. We developed a website, called *Sum Puzzles*, designed to help students with this change. We tested the website with two Year 7 classes in the East Midlands and found the children talked about and worked with arithmetic in "algebraic" ways. We also measured their understanding of mathematical equivalence before and after the website-based lessons. The children more readily viewed arithmetic equations in terms of reversible equivalence relations after the intervention than they did before.

Decisions, Decisions... What are maths teachers' considerations when they make decisions in the secondary classroom? We invited teachers to give written responses and then participate in interviews based on tasks that are: (i) hypothetical, (ii) grounded on seminal mathematics learning and teaching issues, and (iii) likely to occur in practice. So far, we have identified a variety of maths teachers' priorities and considerations: pedagogical, curricular, professional and personal. We would like your help to expand this study with more tasks derived from real practice and increase our insight on the factors that influence teachers' classroom decision making (see above).