

MANSW CONFERENCE 2005

PRESENTATION SYNOPSES ARRANGED ALPHABETICALLY BY PRESENTER

Karoline Afamasaga-Fuata'i

University of New England

Secondary 7-12 & Post-secondary

Vee Diagrams and concept maps as Communication and Assessment Tools

Negotiating meaning and communicating ideas whilst problem-solving collaboratively with peers may be efficiently and effectively accomplished through co-construction of vee diagrams and concept maps (maps/diagrams). Vee diagrams are heuristics that require a conceptual analysis of the problem to identify relevant mathematical principles and concepts underpinning it in order to trouble shoot for potential methods. Completed Vee diagrams display both the conceptual and methodological information relevant to the problem. A hierarchical concept map may be constructed using the conceptual information to illustrate interconnections between main ideas underpinning methods. Examples of student teachers' maps/diagrams of problems and activities will be presented.

Karen Ahearn

Abbotsleigh

Georgina Havadjia

Abbotsleigh

Primary K-6

Enhancing Working Mathematically Processes Through Problem Solving

Working Mathematically through problematic situations enables students to demonstrate their current level of mathematical process without the restriction of more formalised instruction. This workshop will outline different approaches to enhance early strategy development through sequentially based activities. Participants will be provided with examples of activities that encourage students to communicate mathematically both verbally and visually. By providing a plethora of learning experiences, individual learning styles are addressed. Student work samples will be explored in relation to working mathematically outcomes.

Karen Ahearn

Abbotsleigh

Donna Moffat

Abbotsleigh

Primary 3-6 & Secondary 7-10

Why Investigate?

It is the learner's perception of relevance that encourages them to make appropriate links between real experiences and mathematical understanding and purpose. For the past few years students have undertaken mathematical investigation as a component of the class program to promote the utilisation of Mathematics as an investigative tool as well as a research entity in itself. This workshop looks at the impact of individual project based research undertaken by primary students and discusses how students see this affecting the value they place on mathematics learning. Investigations completed by students will be presented as case studies during this workshop.

Karen Ahearn

Abbotsleigh

Sylvia Roberstosn

Abbotsleigh

Primary K-6

Investigation / Visualisation :is it Maths

When providing students with an investigation opportunity do we as teachers, utilise student's visual impressions to support reflection on learning experiences? Is it necessary to encourage students to look towards their own understanding in order to clearly communicate and accommodate further understanding?

This presentation looks at a program of integration with HSIE that provided links with mathematics learning outcomes in an attempt to create meaning for students. Specifically, the presentation will focus on a program of investigation undertaken in a Year 4 classroom that used mathematical skills as a tool to generate meaning in HSIE.

Tony Allan Red-Back Spider Publishing (ACT)

Primary K-6 & Secondary 7-12

Using Arithmetika - Assessment Management Software

Arithmetika is used across Australia to create worksheets, skills tests and multiple choice items - for printing or to be used on-line. Choose from thousands of templates and add your own questions. All content is fully customisable. Solutions are calculated for you and on-line items marked for you. The session will be presented by the developer of Arithmetika.

Elahe Aminifar University of Wollongong

Post-secondary

Evaluation of Students Fundamental Mathematics Skills

The decline in students wanting to study mathematics at school leads to students entering university who are ill-equipped to handle the mathematics required in their degree schemes. Consequently there is a high failure rate amongst students taking first year mathematics subjects. This is a problem facing universities throughout Australia. The aim of this investigation was to identify the mathematical skills that such students lack, providing feedback to lecturers and tutors by identifying areas where extra help is required and learning resources developed.

Judy Anderson University of Sydney

Primary 3-6, Secondary 7-10 & Post secondary

Problem Solving and International Studies

Problem solving, as described in Working Mathematically, is an important part of the K-10 curriculum. Recent international studies have explored the problem-solving abilities of our students and the teaching strategies used by our teachers. This presentation will examine some of the results and provide advice for teachers.

Richard Andrew Oxford Falls Grammar School

Secondary 11-12

Introducing Graphic Calculators into General Mathematics ... Is it really worth it?

Heard the stories about schools with class sets of Graphics Calculators locked away in cupboards, rarely used? Been considering introducing Graphics Calculators into General Maths but aren't as yet convinced its all worth it?

OR . You've taken the first tentative steps but are far from confident with the little beasts?

If yes, then this session, 'The Beginner's Journey', is for you.

Wins, pitfalls (avoiding them), teaching tips for first-time users, the benefits, feeling OK with not-knowing-it-all, Gen-Maths-specific worksheets, skill-drill sheets and other handouts will be provided.

Ric Morante OTEN – Learning Materials Productions

Janine Angove Hotmaths

Secondary 7-10

Learning Material designed by DET

The Centre for Learning Innovation is a section of DET devoted to developing both print and on-line learning material to support teachers and students. This session will review this material, providing you

with insight into what is available, how to access it and how it can be used to assist you and your students by providing you with material that covers all aspects of the 7 - 10 Mathematics syllabus for NSW.

Stephen Arnold

Australian Catholic University, ACT

Secondary 7-12 & Post-Secondary

What's new in Maths Software 2005

In the tradition of showcasing some of the best (usually free) software for mathematics teaching and learning, this session looks at two wonderful software resources, with particular applications for secondary classrooms: EigenMath (a free cross-platform graphing and computer algebra system) and SimCalc MathWorlds, a remarkable mathematics learning experience which is also free and cross-platform, and links a variety of technologies (desktop computers, handheld graphic calculators and even new wireless classroom technologies) in a form which offers powerful and effective learning opportunities for making mathematics meaningful for all students.

Catherine Attard

Holy Cross Primary Glenwood

Karen McDaid

Holy Cross Primary Glenwood

Primary 3-6

Lost in Space.

Presentation of a selection of 2D and 3D space tasks for children in the middle years using hands-on learning tools such as geoboards & paper folding.

Catherine Attard

Holy Cross Primary Glenwood

Karen McDaid

Holy Cross Primary Glenwood

Primary 3-6

Physical fun with fractions

Presentation of a selection of fraction tasks for children in the middle years using co-operative learning strategies and a multiple intelligence approach. Participants will engage in a range of interactive activities that encompass a variety of learning styles.

Paul Ayres

University of New South Wales

Primary K-6 & Secondary 7-12

Why constructivist teaching does not add up

Constructivism is based on a philosophical belief about how knowledge is constructed. It is widely supported by mathematics educators but not teachers. This presentation argues a number of reasons why this approach to teaching mathematics is flawed, including 1) it fails to acknowledge the broader research on effective teaching; 2) it fails to understand human cognitive architecture and the impact of prior knowledge on teaching strategies; 3) it fails to provide proper scientific empirical evidence that constructivism works; 4) it has led to a loss in confidence in teaching standards, particularly in the US where there has been the "maths wars".

Mary Barnes

Secondary 11-12

Integration: Connecting the big ideas

Beginning integration provides a wonderful opportunity to demonstrate the power and beauty of mathematics. Too often, this opportunity is lost, and integration is presented in a purely technical way. The big ideas in integration are: anti-differentiation and its uses; and the concept of the area of a region with curved boundaries and ways of approximating it. This session will discuss ways to present these ideas and let students explore for themselves the link between them. Ideally, this link should come as a surprise. We will look at how graphics calculators can assist with this, in ways that carry visual impact.

Mary Barnes

Secondary 7-12

Collaborative learning: Engaging students in small-group activities

How can teachers best promote effective interaction within groups? What can be done to avoid groups becoming frustrated and stuck, or bored and off-task? Drawing on observations made during my recent research on collaborative learning, this session will discuss some of the strategies teachers can use while groups are at work: what to look for when observing from a distance; when and how to intervene; asking 'good' questions; and what to say if they ask if they are on the right track, or claim to have finished; reporting-back and whole-class discussions.

Margaret Bigelow

MLC Sydney

Will Morony

AAMT

Early childhood, Primary, Secondary & Post-secondary

What do the Professional Teaching Standards mean to you?

Will Morony (Executive Officer of AAMT) and I will explain the Highly Accomplished Teacher of Mathematics (HAToM) project and its uses in the professional development of staff in effective and innovative teaching. We will also encourage teachers to apply for the recognition of HAToM and assist them in beginning their applications.

Janette Bobis

University of Sydney

Emily Bobis

Beacon Hill Primary School

Primary 3-6

Fractions through students' eyes

The views of Stage 3 students regarding what they think they understand and don't understand about fractions and how they think they learn them best will be reported by Emily - a Year 5 student. The workshop will involve practical activities considered by Stage 3 students to have assisted their understanding of fractions.

Fran Bonanno

Catholic Education Office

Bev Dunbar

Catholic Education Office

Maria Alice

Catholic Education Office

Primary K-6

Surprise! Surprise! Look at what I can do! The Sydney Archdiocesan Numeracy Strategy

The session will focus upon the revelations and discoveries made about student learning through the Sydney Archdiocesan Numeracy strategy. There will be a brief outline of the key practices adopted by teachers in Sydney Catholic Schools. We will look at how deep questioning has allowed students to surprise teachers with what they know and understand. There will be ideas for lesson starters and mental warm-ups and other great teaching ideas.

Amanda Brooker

Bethany College

Secondary 7-10

Creating a self-paced learning environment for Years 7 and 8

In response to the new syllabus requirement that every student should progress at his/her own rate, we have created an entirely self-paced learning environment in our Middle School at Bethany College. We have found many benefits for both students and teachers, some expected and some less so, as well as encountering some problems and difficulties. I will discuss these, and our methods of implementation, in the workshop. Overall, the new system is proving very beneficial for our students

Russell Brown

Bendigo Senior Secondary College

Secondary 11-12

A practical mathematics classroom using a motion detector

Motion detectors are invaluable and relatively inexpensive aids in teaching mathematics in a fun and practical way. It is ideal for the kinaesthetic learners in your classroom. Activities can be developed for middle school through to senior classes. The motion detectors interface directly with computers and with most graphics calculators. This hands-on session will use graphics calculators with the motion detectors. Areas covered will include motion (distance - time graphs), linear and quadratic modelling, exponential decay and statistics.

Equipment will be supplied but if you have your own graphics calculator and/or motion detector bring it along to the session.

Russell Brown

Bendigo Senior Secondary College

Secondary 11-12

Get active with TI-Interactive!

Want to use computers more in the mathematics classroom? This workshop session will use TI-Interactive!, a unique educational software package that is a word processor with integrated mathematical systems, including a Symbolic Computer Algebra System (CAS), function graphing, data editing and plotting, regression analysis, matrix manipulation, spreadsheet operations and connectivity to the web.

Watch the worksheet automatically change as you change a value in the list editor! The statistics plot will automatically change, as will the regression equation and its graph. It is truly alive! A trial version of the software is available from the web.

James Burnett

Queensland University of Technology

PRIMARY KEYNOTE

Primary K-6

Promoting Algebraic Thinking in the Primary Years

In the primary school, algebra should be developed as a way of thinking that supports other strands of the mathematics syllabus, and provides a foundation for more formal work later. This keynote session will describe appropriate activities that will help achieve these aims and will, in particular, show how to bridge from patterns to algebra in a logical and meaningful manner.

James taught for several years in Brisbane and rural Queensland before completing a Masters degree in mathematics curriculum. He now frequently presents workshops and speaks at conferences throughout Australia, New Zealand and North America. He has authored and co-authored more than 150 mathematics books for teachers and children aged six to twelve. Together with Calvin and Rosemary Irons, he has just completed Queensland's first Prep to Year 7 core mathematics program.

As managing director of ORIGO Education, James strives to lift the profile of mathematics through dynamic professional development, the annual Groundworks conference and the development of quality research-based materials for the classroom

James Burnett

Queensland University of Technology

Primary K-6

Using Visual Models to Develop Number Fact Strategies

Simple visual aides and models should be used to help students form a mind picture that links to the thinking strategy. This session will demonstrate the use of these aides and show how the thinking strategies can be generalised and extended beyond the number fact range.

Anita Chin

DET, North Ryde

Primary 3-6

Developing algebraic thinking through number pattern

How can we engage students in working mathematically to enhance quality teaching and learning? This hands-on workshop will include practical ideas and activities for linking students understanding of patterns to particular aspects of the number strand. Participants will examine the use of explicit teacher questioning to facilitate the teaching and learning of the working mathematically processes. Black line masters will be included in the workshop package.

Zac Cohan

World of Worlds Software

Secondary 7-12 & Post secondary

The Next Evolution of the Calculator

Seven months ago, we realised that nearly all students, despite purchasing fancy \$2,000 computers still use physical scientific calculators for all their homework because nothing exists in the computing world to help them. We had a vision for a new kind of calculator, one that would revolutionise the way students and adults did mathematics on their computers. We have finally completed it and it has turned out insanely great.

Nick Connolly

Educational Assessment Australia

Primary K-6, Secondary 7-12 & Post-secondary

The Secret Life of a Mathematics Question

Expert advice and good practice for writing questions for mathematics tests.

The presentation will discuss the basic theory of good item design in mathematics tests and will draw on examples from the Australian Schools

Mathematics Assessment and other testing programmes. Other topics covered will include the design of effective multiple choice questions, the design of items for diagnostic tests and potential pit-falls in the writing of mathematics problems.

Tobias Cooper

PLC Sydney

Secondary 7-12

Investigating 2D/3D shapes with technology

Participants will use Poly, Wingeom, Word and Geometers Sketchpad to investigate the properties of 2D/3D shapes. Videos from the internet showing cross sectional slicing of cards will also be shown.

Tobias Cooper

PLC Sydney

Secondary 7-12

Investigation the Number Plane with technology

Investigate a range of functions with Winplot, Fx Draw and FxGraph3. Participants will learn how to plot points, graph functions, draw gradient functions, find intercepts and much more. Learn how to import any results into Word and manipulate these results.

Tobias Cooper

PLC Sydney

Secondary 7-12

Unlocking the secrets of Geometers Sketchpad

Participants will investigate functions and 2D shapes. Learn how to use parameters, sliders and custom tools and much much more.

Geoff Dix

Rosebank College

Secondary 7-12

Dynamic Geometry : Beyond Geometry

Using Wingeom for simulations and concept development, from Extension 1 to Year 7. The presentations adapt to Geometers Sketchpad (GSP) and Cabri, and include projectile motion, external division of a line, latitude & longitude, volume of pyramids, algebraic modelling, treasure hunts and more.

Paula Donkin

Educational Assessment Australia

Secondary 7-10

Testing with a twist: assessment ideas for Years 7 to 10

How can formative assessment be used easily and successfully in the classroom?

How can we make sure the students learn the things they got wrong in the test?

How can we use diagnostic tests to plan units of work?

How can we use diagnostic tests to plan units of work?

How can we avoid the "set and forget" approach to class test

These are strategies that real teachers are using based on research interviews.

Peter Fox

Elisabeth Murdoch College

Secondary 7-12

Focusing on Parabolas

"99% of quadratic equations are factorised in mathematics classrooms". Paper folding, dynamic geometry, graphics calculators and video analysis software can be combined to give students a much richer understanding of a parabolic curve. A simple paperfolding exercise brings understanding to the use of dynamic geometry and how it can be used to illustrate properties of a parabolic curve. Participants will see how easy it is to collect data for a bouncing ball and accurately model the ball's motion. Computer software will be used to study the motion of a basketball. Participants will also find out how to access most of this equipment/software for free.

Peter Fox

Elisabeth Murdoch College

Secondary 11-12

Connecting Trigonometry and Calculus

It is important for students to connect mathematical concepts. Data will be collected for the motion of a pendulum. Participants will generate graphs to model the position of the pendulum using trigonometric functions. The velocity of the pendulum can be determine using calculus. Participants will see how students can relate the physical motion of the pendulum to make connections and create a better understanding of trigonometry and calculus.

Ruth Gardner

Shellharbour District Office

Primary 3-6

Using SNAP data to inform teaching

How much notice have you paid to SNAP questions? What does SNAP data tell us? Do you get ALL of the information? How can High Schools share this information with feeder schools?

How can SNAP analysis start the "Numeracy across the KLAs" conversation in your school? Examples of how schools are actively using SNAP information will be provides

KEYNOTE ADDRESS Primary K-6 & Secondary 7-12**How do you know?**

Assessment can have a range of purposes in teaching. When we assess students we often seek to find out what mathematics they know. Yet, which mathematics are we interested in? Karl Weierstrass once said that a mathematician who is not also something of a poet will never be a complete mathematician. Do we ever assess the poetry of mathematics?

Sometimes in mathematics we want to know what students can recall, which procedures they can carry out and what they understand and can explain. If reasoning is central to mathematics, how do we assess it and what do we do with the information when we have it?

Peter Gould is the Chief Education Officer in Mathematics with the NSW Department of Education and Training. His primary responsibilities are in the design and delivery of effective mathematics curriculum support from Kindergarten to Year 12. Peter taught in the South Western suburbs of Sydney for the first 13 years of his teaching career. He was Head Teacher of Mathematics at Canley Vale High School before taking up a position as a Regional Mathematics Consultant K-12. He enjoys learning and teaching and has been taught many things by his students and his fellow teachers. Peter has helped out with mathematics curriculum development projects in Papua New Guinea and has been the Chair of the secondary Mathematics Board Curriculum Committee. His current research (or obsession) is in the area of fraction learning.

Genevieve Green

MLC Sydney

Secondary 11-12

Simple Vectors - The i's Have It

This session will look at the use of vectors in complex numbers. It is designed for teachers who have some basic knowledge of the Complex Numbers topic of the Extension 2 syllabus but who are relatively inexperienced, or need a refresher in the use of vectors.

Sarah Hamper

Tara Anglican School

Secondary 11-12

Using ICT to Teach 2U Mathematics

This session will cover some innovative ways to teach aspects of the topics of Integration and Trigonometry using using amazing colourful visual aids and Fx-Draw, Fx-Graph, as well as some java applets available on the Internet, applicable to the NSW (2 Unit) Mathematics Course. Some trigonometric concepts are also relevant to yr 10 students (Adv/ 5:3 courses).

Anthony Harradine

Noel Baker Centre for School Mathematics

SECONDARY KEYNOTE Secondary 7-12**What might it mean for mathematics to be, and stay, alive?**

Living things, worth interacting with, often have outputs we enjoy or assist us to make outputs we are proud of. Is this true of school mathematics?

Living things, worth interacting with, often hold mysteries we enjoy trying to unravel. Is this true of school mathematics?

Some living things adapt to their environment, others die when the environment changes. Has mathematics adapted to an environment that now includes powerful electronic technology? Can school mathematics?

Come along and experience some middle/secondary school mathematical activities (that include the use of electronic technology) that aim to result in:

- * student outputs of which they can be proud,
- * support for students in unraveling one of the beautiful 'mysteries', that of abstractions, as well as,
- * supporting students to pass a test.

It will hopefully be an enlivening experience.

Anthony is presently Director of the Noel Baker Centre for School Mathematics, Prince Alfred College in Adelaide, Australia. He has taught mathematics in schools for the last 20 plus years.

Since 1990 Anthony has been actively involved in the process of integrating the use of electronic technology into the teaching, learning and doing of mathematics. He established computer rooms at both Blackfriars Priory School and Prince Alfred College that are used exclusively in the teaching, learning and doing of mathematics. More recently he has established programs and learning materials within PAC that ensure the appropriate integration of electronic technology (computers and graphic calculators) into the learning of mathematics. These materials have been shared with many teachers outside Princes.

He has been involved for many years with the delivery of professional development initiatives. Most recently through the LUMAT, TIGM and SeniorSchoolCensus-online projects in Australia and the New Zealand government's Computer Algebra pilot project.

He has a passion for mathematics, the mathematical education of our youth and the professional growth of mathematics teachers.

Anthony Harradine
Stuart Palmer

Noel Baker Centre for School Mathematics
PLC Sydney

Secondary 11-12

Student success with Annuities in General Mathematics and TIGM?

If you find the teaching of the financial section of the General Mathematics course challenging and your students find learning it hard then this session is for you. The session will have three parts.

Anthony will focus on the teaching and learning of this section. A method will be demonstrated that incorporates the use of electronic technology and which allows students to see the workings of each concept clearly and simply and builds to the formulae.

Stuart will focus on using the formulae for compound interest, future value and present value (as on the HSC Formula Sheet) and the functionality of the EQUA mode of the Casio 9850 GB Plus, to answer HSC-style questions

Finally details of professional development program called TIGM will be explained. TIGM offers the sort of materials shown in this workshop - at no charge.

Anthony Harradine

Noel Baker Centre for School Mathematics

Secondary 11-12

A learning sequence that might have students 'rate' calculus in your classroom

We all know that calculus is important and exciting, but how do we make this clear to students who are studying a course with a high stake exam at the end? During this session you will be introduced to a teaching and learning sequence that drives the need for such things as the chain rule, product rule and so on. All this wrapped in some simple, but engaging and non-contrived contexts.

This approach can be employed as a teacher directed sequence or with a more student centred approach.

Anthony Harradine

Noel Baker Centre for School Mathematics

Secondary 7-10

Working algebraically and developing algebraic sense - as a priority.

In most introductory algebra classrooms of the world the highest priorities seem to be algorithms (learning and practicing them) like adding like terms, expanding brackets and so on. During this session you will see an alternative to this. It does not downplay the importance of said algorithms, but builds a foundation on which they can be built successfully. This approach has the students asking for the algorithms! The approach employs a revolutionary use of a Computer Algebra System (CAS) as well as use of an interactive geometry system (IGS). During the session we will use the CAS and IGS on the Casio ClassPad 300

Ian Harrison DET Curriculum, Ryde

Primary K-6

ASSESSING - What you need to know to teach

William and Black call it Assessment for Learning, and they call others Assessment of Learning. Busy teachers only have one opportunity for one or the other. This workshop shows how to do both without assessing more often.

Ian Harrison DET Curriculum, Ryde

Primary K-6

The proper use of pencil and paper mathematics

Paper and pencil mathematics needs to be used correctly for developing thinking and concepts. Paper can be very flexible and easy to use in all areas of mathematics. Participants will walk away with a wealth of strategies for efficient use of paper in mathematical investigations - so save a tree or two!

Judy Hartnett Brisbane Catholic Education

Primary K-6

Using a strategies approach to organise the teaching of computation

Mental Computation is a current focus in syllabus documents in Australia and overseas. Teachers see the need for such a change in focus from traditional algorithms to a strategy based approach but can find organising a program of learning around this topic difficult. In this session teachers will be led through a proposed structure for organising the development of computation strategies across the primary years accompanied by activities and games for each strategy.

Sue Hobden Bundanoon Public School

Primary K-6

UK Numeracy Project

Sue is part of the NSW Teacher Exchange Program and is at Bundanoon Public School in the Southern Highlands. In England she was part of the development of the UK Numeracy Project. Sue will walk you through the website and the interactive sites that cover fractions, capacity, time, 4 operations and many more. You will be able to use this site immediately back in your classroom.

Rebecca Hudson University of Wollongong

Secondary 7-12 & Post-secondary

Leadership and Professional Development: Encouraging Mathematics Teachers to Integrate Technology in Teaching

Teacher support in implementing technology use in the mathematics classroom is critical. They need training and professional development whether it is initiated by the leadership of the principal, head teacher, technology consultant or teachers themselves. It has been proven that effective leaders are those who, often in the most basic ways, create opportunities and galvanised commitment, encouraging colleagues into action so that collaborative effort becomes rewarding and important. In this paper, responses to survey of mathematics teacher, mathematics head teacher, professors, technology consultants

and school heads about who should fulfill the role of assisting teachers to integrate technology into mathematics teaching, is presented.

Tracey Hughes-Butters

Lumen Christi Catholic College

Secondary 7-12

FEELIN' HOTS, HOTS, HOTS!!!!

This is a repeat performance of last year's presentation with some added extras. With all the hype about productive pedagogies, this is how one maths teacher is implementing various strategies. We'll look at ways to deal with the various learning styles encountered in the classroom; implementing Blooms taxonomy into the Mathematics curriculum; how to cope with parallel streaming and nurture student-centred learning; what makes an exciting and vibrant mathematics classroom with kids that want to learn. Ideas, strategies, rich tasks and activities that promote deep understanding and knowledge - with lots of fun thrown in for good measure!!!

Tracey Hughes-Butters

Lumen Christi Catholic College

Secondary 7-12

IT'S SIMPLY MATH-TASTIC!!!!

A session of fun, frivolity and down-right silliness! Activities that help to make my classroom a place where kids want to learn, and enjoy doing so in the process. We'll play games that will leave students exhausted, fit and mathematically more adept. If you're into a bit of giggle and don't mind actually getting up and being involved, come and join me for a mathematical extravaganza!!!!

Janet Hunter

St Catherine's Waverley

Secondary 7-12 & Post-secondary

The Values of a Mathematics Education

The Federal Government has recently mandated that core values from 'a fair go' to 'tolerance' should be imparted in schools. Should this be left to the realm of pastoral carers and Religious Studies teachers or does the rigour of Mathematics lend itself to the formation of values? This session will touch on notions such as a 'liberal education', scepticism and 'legitimation crisis'.

Nagla Jebeile

DET, Sydney Region

Secondary 11-12

Assessment for Learning in the General Mathematics Classroom

This workshop will explore classroom activities that engage and motivate General Mathematics students. We will look at a range of practical strategies for involving students in Assessment for Learning activities and hands-on tasks with the aim of deepening their understanding of mathematical concepts.

Kuldip Khehra

Erskine Park High School

Secondary 7-10

Little Ideas that engage and motivate students

Simple little ideas that have worked, especially with remedial and unmotivated students. Lots of games dealing with the topic of algebra, directed number and decimals. Also 'twister' with triangles, the real kinesthetic game. In addition, how to promote literacy in maths (eg scrabble, using the alphabet and incorporating mathematics at the same time). Playing Lotto (\$\$\$) with the graphics calculator and using the random function when playing games. Assignments, how to make them different literally!

Barry Kissane

Murdoch University

Secondary 7-12

Bringing space and measurement alive with the ClassPad 300

This hands-on workshop explores the opportunity to support student learning in space and measurement using hand-held technology more sophisticated than a graphics calculator. We will use Casio's ClassPad 300 to consider and evaluate opportunities for interactive learning by secondary school students in a range of areas, including aspects of elementary geometry, mensuration, coordinate geometry, transformations, conics and functions. It will be assumed that participants are unfamiliar with the use of this particular device, so that appropriate support will be provided, but the main focus will be on the teaching and learning issues raised by its use.

Barry Kissane

Murdoch University

Secondary 11-12

Bringing calculus alive with a graphics calculator

Although a graphics calculator is essentially a discrete device, it offers a number of opportunities to explore ideas associated with introductory calculus and thus to enrich student learning. In this hands-on workshop, we will explore some of these ideas on the new Casio fx-9860G AU graphics calculator. Opportunities for students to explore limits, continuity, derivatives and integrals will be presented and discussed and their significance for supporting the learning the concepts of calculus evaluated. No experience with this (or other) graphics calculators will be assumed.

Sue Lawes

Buninyong Public School

Dianne Dow

Dubbo Schools Office

Primary K-6

Maths Rallies / Fun Days

A maths consultant and practising teacher will demonstrate with practical activities how to enthuse children in the learning of mathematics - problem solving/working mathematically are involved.

Pat Leberne

DET, Sydney Region

Primary 3-6

Adding Depth to Space and Geometry

Practical classroom strategies to develop a deep knowledge of the Space and Geometry strand of the K-6 mathematics syllabus with a focus on the Working Mathematically processes. This is a "hands-on" workshop.

Trish Leigh

Harcourt Education

Primary K-6

Integrating computer activities and problem solving into your numeracy program

The focus of this session will be to involve teachers in integrating a variety of computer activities (using Word, Excel, Kidpix) and open ended problem solving activities to help create a balanced and motivating Numeracy program in their classrooms.

Practical ideas and activities for catering for a variety of student ability levels in the classroom will also be outlined.

Trish Leigh is co-author of MathsTracks, Rigby's NSW K-6 Maths series. She has been teaching for over 25 years, with experience across all Primary year levels.

John Ley

Caroline Chisholm College

Secondary 7-10

Using spreadsheets to enhance the learning of mathematics in stages 4 and 5

A three year project started at Caroline Chisholm has resulted in the publication of a workbook and CD that covers all spreadsheet ICT skills required for the year 10 exam and more. Non computer people are able to use this resource as it is completely self contained with the CD demonstrating all skills needed and worked solutions in real time. The Stage 4 book, used by over 80 schools, will be demonstrated and the Stage 5 book and CD will be launched. Some free copies available as lucky door prizes.

John Ley

Caroline Chisholm College

Secondary 7-10

Using technology in stages 4 and 5.

The new Insight mathematics series of texts for stages 4 and 5, published by Oxford University Press, contain a number of software items, spreadsheets and Internet activities. Come along and learn more of how to use this series to enhance your students learning of mathematics.

Bruce Llewellyn

DET, Murwillumbah Office

Primary 5-6 & Secondary 7-10

Simple paper folding and why it works

This workshop examines a range of simple paper folding investigations, some using A4 paper, giving geometric explanations for why they work.

Sharon London

HOTmaths

Janine Angove

HOTmaths

Secondary 7-10

Learning Online

Discover a range of mathematics learning tools already being trialled in NSW schools. The HOTmaths Learning System provides students, teachers and parents with tutorials, problem solving, open tasks, animations, interactive investigations, print materials and assessment tasks, aimed at supporting classroom and home learning. All work online is automatically marked, providing students, teachers and parents with a profile of HOTmaths Learning System is being developed in conjunction with the Learning Design Team at the DET Centre for Learning Innovation (CLI) learning and progress. The

Inta Long

DET, Batemans Bay

Robyn Rennie

DET, Batemans Bay

Primary K-6

Teaching How to Solve Problems

A practical workshop looking at what problem solving strategies are and ways in which to incorporate them into your classroom practice.

Jim Lowe

Redcliffe State High School

Secondary 7-12

MathsBots - Applications of robotic devices in the mathematics classroom

The use of robots provides unique opportunities for students to apply maths in a context that is engaging and exciting. This workshop looks at maths activities that are crucial to the correct functioning of the device, ie it is the maths not the robot at the focus of the activity. The devices are low cost and controlled by a calculator. Some can even be built using parts from your local hobby shop.

Jim Lowe Redcliffe State High School

Secondary 7-12

Interactive Geometry

Interactive geometry software has been available for some time. Versions are now available for use on calculators. This workshop will examine the features of the calculator version of Cabri. Student activities linking geometry and algebra in both the lower and upper secondary curriculum will be demonstrated.

Rod Lyon Quirindi High School

Secondary 7-12

Catering for Different Learning Styles

Maths is a process of following a series of logical steps in order to achieve a solution to a problem.

Students can be given some logic tasks to encourage their learning.

I will hand out a collection of interesting and / or fun worksheets that I use in my classroom as techniques to promote learning.

Anthony Mahoney St Augustine's College, Sydney

Secondary 7-12

Teaching Ideas that have worked for me

A session which gives some practical teaching ideas that have worked for me as a teacher. Participants will be able to discuss and participate in activities which encourage cooperative learning and higher order thinking. I have found that these activities motivate and stimulate my students to enjoy Mathematics. You will be able to take away copies of the activities and ideas for writing and organizing your own activities.

Anthony Mahoney St Augustine's College, Sydney

Secondary 7-12

Practical Ideas for Teaching Probability, Algebra & Number

A session which gives some practical teaching ideas for teaching probability, number and algebra to students in Years 7 - 12. An array of activities, games, puzzles, applications to real life situations, investigations, interesting ways to introduce lessons and challenging higher order questions will be presented. I have used all of these activities in the classroom and found them to be useful in motivating students to enjoy mathematics.

Katie Makar University of Queensland

Primary 4-6 & Secondary 7-10

Using technology to investigate data in Years 4-9

Want to turn your students into data analysts? This workshop will examine open-ended investigations where students collect and analyse data to explore their own hypotheses and create their own graphs. Hands on experience with Tinkerplots, a unique software program designed to support inquiry-based data investigations will be included.

Colin Marr Wauchope High School

Secondary 7-10

An individualised system for outcomes-based curriculum

An overview of an individualised and unitised system for teaching the Stage 3, 4 and 5 outcomes-based mathematics curriculum. Using the Notre Dame High School (Glasgow, Scotland) model which utilised SMP booklets. This is an entire system which allows for School-Based Referencing (so no additional costs for resources); individualised tracking of each student's individual program; assessments and classroom management procedures. This system is a way that outcomes can be taught and assessed effectively.

Sue MacGibon

Port Macquarie Education Office

Secondary 7-12

A major issue arising from as early as SNAP is the high level of literacy demands on students. This workshop is designed to address the literacy demands of the School Certificate for the students - outlining the 3 level guide approach to recognize the requirements of the question and how to answer that particular type of questions. Past papers are then used to highlight different parts of the School Certificate. These strategies are easily adaptable to the HSC, particularly for General Students.

Sue McDonald

Brisbane Catholic Education

Primary K-6

Exploring aspects of Numeracy through Children's Literature

Children's literature including picture books provides a wealth of opportunity for the development of mathematical skills and concepts. When children (and their teachers) are familiar with a book (story and illustrations), planning for mathematical development and assessment is related and relevant.

In this session, participants will be guided through an example and will be encouraged to utilise the activities and investigations presented. The activities and investigations are multi-level, inquiry-based and cover the range of mathematical strands

Carolyn McGinty

DET, State North Ryde

Secondary 11-12

Inverse Functions and Inverse Trigonometric Functions - A Different Approach

The concept of an inverse function is really the essence of this Extension 1 topic. How often do we rush through this big concept to jump into inverse trig functions where students may struggle to understand restricting the domain to create a function. This workshop will provide an opportunity to engage in some activities that may assist students to develop a deep understanding of inverse functions. Participants will receive a CD of the unit of work.

Heather McMaster

Turrumurra High School

Primary 5-6 & Secondary 7-10

Working Mathematically with Data

In the new syllabus, some important new emphases have been given to the Data strand. Students need to know more than just ways of displaying data and reading those displays. They need to know why one form of display or one type of average (mean, median or mode) is better than another in a particular situation, and be able to identify misrepresentations. Emphasis has also placed on methods of data collection and making predictions from samples.

In this workshop, participants will experience a variety of activities using first-hand and realistic data that will get kids thinking. Each activity satisfies specific requirements of the Stage 4 syllabus and develops a sound basis for the understanding of statistical concepts in future stages.

Diane McPhail

DET - SW Sydney Region

Primary K-6

101 uses for the 100 chart

The 100 chart, presented as a wall chart, OHT, or individual copies on students' desks, provides a simple and versatile classroom resource. This workshop will focus on practical activities which may assist to develop concepts of place value, patterning and the four operations in Stages 1 and 2.

Cathy McRae

R.I.C. Publications

Primary K-6 & Secondary 7-10

Making the most of games: Lesson learned from playing Numero

Games have been advocated as a means of encouraging children to learn mathematics. Often it is simply assumed that by playing a game children will learn what the teacher intended them to learn. Clearly this is not the case. This workshop will outline the factors that help to maximise the learning opportunities presented in games. The game Numero©, aimed at teaching mental computation and strategy skills to students of all ages, will be used in this practical workshop.

Alan McSeveny

Sign Post Publishing

Primary K-6 & Secondary 7-10

Probability (Chance) Years K - 10

The new NSW Syllabus has brought Chance to Years K-6. We will examine the development of chance concepts in years K to 10 and consider creative ways of developing these concepts.

Jack Mock

Barker College

Secondary 7-10

Stage 5 Maths - Some Teaching Suggestions

I wish to share some ideas and teaching strategies to assist students in preparing for or deciding to study one of the Calculus based Mathematics courses from either completing 5.2 or 5.3. This will impact on what we teach in Year 9 and in Year 10. Please bring along your K to 10 syllabus document.

Christine Murray

DET, Sydney Region

Primary 3-6

What's the Question?

How can we deepen students' understanding and raise the intellectual quality in our classrooms? Through effective questioning, we can engage students and develop their ability to think and work mathematically.

Mark O'Brien

OTRnet

Secondary 7-10

Cooperative Learning in the Maths Classroom

"Research on how people learn has suggested that learning is a social process and that cooperative learning activities are essential if students are able to construct their own knowledge" Alice F Artzt & Claire M Newman

As mathematics teachers we are not traditionally highly skilled in allowing students to work cooperatively. However, there is a lot of information available on both the how and why of cooperative learning and this presentation aims to impart some of that information and also some of the presenters experience from the classroom

Mark O'Brien

OTRnet

Secondary 7-10

Exploring and Applying Quadratic Function

This session will be based around activities and applications from the Integrated Maths Modules. It will look at both activities to immerse students in and explore quadratic functions, as well as applications to allow students to apply the concepts in non-routine, contextual situations.

The aims of the session will be twofold:

To familiarise participants with some resources they can use with quadratics

To promote the ideas of immersion of students into their learning and the subsequent application of their understandings.

A graphics calculator will be useful for this session

Kay Owens

Charles Sturt University

Primary K-6

The dangerous swing to rote learning

This paper will issue a challenge to teachers who feel comfortable with the usual whole class drill of counting and sounds, times table and other quick quizzes. It will look at how to meet the needs of individuals better, while still providing positive reinforcement for students.

Kay Owens

Charles Sturt University

Secondary 7-10

Counting systems - examples for Papua New Guinea

There are 800 distinct languages and cultures in PNG. They are used now and they have their own ways of counting. Most do not have a base 10 system. Stage 4 includes these as content. This paper will provide some activities and background to make number system come alive for your classes.

Cassandra Portelli

Port Macquarie High School

Secondary 7-10

PACEing Yourself - an approach to differentiating the curriculum for GATS

Challenged to teach without a blackboard or a text for a year, these are some units of work that have been trialled in the classroom. Designed to cater for Gifted and Talented and Students (GATS). The processes can be adapted for any level or year that would benefit from some curriculum differentiation.

Anne Prescott

UTS

Secondary 11-12

Teaching Projectile Motion

Student misconceptions about projectiles make it very difficult for students to understand what is happening. They resort to learning the techniques of solving projectile motion questions without them understanding its processes. This presentation will show ways students can be helped to make sense of projectile motion.

Jon Roberts

Loreto College, Marryatville

Secondary 11-12

Using the Graphics Calculator in the Calculus Classroom

No previous experience required. Activities that support student learning and skill development will be presented. The workshop will deal with student attitudes and the critical use of electronic technology while students are learning, checking, doing and using Mathematics.

Jon Roberts

Loreto College, Marryatville

Secondary 11-12

Exploring Changing Quantities by modelling their derivatives

Motivate the study of Differential Equations through the use of real world data. Contexts considered will include Population Growth, Running Races and Heat Transfer. Technology will be used to estimate and to model the derivatives of naturally changing quantities. The behaviour of the changing quantity can then be inferred by solving the resulting initial value problem. Spreadsheets and/or graphics calculators can be used. Both methods will be considered. Bring a graphics calculator if you wish to work through the small data set examples.

Mark Roddy

University of Western Sydney

Primary 3-6 & Secondary 7-8

Discount and Variety Store Maths!

You've shopped at the Discount and Variety Store and you've taught maths. Ever think about combining the two? Come and learn how teachers are using the inexpensive and fun materials available at the Discount and Variety store to implement active learning in maths in Years 3 - 8. Use the presenter's website to become part of a network of teachers around the world who are using, creating and sharing ideas for the use of these activities.

Robert Rook Mathplot

Primary K-6

Mathplot - Using computers in a primary classroom or with struggling students.

The session will run through using Mathplot in the classroom for years 4/5/6 and struggling/integration students in years 7/8. Among the topics covered are counting, place value, number, fractions, time, money, to name a few. All participants will receive a free licensed version to load on their school's network to use with their students. Manual and teacher worksheets are also included to allow teachers to start in their next class. This program will also be available for free to students.

Robert Rook Mathplot

Secondary 7-10

Mathplot - Using computers in a maths classroom (7 - 10)

Topics covered are graphing, consumer maths, fractions, geometry, measurement, mensuration, percentage, plotting, spatial relations, statistics, tessellations, trigonometry, probability, to name a few. Use of the new worksheet generator, tutor and printing of homework and workbooks will also be shown.

All participants will receive a free registered copy of the latest CD to take and load on their home computers.

John Ryan Roseville College

Secondary 7-12

Short questions, worked examples and review sheets - The 3 pillars of success

Over the last few years, I have developed this notion into a really successful formula. My students evaluation sheets tell me so. I will convince you that short questions are more than just a settler for a lively class plus share lots of other strategies for beginning teachers and experienced practitioners alike.

Alan Sadler Rossmoyne Senior High

Secondary 7-12

These have worked for me

In this session I will share some ideas, give some tips and suggest some strategies that have worked for me. Nothing too technical, nothing too hard to implement, just good ideas for use in the classroom. The ideas will touch on a variety of mathematical topics across the secondary range. Hopefully some will appeal to you and you will be able to try them in your classroom.

Alan is a teacher of Mathematics at Rossmoyne Senior High School in Perth, WA and was a Keynote presenter at the MANSW Mudgee conference last year

Marty Schmude St Joseph's College, Hunters Hill

Secondary 11-12

General Maths - does a graphics calculator offer an advantage in the HSC exam?

Peter Taylor Australian Mathematics Trust

Secondary 7-12

Problems to enrich Mathematics Learning

I will discuss which type of mathematical topics are useful for enriching the learning of students of various standards and propose some representative problems to illustrate them. I will also show what resources are available to help teachers access further material in a systematic way.

James Taylor Moriah College

Secondary 11-12 & Post-secondary

The Conic Sections

One of the aims of this talk is to examine the remarkable proofs of Dandelin that slices of a cone do indeed yield ellipses, circles, parabolae and hyperbolae. I shall examine other means of generating these loci, including some intriguing results on projectile motion. Finally we look at some elegant proofs based on polynomial theory. All this with some nice graphics and many animations on WinPlot.

Chris Thompson Board of Studies

Primary K-6 & Secondary 7-12

Working Sudokumatically

Sudoku is an addictive and enjoyable game with numbers that has the potential to capture students attention and also be a vehicle for teaching and learning 'working mathematically'

Damien Wanstall Windsor High School

Secondary 7-12

Incorporating Blooms / Gardner and Thinking Skills

A synopsis of how to begin incorporating these into the secondary maths classroom and how you can begin seeding the process, as a Head Teacher.

Jenni Way University of Sydney

Primary K-6

Using Learning Objects in the Primary Classroom

This workshop explores the nature and use of multimedia learning objects for mathematics. It includes a presentation on issues and considerations, hands-on investigation of some learning objects and opportunities for questions and discussion.

Cath Whalan DET -- North Ryde

Secondary 7-12

Maximising students' marks in external mathematics exams.

Can students be taught how to maximise their marks in mathematics? What ideas can be learnt from the marking of HSC Mathematics Extension 1 and SNAP? How can these techniques be used effectively in the classroom? This workshop will engage participants in strategies for improving students' success in mathematics, with specific reference to external exams.

Cath Whalan DET, North Ryde

Secondary 11-12

What is the data telling us?

This workshop is intended for faculty leaders and those aspiring to leadership roles. The collection and analysis of a range of data to enhance students' learning outcomes and inform faculty planning in mathematics will be explored. Reference will be made to SNAP, SC and HSC reporting packages available on EDOD (Enhanced Data on Disc).

Allan White UWS Nepean
John Hastings St Vincents College

Secondary 7-12

Graphics Calculators and Mathematical Modelling: Making Cognitive Connections

Skemp (1989) differentiated between instrumental and relational understanding of mathematics. Pedagogical strategies for assisting students to develop relational understanding involved making cognitive connections in their long-term memories. Graphics calculators (GCs) have gained widespread acceptance in secondary school classrooms. They provide a cheap powerful tool for exploring mathematical concepts. Writers have argued how GCs can support, improve and provide new pedagogical approaches in the teaching of the mathematics curriculum. Yet if using GCs in the mathematics classroom is just button pushing, then this would resonate strongly with instrumental learning. How can GCs support the development of relational mathematics understanding? Mathematical modelling is claimed to take learning beyond the walls of the classroom and into the daily lives of the students. Modelling is a process that creates a mathematical context for students to develop strategies for dealing with ambiguity, conflict and uncertainty. Does this process contribute to relational learning? And what happens if modelling and GCs are used together in the classroom? Will they contribute to cognitive connectivity or become automated procedures to be repeatedly reproduced by secondary students? This workshop will involve participants in mathematical modelling while attempting to illustrate these and other related issues in the context of secondary school mathematics. The workshop will use both Texas or Casio GCs so bring your own or you will be able to borrow one for the session. All levels of GC users are welcome.

Ian Wong Australian Bureau Statistics

Primary 5-6 & Secondary 7-12

Australian CensusAtSchool - Real data in the classroom

Access to real data about themselves. CensusAtSchool is an engaging opportunity for all students to use real, raw, Australia-wide data about themselves. The Australian Bureau of Statistics will be conducting an Australian version of the international CensusAtSchool project in 2006. Students take part in an online data collection activity, using questions about themselves. They can then obtain samples of the raw data and use the data to investigate questions of interest to them. Examples of the curriculum support materials (Stages 3 - 5) will be shown.

Ian Wong Australian Bureau Statistics
Anthony Harradine Prince Alfred, College

Primary 5-6 & Secondary 7-12

Using CensusAtSchool Data in the Classroom

This workshop session will lead teachers through using CensusAtSchool data (Stages 3 - 5). The session will familiarise teachers with using the random sampler to obtain data samples from the CensusAtSchool database. MS Excel will be used to work through one of the activities on the web site. During the session teachers will use functions to provide summary information and draw graphs to represent the data. Teachers do not need to be familiar with Excel. The Australian Bureau of Statistics will be conducting an Australian version of the international CensusAtSchool project during 2006.

Andrew Woodgate Pearson Education

Secondary 7-10

Online Learning & New Signpost Mathematics

In this workshop we will explore the features of a flexible, easy to use online learning environment available to schools for free! We will look at how to upload ready made content that supports the outcomes of the NSW stage 4 & 5 Mathematics syllabus. You will see how quick it is to modify and add new questions to create your own personal website. We will see how the online grade book can help you assess your student's results and identify gaps in their knowledge. We will present training and support options to help develop your technology knowledge and skills.

Andrew Woodgate

Pearson Education

Secondary 7-10

Basic Skills in Microsoft Excel & the ICT outcomes

This workshop will cater for absolute beginners through to teachers that want to refresh their skills. You will learn some basic skills in MS Excel. This will allow you to complete a large number of the Stage 4 and 5 Information & Communications Technology (ICT) outcomes from the Patterns & Algebra, Number and Data strands with your students. By the end of the session you will be able to:

Create & save a new worksheet

2. Format the width of the rows and columns.
3. Format Borders, Headings and alignment of cells.
4. Format the cells into numbers, percentages & currency.
6. Converting and Displaying data as graphs & charts
7. Format the worksheet so that you can print it

Catherine Wormald

Primary K-6 & Secondary 7-10

Who are the gifted mathematicians who may also have a learning difficulty?

This presentation considers the identification of students who are mathematically gifted and may have a learning difficulty. It recognises research from the areas of giftedness, learning disabilities and mathematics. Developing a definition relevant to these students and their educational needs will be discussed. There is a distinct lack of parity between the identification of gifted students and learning disabled students.

Definitions of mathematically gifted students will be put forward and, as with all gifted students, more than one form of identification is necessary to appropriately identify mathematically gifted students.

Methods of melding these fields will be discussed in order for appropriate educational programs to be developed.

Robert Yen

Hurlstone Agricultural High School

Secondary 11-12

The Binomial Theorem for Beginners

Why is The Binomial Theorem one of the hardest topics in the Extension 1 course? This is a repeat of a lecture given to students at the South Western Sydney Region Mathematics Extension 1 HSC Study Day, covering all of the complex theory behind nC_k , Pascal's triangle and $(a + x)^n$, and examining the solutions of recent HSC questions. It will be useful for beginning teachers or those who need a refresher course. Develop a deep understanding of this challenging topic. Bring your calculator and lots of working-out paper!

Robert Yen

Hurlstone Agricultural High School

Secondary 7-10

Programming Stage 5-6 pathways with New Century Maths 10

What's happening with Year 10 and the new syllabus next year? This presentation demonstrates how the New Century Maths 10 textbook can be used to program Stage 5 topics for Year 10 and beyond. It looks at developing teaching programs for students across the Stage 5 continuum, including the optional topics that will provide pathways to the Stage 6 senior mathematics courses. There will be a discussion of the new School Certificate grades for 2006, as well as a forum on assessment ideas and resources.