

**AMA day hosted by Mathematics Education at
The University of Auckland**

21 March 2009

Key note

9 am

Bill Barton, Head of the Department of Mathematics at the University of Auckland.

Taking Students into the Fourth Dimension

The disappearance of matrices from the secondary curriculum always struck me as a lost opportunity to excite a large group of students with one of the wonders of modern mathematics. Matrices have enormous power and width of applications, and yet they are very accessible to all levels of secondary students. I will remind you of what you learned, perhaps a while ago, and how you can use them in your class.

At the end of the talk I will outline the variety of paths that your students can take into Mathematics at the University of Auckland.

Presentations

10.00 till 11.00

Anne Blundell

Waiheke High School. Masters graduate in the Faculty of Science at the University of Auckland.

Journey through a Masters in Mathematics Education

In 2008 I was given a study award to complete my 4 year Masters in Mathematics. Since 2005 I had studied part-time at the MEU (Mathematics Education Unit) looking at Mathematics Education from a broad perspective and focusing on what is known about how we learn mathematics.

Along the way I was drawn into various "projects". I will discuss this journey, some of the projects and some "highlights" of my finding from my thesis in statistics education. The last 4 years have been the highlight of my teaching career and I would strongly recommend getting in touch with the MEU if you are interested in furthering your mathematical education knowledge.

Moira Statham

Mathematics Education Unit in the Department of Mathematics.

**Are you a Fire Pig or a Metal Ox?
Mythology and Numerology of Chinese New Year**

This workshop investigates the cyclical nature of Chinese New Year celebrations. Links to horoscopes and personality traits provide an entertaining basis for some mathematical thinking. Participants will take part in this introductory collaborative exercise that engages students and that illustrates the existence of mathematics in unexpected contexts

Mala Nataraj - Selwyn College and University of Auckland
Doctoral student in the Faculty of Science at the University of Auckland.

Tasks that promote deep conceptual understanding

Come along and experience a range of tasks that are mathematically rich and that enhance students' critical and creative thinking skills! Activities include a) operations on integers and algebraic manipulations with the use of coloured tiles b) ideas from history that are useful in the teaching/ learning of number and algebra. These are ideas that I developed while working on my research and that you can use straightaway in the classroom.

Sepideh Stewart
Mathematics Education Unit in the Department of Mathematics

Embodied, symbolic and formal thinking in mathematics

I'll talk for about half an hour about what happens when the student is confronted with the world of matrices at university: their understanding/lack of understanding of linear algebra, how we teach at university, the abstraction they need to deal with etc. I will then focus on vectors and linear combinations to see how we can teach the concepts using embodied and symbolic ideas and finally, how to take students to the formal world needed at university level.

Brian Storey
School of Mathematics, Science and Technology, Faculty of Education, The University of Auckland.

Students Misunderstandings of whole numbers and simple Decimal Fractions

The recent results of a diagnostic assessment of Year 9 and primary teacher trainees indicate difficulties with whole number and simple decimal fractions. These will be examined and a series of activities to rebuild the concepts will be worked through. Participants will be actively involved and take away some useful resources. The themes explored in this workshop will continue in Peter Hughes'.

Tea 11 - 11.30

Presentations

11.30 till 12.30

Hannah Bartholomew

Mathematics Education Unit in the Department of Mathematics

Concept cartoons in mathematics

This session will be run as a workshop, and will explore ways of helping students to develop more conceptual understandings of mathematics. "Concept cartoons" will be introduced as one (non-threatening) way of helping students to recognise their own misconceptions, and of developing a classroom culture in which students can begin to take greater responsibility for their own learning.

We will then work together to create some concept cartoons that can be used with Y13 calculus classes.

Garry Nathan

Mathematics Education Unit in the Department of Mathematics

Non-routine Calculus Questions: Examples from a 1st year University Mathematics Course.

This workshop will consider a range of non-routine calculus questions I have used in my university mathematics classes. Although many students had the necessary skills to work with them, they still found them challenging. Some questions required students to interpret their results, or explain a particular choice. Some of these will also be presented. You will have the opportunity to work with some of them, and discuss their usefulness. In particular, I would be really interested in your thoughts about the use of such questions in a senior school mathematics course.

Sepideh Stewart and Bill Barton

Mathematics Education Unit in the Department of Mathematics

Establishing two-way communication with large classes at university

The talk will start with a brief history of the use of Student Response Systems (also known as "clickers") in university classrooms. We will illustrate this with examples from our experience with Maths 208 students. Participants will get an opportunity to use the devices to respond to questions. We will be very interested in receiving participant feedback.

Peter Hughes

School of Mathematics, Science and Technology, Faculty of Education, The University of Auckland.

Students Misunderstandings of harder decimal fractions

Data showing misunderstandings of Place Value (decimal fractions) will be

presented. The source is year nine students at an Auckland secondary school and tests administered to first year primary teacher trainees. Then practical activities to assist the teaching of place-value (decimal fractions) will be work-shopped.

This continues the theme from Brian Storey's workshop.