THE MAV 53rd ANNUAL CONFERENCE
1 & 2 December 2016 // La Trobe University, Bundoora
www.mav.vic.edu.au
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Thursday 1 December
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Listing of Sessions by Presenter  121
Introduce students to the basics of coding, a critical skill for 21st century careers in science, technology, engineering and maths (STEM).

Encourage students to explore basic programming using the TI-Nspire™ or TI-84 Plus technology they use every day.

**Beyond Basics**
Encourage students who have some coding experience to build on their knowledge with these innovative activities.

**Teachers’ Lounge**
Find resources to help students develop the foundational logic and mathematics of programming.

Learn more and download FREE TI Codes activities at [education.ti.com/aus-nz/ticodes](http://education.ti.com/aus-nz/ticodes).

Join the conversation #TI Codes

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**Changes to 2016 Conference:**

**Keynote Presentations**
In 2016 Keynote Presentations will run at the beginning of each day. There will be a selection of keynote presentations each morning and you will need to choose one of these to attend.

The keynote presentations will be listed online as Session A (Thursday) and Session F (Friday).

**Keywords**
Each presentation has been given keywords to categorise the presentations:

- Algebra
- Algorithmics
- Assessment
- Coding
- Differentiation
- Fractions
- Games
- Geometry
- Gifted & Talented
- Hands On
- Innovative Models
- Leadership
- Learning Needs (Including disabilities)
- Literacy
- Maths by Inquiry
- Measurement
- Multiplicative Thinking
- Number
- Online Learning
- Probability and Statistics
- Problem Solving
- STEM
- Student Activities
- Technology
- VCAL

**Conference Dinner**
We won’t be holding a conference dinner this year, but will be extending the Happy Hour over 2 hours. This gives all our delegates more time to catch up with each other and exhibitors.
PROGRAM

Thursday 1 December
8:00am Registration & Expo Opens
9:00am - 10:15am Keynote Presentations (Session A)
   1. Burkard Polster (F-12)
   2. Dr Paul Swan (F-12)
   3. Associate Professor Ann Gervasoni (Early Years)
   4. Professor Joanne Mulligan (F-3)
   5. Matt Sexton (Primary)
   6. Rob Vingerhoets (Primary)
   7. Dr Derek Hurrell (5-10)
   8. Russell Tytler (Secondary)
10:15am - 11:00am Morning Tea
11:00am - 12:00pm Session B
11:00am - 1:20pm Session B-C
12:00pm - 12:20pm Change Over
12:20pm - 1:20pm Session C
1:20pm - 2:20pm Lunch
2:20pm - 3:20pm Session D
2:20pm - 4:40pm Session D-E
3:20pm - 3:40pm Change Over
3:40pm - 4:40pm Session E
4:40pm - 6:40pm Happy Hour

Friday 2 December
8:00am Registration & Expo Opens
9:00am - 10:15am Keynote Presentations (Session F)
   1. Marty Ross (F-12)
   2. Dr Rhonda Faragher (F-12)
   3. Professor Janette Bobis (Early Years)
   4. Dr Tracey Muir (Primary)
   5. Professor Doug Clarke (Primary)
   6. Dr Jill Brown (Secondary)
   7. Yvonne Reilly, Jodie Parsons & Thao Huynh (Secondary)
   8. Dr Gaye Williams (Secondary)
10:15am - 11:00am Morning Tea
11:00am - 12:00pm Session G
11:00am - 1:20pm Session G-H
12:00pm - 12:20pm Change Over
12:20pm - 1:20pm Session H
1:20pm - 2:20pm Lunch
2:20pm - 3:20pm Session I
2:20pm - 4:40pm Session I-J
3:20pm - 3:40pm Change Over
3:40pm - 4:40pm Session J

Extended Sessions:
There are three “Extended Sessions” at the conference: A-B, C-D, F-G. These sessions run over two one hour sessions plus the break in between (length will vary depending on presenter/topic). If you are attending an extended session, for example Session A-B this will replace your choices for both Session A and Session B.

VISIT THE CAMBRIDGE STAND AT MAV FOR MORE INFORMATION
www.cambridge.edu.au/education
REGISTRATION INFORMATION

Registration Fees:
- Member Metro One Day: $284
- Member Metro Two Days: $567
- Member Non-Metro One Day: $275
- Member Non-Metro Two Days: $559
- Non-Member One Day: $371
- Non-Member Two Days: $742
- Student One Day: $146
- Student Two Days: $293

Happy Hour (Thursday 1 December) - FREE to registered delegates
Lunch (1 per person, per day) - FREE to registered delegates

All prices are inclusive of 10% GST.

Before you begin you will need to have the following before you start your registration:
1. Your username and password to register online, if unsure ring the MAV office on 61 3 9380 2399.
2. School purchase order number or credit card for payment (only Visa and MasterCard are accepted).
3. Contact at school (Bursar) to approve your registration.
4. List of the sessions you want to attend.

To Register:
1. Go online to http://registration.mav.vic.edu.au/Reg/
2. Log in using your username (email) and password. If logged in correctly it will display your name.
3. Once logged in, click on the box that has the MAV Annual Conference - choose your sessions, social program, food, accommodation, etc then click confirm.
4. Check the summary and amount you have been charged - if you think you are a member but have been charged as a non-member call our office 61 3 9380 2399.
5. Click on either Purchase Order or Pay Online.
6. You will be asked to put in the name, position and email address of a person of authority to sign off on your registration.
7. Click on “Submit” to complete your registration.
8. Print out a copy of your confirmation for your records.
9. You will receive an automatic email response confirming your registration.

If you do not receive this email within 24 hours your registration has not been completed.

Note: After you have registered you may login at any time using your login details to change your sessions or to re-print your confirmation. You cannot change any item that affects the amount transacted and these changes will have to be made by the MAV office.

Inclusions:
The Registration Fee includes (per person) - morning tea for each day registered; 1 lunch voucher for each day registered; attendance at selected sessions; Happy Hour on Thursday 1 December; and access to industry exhibition.

Notes:
- Registrations will NOT be processed without full payment or a school purchase order number.
- Session numbers are limited and the website will indicate when sessions are full.
- Member rates apply to individual members, institutional/school members, Australian Mathematics Associations who are members of AAMT and New Zealand Mathematics educators who are members of the NZAMT.
- The MAV reserves the right to cancel presentations if minimum numbers are not reached.

APPLICATIONS CLOSE Tuesday 1 November 2016 AT 5:00PM

KEYNOTE SPEAKERS - THURSDAY

Burkard Polster - Monash University, VIC
Teaching Maths And YouTube
Years F to 12

In this presentation Burkard will talk about his experiences communicating mathematics as The Mathologer on YouTube and on using his own and other people’s videos in his teaching.

Burkard Polster is a maths lecturer at Monash as well as the university’s resident mathemagician. He is the author of a number of books including “Math goes to the movies (with Marty Ross)”, “Q.E.D. beauty in mathematical proof” and “The mathematics of juggling”. For all his dark secrets check out his website and his YouTube channel: www.qedcat.com / www.YouTube.com/c/mathologer

Dr Paul Swan - WA

Word Questions
Years F to 12

Students with learning difficulties in mathematics often experience difficulties in reading and interpreting mathematical text. The answer is not simply to improve reading ability, although this does help. There are specific issues in the reading of mathematical text and particularly word problems. In this session paul swan will share some of these approaches in a practical manner. Reference will be made to text types, graphics and symbols. Examples will be drawn from a variety of sources including naplan tests. Reference will be made to research in the area of learning difficulties in mathematics and literacy and application will be made to solving word questions in mathematics.

Paul Swan has taught at primary, secondary and tertiary level, with his most recent position as senior lecturer in mathematics education at Edith Cowan University. He now spends time advising Schools and Principals on how to improve the teaching of mathematics in their schools, writes books and develops games. He was awarded his PhD in 2002 for his work on how children make computation choices and how well they execute those choices. He was recently awarded an Honorary Fellowship from the Australian Council of Educational Leadership for his work with school principals.
KEYNOTE SPEAKERS - THURSDAY

Associate Professor Ann Gervasoni - Monash University, VIC
Let’s Count: Families And Educators Working Together To Ignite Children’s Maths Learning And Practical Implications For The First Years Of School Early Years

Let’s Count is a new Australian program and a social justice response to the fact that educational outcomes for children living in disadvantaged communities is statistically lower than for those living in more advantaged circumstances. Let’s Count was designed to specifically support families to assist their young children learn mathematics and develop positive dispositions to learning. This presentation outlines the Let’s Count Program, family and educator responses and insights about young children’s mathematics learning. For example, the Let’s Count research found that by the end of their preschool year, lots of children had already reached many of the mathematics outcomes described in Level 1 of the Australian Curriculum Mathematics. The implications of Let’s Count for children’s transition to school, curriculum and teaching in the early years of school will be explored.

Associate Professor Ann Gervasoni, PhD, MEd (hons), BEd., DipT. Ann Gervasoni is Associate Professor, Numeracy at Monash University. She has extensive experience as a primary school teacher and leader, mathematics education researcher, and leader of system-wide professional learning in metropolitan, regional and rural contexts. Ann is strongly engaged in mathematics education research. She was a member of the research team for the Victorian Early Numeracy Research Project (1999-2001), and Research Director of the Bridging the Numeracy Gap in Low SES and Indigenous Communities Project (DWEER, 2009-2011). She is currently leading research projects focused on the mathematics learning of 3-5 year-old children in family contexts – Let’s Count funded by The Smith Family and Numeracy@Home funded by the Australian Council of Research. Ann’s PhD research focused on intervention in mathematics. She developed the research-based Extending Mathematical Understanding (EMU) Intervention Program for students in Year 1 and the middle years of schooling and an associated Specialist Teacher course which is widely used in Victoria, Western Australia and New South Wales.

Professor Joanne Mulligan - Macquarie University, NSW
Connecting Young Children’s Mathematics Learning Early Years (Prep to 3)

This presentation promotes an integrated approach to teaching and learning mathematics. Common underlying features that link mathematical concepts are based on an Awareness of Mathematical Pattern and Structure (AMPS). Spatial reasoning plays an integral role in developing mathematical concepts and processes, and the development of AMPs. Examples drawn from a series of research projects, the Pattern and Structure Mathematics Awareness Program, focused on 4 to 8 year olds, will demonstrate how this integrated approach aims to move mathematics teaching and learning beyond basic numeracy to discovering connected mathematical patterns and relationships. The presentation illustrates how the project assesses children’s mathematical development through a Pattern and Structure Assessment (PASA) interview, and exemplifies an innovative pedagogy, the Pattern and Structure Mathematics Awareness Program (PASMAP) that focuses on connected mathematical ideas.

Joanne Mulligan is Professor of Education in the Department of Educational Studies, Faculty of Human Sciences Macquarie University Sydney. Her background is in early childhood and primary teaching and professional development of teachers in mathematics education. She conducts a range of research projects focused on early number and spatial development including the development of children’s multiplicative reasoning, and early algebraic thinking. She is well known for her work in professional learning in schools and more recently the Top Drawer Teacher online resource for the Australian Curriculum: Mathematics. Over the past decade she has developed with colleagues Michael Mitchelmore the Pattern and Structure Mathematics Awareness Project with children aged 4 to 8 years and led several ARC Discovery projects. She is currently Project Leader of ‘Opening Real Science’ funded by the Australian Government, which is aimed at improving pre-service teacher education in mathematics and science.

Matt Sexton - Australian Catholic University, VIC
An Explosion Of Hope For The Teaching And Learning Of Our Future Mathematicians Primary

The Merriam-Webster dictionary defines hope as a verb that means "to want something to happen or be true, and to think that it could happen or be true", and a noun that means "a feeling that something good will happen or be true". In recent years, I have been inspired by the work of Jo Boaler (Stanford University) that is concerned with supporting teachers and students as successful mathematical workers and thinkers. In this presentation, I will share stories of my work (which did not necessarily start in a hopeful place!) where students, teachers, and events have shaped and inspired a new hope in me...a feeling of something good to happen for the teaching and learning of our future mathematicians.

Matt Sexton is a lecturer of mathematics education at Australian Catholic University (Melbourne). His background is in primary teaching and facilitating professional learning for classroom teachers, and providing support for mathematics curriculum leaders and education sector leaders. Prior to joining ACU in 2010, Matt held classroom teaching and leadership positions in primary schools, and he was a mathematics education consultant for Catholic Education Melbourne (CEM). Matt now lectures in preservice (early childhood and primary) and postgraduate courses at ACU, and he facilitates professional learning for classroom teachers and provides sector leadership support in schools and education systems across Australia. Matt’s professional interests include mathematics curriculum leadership in primary schools, effective mathematics pedagogies, and teacher professional learning.

Rob Vingerhoets - VIC
Not So Much A Bang But A Whisper Primary

There’s not going to be any explosion in maths teaching and learning until we get a few things right about kids and how they learn maths and how we should be viewing maths generally and maths lessons specifically. We, the teaching profession are doing an average job of engaging our kids in maths. That’s the not so good news. The better news is there’s no shortage of goodwill in dedicated teachers and even more good news is that you can change the way you look at and engage kids with maths. This keynote will explain/ elaborate on what we can do, as teachers, to make ourselves more confident and positive about maths and invariably make us more effective teachers of maths.

Rob Vingerhoets is an experienced and highly effective educator who has worked with teachers and students overseas and throughout Victoria and Australia. He was a primary school principal, curriculum coordinator and classroom teacher. He is an experienced teacher and author, having written a number of best-selling maths resource books and numerous articles.

Rob is a popular and engaging presenter of hands-on and engaging maths ideas and practices to teachers and students in Catholic, State and Independent schools over many years and he essentially believes and teaches by his credo that “maths doesn’t have to hurt”. While Rob is a highly regarded presenter he spends the greater proportion of his time involving students in lessons from kindergarten to year 10 and understands how to engage children in mathematics.

Rob works extensively throughout Melbourne and Victoria (in addition to his work in Tasmania, South Australia and Canberra) and believes that too often language prevents many students from showing their full potential in maths. His teaching practices focus on open-ended problems and activities and bring as many connections or links into a maths lesson as possible.
KEYNOTE SPEAKERS - THURSDAY

Dr Derek Hurrell - University of Notre Dame Australia, WA
Mathematics Classrooms - Why Are Some Fireworks And Others Just Sparklers?
Years 5 to 10

Why is it that all of the subjects maths seems to be the one that causes the most rolling of eyes and gnashing of teeth among not only students, but a good deal of the general population? How might we change the image of maths to be more Indiana Jones and less Hannibal Lecter? Some thoughts about the image that maths has, and what it might have.

Prior to going over to the dark side and joining the University of Notre Dame Australia, Derek had more than 25 years in classrooms and a few more years working as the Numeracy Consultant with the Association of Independent Schools of Western Australia.

His passion is in engaging students in the subject of mathematics and supporting the sensationally good work that teachers are doing in schools. He is published in the field of Mathematics Education (his favourite place to see his work is APMC because it’s aimed at teachers in the classroom) and received his PhD for his thesis entitled “Effectiveness of Teacher Professional Learning: Enhancing the Teaching of Fractions in Primary Schools.” His research interests are in the area of rational numbers, algebraic reasoning and what constitutes mathematical knowledge for teaching.

Russell Tytler - Deakin University, VIC
Models Of Inter-Disciplinary STEM Activities - How Can The Mathematics Be Made To Count? Secondary

The acronym STEM – Science, Technology, Engineering and Mathematics - is increasingly used in policy and curriculum discourse in Australia. STEM is becoming associated with interdisciplinary, often project-based, curriculum approaches. A key argument for this is the need to make the experience of the STEM subjects more engaging for students through activities that better represent the interdisciplinary nature of real world practices. This approach raises questions about how the teaching and learning of mathematics can best contribute to this engagement agenda, and how such interdisciplinary work can contribute to students’ thinking and working mathematically, beyond a simple procedural role. In this presentation I will draw on research carried out at Deakin on STEM innovation projects, experience also with the STEM Academy at the University of Sydney, and our evaluation of the Scientists and Mathematicians in Schools program, to look at different models of inter-disciplinary STEM and to explore productive roles for mathematics, and implications for mathematics teaching and learning.

Russell Tytler is Professor of Science Education at Deakin University. He has researched and written extensively on student learning and reasoning in science, and pedagogy and teacher and school change. He researches and writes on student engagement with science and mathematics, school-community partnerships, and STEM policy and practice. His current research interests include schools investigating STEM interdisciplinarity curriculum practices.

KEYNOTE SPEAKERS - FRIDAY

Marty Ross
Same Sermon, New Jokes
Years F to 12

So, it is remarkable what has become of mathematics education: curricula are of a whole new style, with textbooks to match; the array of technological wizardry is endless; familiar topics are treated in ways we could scarcely have imagined; astonishing new topics have sprung from nowhere; and on and on. It is all so different, the product of decades of effort. In this presentation we shall seek to explain how Australian mathematics education has become what it is, and we shall attempt to apportion due credit to all of those responsible.

Marty Ross is a mathematical bum. He resides with Burkard Polster at www.qedcat.com.

Dr Rhonda Faragher - University of Queensland, QLD
Learning Year Level Mathematics Curriculum When You’re Years Behind: Approaches For The Classroom Teacher Of Students With Mathematics Learning Difficulties
Years F to 12

The Australian Curriculum: Mathematics specifies the teaching of year level content to all the learners in the class, with adjustments as required. This can be a very challenging undertaking when some students in the class are many years behind their classmates. However, teachers have developed successful approaches for teaching in these contexts, with learners accomplishing important mathematics from their year level. In this presentation, I will consider three aspects: What might be possible, how this can be accomplished and why we should do this in the first place. Building from research undertaken in mathematics classrooms including students with significant intellectual disabilities, strategies will be presented for adjusting lesson content, managing the whole class, supporting individual learning needs and assessing learners.

Dr Rhonda Faragher has experience and expertise in mathematics education and disability studies. Her research interests have focussed on learners who find mathematics difficult, through disability or socio-economic disadvantage. Rhonda is a Board member of Down Syndrome Australia and a Trustee of Down syndrome International. She is a member of the International Association of Scientific Study for Intellectual and Developmental Disabilities (IASSIDD) and holds executive positions on the Quality of Life and Down Syndrome Special Interest Research Groups. She is an active member of research and professional mathematics education groups, including the Mathematics Education Research Group of Australasia (MERGA) and the Australian Association of Mathematics Teachers (AAMT) and a former President of AAMT. She has received a number of awards, including the 2016 Vice-Chancellor’s Medal for Staff Excellence, and the 2011 Mathematics Education Research Group of Australasia’s Research award for the development of the Down Syndrome Early Numeracy Interview. In 2009 she was awarded a Commonwealth of Australia Endeavour Executive Award to work in Singapore in the area of Down syndrome.
Dr Tracey Muir - University of Tasmania, TAS

Planning For And Capitalising On 'Teachable Moments' In The Primary Mathematics Classroom

Primary

As teachers, we are constantly looking for ways to provide students with opportunities to engage in purposeful and authentic mathematical experiences. On a daily basis we need to select teaching content and approaches that will motivate and challenge our students and enable teachable moments to occur. In this keynote we will look at examples of rich mathematical tasks that have the potential to create teachable moments. We will also look at what happens when those teachable moments occur, how teachers and students respond, and how you as a teacher can capitalise on these opportunities to engage, challenge and maximise learning for your own students.

Dr Tracey Muir is a Senior Lecturer in Mathematics Education at the University of Tasmania. Her research interests include effective teaching for numeracy, problem solving in mathematics, and parental involvement in mathematics education. Her PhD research investigated the characteristics of effective numeracy teaching and the ways in which reflection on practice contributes to this. Current research interests include teachers’ use of ICT in the teaching of mathematics, flipping the mathematics classroom and mathematical practices that promote reasoning and personalised learning. She has presented seminars and workshops at state, national and international conferences and is particularly passionate about working with teachers to enhance their classroom numeracy practices.

Janette Bobis is Professor of Mathematics Education and Pro Dean Research in the Faculty of Education and Social Work at The University of Sydney. She teaches mathematics education to pre-service primary teachers. Prior to this, Janette was a primary school teacher and fixed-term lecturer in primary and early childhood education programs. She has led a number of large research projects, including the Empowering Teachers of Mathematics (2011-2014) project, and the Middle Years Transition, Engagement and Achievement in Mathematics (MYTEAM) project (2008-2011). Janette's research and teaching expertise are well recognised, having received a Faculty Teaching Excellence Award in 2016, Thompson Research Fellowship in 2014, a national Practical Implications Award (2007) for her research on teacher education, a national Citation for Outstanding Contributions to Student Learning (2007) and a Vice Chancellor award for Outstanding Teaching in 2009.

Janette Bobis

Professor Janette Bobis - University of Sydney, NSW

Drawing, Gesturing And Talking: Using What Comes Natural To Young Learners Of Mathematics Early Years

Drawing, gesturing and talking are natural ways that young children use to communicate and represent their developing mathematical understandings. The interpretation of these representations is vital to teachers' abilities to scaffold student learning of mathematical ideas. Yet teachers are rarely taught how to notice, interpret and respond to such important signs of student understanding. This presentation explores research and practice surrounding young children's use of drawing, gesturing and talking to help them make sense of mathematical ideas and solve mathematical problems. It will introduce some practical strategies to support teachers notice and interpret their students' representations so that they might better support the development of their students' mathematical understandings.

Dr Jill Brown - Australian Catholic University, VIC

Digital Technologies Transforming Teaching And Learning Secondary

Digital technologies can transform the teaching and learning of secondary mathematics: but do they? Of particular interest are the affordances of the Technology-Rich Teaching and Learning Environment (TRTLE) allowing visual image generation by technology when problem solving. The transformational powers of the technology can produce technology-generated images to clarify and refine students' mental models of problem situations. Research suggests that, not all students take up the opportunities even though they have the technological and mathematical knowledge to do so, however, some do. This keynote presents classroom tasks, both real world (mathematical modelling or applications) and pure mathematics tasks and their implementation with the use of task-based, one-on-one assessment interviews with young children, strategies for developing persistence on cognitively demanding tasks, problem solving and investigations, manageable and meaningful assessment, and the professional growth of mathematics teachers. Doug enjoys working alongside teachers and students, as they seek to make mathematics relevant, challenging and enjoyable.

Doug Clarke is a Professor of Mathematics Education at the Australian Catholic University (Melbourne), where he directs the Mathematics Teaching and Learning Centre. Doug directed the Early Numeracy Research Project, exploring effective approaches to numeracy learning in the early years in 70 Victorian elementary schools from 1999-2002. Doug's professional interests include the use of task-based, one-on-one assessment interviews with young children, strategies for developing persistence on cognitively demanding tasks, problem solving and investigations, manageable and meaningful assessment, and the professional growth of mathematics teachers. Doug enjoys working alongside teachers and students, as they seek to make mathematics relevant, challenging and enjoyable.

Dr Jill Brown

Professor Doug Clarke - Australian Catholic University, VIC

Stories From The Classroom: The Practices Of Effective Teachers Primary

We all want our teaching to be effective as possible. A new document from the National Council of Teachers of Mathematics (USA) offers eight “strongly-recommended research-informed actions” for teachers and mathematics leaders. In this presentation, I will share stories from the classroom and insights from my research which bring these practices and actions to life.

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After having taught in secondary schools for over two decades, Dr Jill Brown now works as a Senior Lecturer in Mathematics Education at ACU (Melbourne), where she works with secondary, primary and early childhood future and current teachers of mathematics. Her interests include using digital technologies to transform teaching and learning, mathematical modelling, and mathematical thinking.

Dr Jill Brown - Australian Catholic University, VIC

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KEYNOTE SPEAKERS - FRIDAY

Yvonne Reilly, Jodie Parsons & Thao Huynh - Sunshine College, VIC

STEM - Mathematical Pedagogy That Supports Your STEM Program

Secondary

Since 2009, the Sunshine College mathematics program has been transformed from a teacher centred and textbook driven classroom to a future ready maths program which is well positioned to lead students to be fully prepared for a STEM future. The pedagogy is purposeful and fully differentiated and aligned with the Victorian F-10 curriculum. Since its inception student NAPLAN growth has exceeded the Victorian State Growth each year. In 2015, the Sunshine College maths team won two Victorian Education Excellence Awards i) Outstanding School Advancement Award ii) Lindsay Thompson Award for Excellence in Education. The success of the program has led them to be featured on Channel 7 and in newspapers in the UK and Australia. And has been featured at many conferences in Australia and around the world, most notably conferences in the US and New Zealand.

The college has been a regular feature at MAV since 2009. In 2015 they presented at the IMA International Conference on Barriers and Enablers to Learning Maths: Enhancing Learning and Teaching for All Learners, held at the University of Glasgow, Glasgow, Scotland.

Dr Gaye Williams - Deakin University, VIC

Inclining To Explore Mathematically And Pedagogically: Students And Teachers Possessing The Same Characteristics Primary & Secondary

Why are some students inclined to step into unfamiliar mathematical territory where others actively work to remain within what they know? Why are some teachers not willing to even try problem solving activity, others inclined to keep trying even when their problem solving approach is not working, and others inclined to change the strategies they try over time? Do teachers and students who are inclined to explore share the same personal characteristics? If so, what are they and can we build them. We will explore these ideas and Gaye will draw on her research to show how these characteristics are enacted by students and teachers.

Gaye Williams, a researcher and Senior Lecturer in mathematics education (Deakin University) and Honorary Senior Fellow (Graduate School of Education at the University of Melbourne) taught secondary mathematics (in boys, girls, and co-educational, Catholic, Independent, and Government, metropolitan and rural schools) for over 25 years. She has researched / provided professional learning from Early Childhood to Tertiary and participated in David Clarke’s international Learners’ Perspective Study. She has visited / researched in classrooms in eight countries. Her research examines opportunities for students to creatively develop mathematical insights, and the support of teachers working to achieve this. The deep learning and high level engagement resulting are consistent with the STEM Agenda. Gaye’s research focus has thus extended to STEM education.

Lunch

A number of food outlets at La Trobe University will be serving lunch to conference delegates. You will receive a lunch voucher with confirmation of your registration. This will entitle you to a “MAV Conference Package Lunch” at the following campus outlets:

- Pings Café Moat
- Café Spice
- Café Veloci
- Caffeine Café
- Fuel Juice
- Fusion Pizza
- Grain Express
- Mamak Rice & Noodle
- Supernatural La Trobe
- Vitality
- Writers Block

When filling in your registration form online you MUST select which outlet you want to get lunch from for each day you are attending. If nothing has been selected your default will be Pings Café Moat.

Union Building

- Thursday
  1. Hot Lunch Box - Rainbow steak OR Stir fry mixed vegetable with steamed rice
  2. Cold Lunch Box - Roast chicken and salad roll, vegetarian sushi, fruit
  PLUS Bottle of drink

- Friday
  1. Hot Lunch Box - Lemon chicken OR Stir fry mixed vegetable with steamed rice
  2. Cold Lunch Box - Teriyaki chicken and salad roll, vegetarian sushi, fruit
  PLUS Bottle of drink

Agora Square

- Café Spice
  Large serve of 2 curries and rice,
  PLUS 1 serve Indian sweet dessert (Gulab Jamun)
  Available - Gluten free, nut free, halal, vegan

- Café Veloci
  Main meal
  PLUS 1 piece of fresh fruit, cold drink, chocolate treat
  Available - Gluten free, vegetarian, vegan, dairy free, nut free

- Caffeine Café
  1 x Variety of gourmet baguette OR 1 x Gourmet wrap OR 1 x 3 Pack homemade Vietnamese rice paper rolls OR 1 x Brown rice salad on Thursday / 1 x Quinoa salad on Friday
  PLUS Regular drink, assorted fresh fruit OR melting moment (sweet treat)
  Available - Vegetarian, vegan, gluten free, dairy free, nut free, lactose free

- Fuel Juice
  1 x Large salad OR Felafel wrap
  PLUS Regular drink, piece of fresh fruit OR small fruit salad, small yoghurt
  Available - Gluten free, vegetarian

- Fusion Pizza
  2 slices of pizza & potato cake OR Hamburger OR Lasagne
  PLUS Soft drink, piece of fruit
ACCOMMODATION

MANTRA HOTEL, PRESTON
Located a short 10 minute drive from La Trobe University, this is a 4 star hotel. A shuttle bus will operate between Mantra and La Trobe University on the Thursday and Friday of the conference. The below prices do not include breakfast.

OPTION 1
STUDENT ROOMS
These rooms consist of 1 single bed 190cm long x 94cm wide and offer a work station with high speed internet, Foxtel, tea & coffee making facilities, small bathroom with shower over toilet and self-controlled air conditioning.

Student Room: $83.00 per Room/per Night

OPTION 2
BREAKFREE QUEEN OR TWIN
Featuring floor to ceiling glass, these rooms consist of either 2 single beds or 1 queen bed and offer a work station with high speed internet, Foxtel, tea & coffee making facilities, wet bathroom style en-suite and self-controlled air conditioning.

BreakFree Queen/Twin: $127.00 per Room/per Night

OPTION 3
1 BED MANHATTAN ROOM
 Simply stunning 1 Bed Manhattan offers 1 queen bed, self-contained kitchenette including stove top, microwave, fridge, lounge and dining. All rooms feature work station, high speed internet, Foxtel, self-controlled reverse cycle air conditioning/heating, minibar, LCD TV & in room safe.

1 Bed Manhattan Room: $193.00 per Room/per Night

OPTION 4
2 BED MANHATTAN ROOM
As per the 1 Bed Manhattan but with 2 queen Beds

2 Bed Manhattan Room: $248.00 per Room/per Night

LA TROBE UNIVERSITY

Student Rooms
Glenn and Menzies Colleges are located on campus at La Trobe University. These are student rooms used during the year so are not spacious. Please note also that there are a number of other patrons staying at the college at the same time so there may be some noise during your stay. These rooms consist of 1 single bed. Bathrooms are shared with 1 bathroom for every 4 rooms. You will need to bring your own toiletries and soap. The below price does not include breakfast.

Student Room: $50 Per Room/Per Night

All rooms are subject to availability. We have placed a limited hold on rooms so book early.
Session Summary

C17 3 to 8  Targeted Tasks For Taming Multiplicative Thinking - Dr Chris Hurst, Dr Derek Hurrell
C18 3 to 9  The Lost Logic Of Elementary Mathematics And The Haberdasher Who Kidnapped Kaizen - Jonathan Crabtree
C19 3 to 9  Are There Any Winners In High-stakes Testing? An Investigation Into The Impact Of Naplan Into The Teaching And Learning Of Mathematics - Linda Cranley, Dr Gregory Hine
C20 3 to 10  Intentionally Engaging 2.0 - Greg Carroll
C21 4 to 8  Understanding, Fluency, Problem Solving And Reasoning. How Do We Do It All? - Paul Tufet
C22 4 to 12  What Maths Do Your Students Really Need After They Leave School? - Trish Jelbart, Cathy Bushell, Nicole Merlich
C23 5 to 8  Differentiation Without Technology: Using Enrichment Problems For Stages 3 And 4 - Associate Professor Anne Prescott, Pauline Kohlhoff
C24 5 to 8  How To Teach Decimals Better - Michael O’Reilly, Norrian Rundle
C25 5 to 9  Algebraic Thinking Revealed In Responses To Fraction Tasks - Catherine Pearn, Dr Max Stephens
C26 5 to 9  Teacher Teams Transforming Mathematics - Scoresby Secondary College Experience - Leanne Wilson, Emma Morris
C27 5 to 9  Accessing Mathematical Content Through The Proficiency Strands - Lorraine Day
C28 6 to 8  Number And Algebra - A Bridge From Primary To Secondary School - Ian Bull
C29 6 to 8  Investigative Activities: Year 7 Australian Mathematics Curriculum - Romolo Cinillo
C30 7 to 8, VCAL  Numeracy Rescue - Dr Ian Lowe
C31 7 to 9  Developing An Integrated Inquiry Based Curriculum For Year 7 STEM (Science, Technology & Mathematics) - Elizabeth Lonergan
C32 7 to 12  A Pathway To VCE Algorithmics Units 3 & 4 (HESS) - Ivan Carlisle
C33 7 to 12  Using TI-Nspire’s Memory In An Efficient Way - Mehmet Aklu Altuñaldu
C34 7 to 12  Teaching Mathematics In The Digital Age - Philip Sakellardis
C35 7 to 12  Putting Mathematics Back Into STEM - Rodney Anderson
C36 7 to 12  Using Sliders Functionality In TI-Nspire For Graphical Exploration - Yew Fook Chan
C37 9 to 11  Incorporating STEM Using TI-Innovator™ - Neale Woods, Gary Bass
C38 9 to 12  Mathematical Problem Solving With A TI-Nspire CX CAS - Dr Wee Leng Ng
C39 10 to 12  Worthwhile CAS Calculator Use In This Year’s 2nd Methods Exam? - Kevin McMenamin
C40 11 to 12  Learning Without Understanding - Dr Pumadevi Sivasubramaniam
C41 12 to 10  How To Use The Notes Pages On The TI-Nspire CAS CX Calculator? - Craig Browne
C42 12 to 10  How Doesn’t Trumps CAS Calculators For Year 10-12 Mathematics - Bryn Humberstone, Sam Hannah
C44 11 to 12  ClassPad For Mathematical Methods - Charlie Watson
C45 11 to 12  ClassPad: CAS For Learning In Mathematics Units 1&2 - Ian Sheppard
C46 11 to 12  Linear Regression Analysis Using MS Excel: Simulation, Model Fitting, Diagnostics And Interpretation - Nazim Khan
C47 11 to 12  Further Mathematics Matrices Module Using The TI-Nspire - Russell Brown
C48 11 to 12, VCAL VCAL Responsible Gambling Victoria Units - Jamie Gray, Oliver Lovell
C49 12 to 12  2015 Specialist Mathematics Examinations - Allison McNamara, Dr Philip Swedish, Dean Lamson

2:20pm-3:20pm Session D (THURSDAY)

D1 EY to 12, VCAL Using Technology To Make Formative Assessment More Effective And Efficient - Karen McMullen
D2 K to 12  Two Days In Finnish Primary School - Trish Jelbart
D3 F to 6  reSolve: Maths By Inquiry For F-6 - Bruce Ferrington, Kristen Triplet
D4 F to 6  Early And Aspiring Primary Maths Leaders - Ben Briggs
D5 F to 6  Making The Most Of Maths Card Games - Dr Paul Swan, David Dustan
D6 F to 6  Once A Day-Two Ways - Shane Callthorp
D7 F to 6  Active  ePloration Of Understanding Within The Measurement Strand - Jan Cavanagh
D8 1 to 3  Cool Ways To Teach Place Value For Years 1 To 3 - Ian Howard
D9 1 to 8  Rich Mathematical Tasks Using Dragon And Cat Data Cards - Dr Nicola Petty
D10 2 to 8  Learning Fractions With Picture Puzzles - Doug Williams
D11 3 to 8  Making The Impossible Possible - Pam Hammond
D12 3 to 8  Captain Zero . . . Hero Or Villain? - Dr Derek Hurrell, Dr Chris Hurst
D13 3 to 8  Differentiation In One Easy Lesson (?) - Jacinta Blencowe

Session Summary

D14 3 to 8  Maths Card Games For Years 3-8 - A Strategy For Basic Number Facts - Richard Korboxky
D15 3 to 9  Are There Any Winners In High-stakes Testing? An Investigation Into The Impact Of Naplan Into The Teaching And Learning Of Mathematics - Linda Cranley, Dr Gregory Hine
D16 3 to 12  Student Performance In The AMC - Adjunct Professor Mike Clapper
D17 4 to VCAL  Maths And Sport - Dr Ian Lowe
D18 5 to 8  Exploring Problem Solving Strategies In Maths - Teachers’ Starting Point - Iqbal Hossain, Fahmida Hossain
D19 5 to 8  Formative Assessment For The Transition From Year 6 To Year 7 - Pauline Rogers, Jim Spillith
D20 5 to 8  Sundials And Other Solar Instruments - Tim Byrne
D21 5 to 9  Algebraic Thinking Revealed In Responses To Fraction Tasks - Catherine Pearn
D22 5 to 9  Strategies For Problem Solving - Susie Groves
D23 5 to 10  Teaching Statistics With Data Investigations And ‘Cool’ Tools - Dr Dung Tran, Dr Max Stephens
D24 5 to 10  My Students Don’t Know Their Tables! - Norrian Rundle, Michael O’Reilly
D25 5 to 12  Collaborative/Social Learning: Today’s Student Pathway - Alan Power
D26 5 to 12, Adult  Non-Intuitive Mathematics - Ken Ellis, Rick Swan
D27 7 to 9  Programming Mathematical Algorithms - Greg Browse
D28 7 to 10  Investing In Teachers: A System Plan - Catherine Smith, Paul Stenning
D29 7 to 10  Why We Should Lower The Average Marks Of Females In STEM - Felicity Furey, Jilian Kenny
D30 7 to 10  Differentiated Learning With Pearson Math’s 2nd Edition - Julian Lomb, Daniel Hernandez, Tim Carruthers
D31 7 to 10  What Happens When Challenging Tasks Are Used In Mixed Ability Middle School Mathematics Classrooms? - Karen Perkins
D32 7 to 10  (re)Solve) Mathematics By Inquiry In The Secondary Classroom - Michael Klinkert, Dr Steve Thornton
D33 7 to 10  MAV Year 10 Maths Camp - Helen Haralambous
D34 7 to 12  TI-Nspire Basics For Teachers With Limited Experience Of The Technology - Frank Moya
D35 7 to 12  Mathematica and Wolfram|Alpha, Coding And Functionality To Access Real-world Data - Ian Willson
D36 7 to 12  Examview 101: Build A Sustainable Assessment Environment - John Meng
D37 7 to 12  Problems Worth Exploring - Shane Dempsey, Peter Fox
D38 7 to 12  A Guide To Cambridge’s Online Resources Powered By HOTmaths - VJ Gunawardana
D39 7 to 12, VCAL  Making Flipped Learning Work For Your Class - Ben Dennis
D40 7 to 12, VCAL  Teaching Mathematics In The Light Of STEM - Karim Noura
D41 7 to 12, VCAL  Teaching Mathematics To Secondary Students Who Have Major Gaps In Their Mathematical Understanding - Leith Paulinovich
D42 8 to 12  Using Algorithms To Make Better Decisions - Kylie McColl, Michael Kirley
D43 9 to 11  Using Sliders Functionality In TI-Nspire For Graphical Exploration - Yew Fook Chan
D44 10 to 12  CANCELLED
D45 10 to 12  How Mathematical Modelling Can Help You Understand The World - Jan Brugbird
D46 10 to 12  There Is An App For That? - Jim Lowe
D47 10 to 12  Further Maths Examinations 1 & 2: Advantageous Use Of The CAS Calculator - Kevin McMenamin
D48 11 to 12  ClassPad For Further Mathematics - Charlie Watson
D49 11 to 12  How To Teach Specialist Maths, If You Must - Marty Ross
D50 11 to 12  Further Mathematics Matrices Module Using The TI-Nspire - Russell Brown
D51 11 to 12  Volumes Of Revolution Using TI-Nspire - Tim Grabovszky, Raymond Rozen
D52 12 to 12  ClassPad: CAS For Learning In Maths Methods Units 3&4 - Ian Sheppard

2:20pm-4:40pm Session D-E (THURSDAY)

D-E1 1 to 10  Dyscalculia And Low Numeracy, Diagnosis And Intervention - Ann Williams
D-E2 4 to 12  What Is Flipped Learning About And How Does Adobe Help? - Dr Tim Kitchen
D-E3 8 to 12  Maths Inside - Maths Engagement Through Rich Tasks - Dr Mary Coupland, Associate Professor Anne Prescott, Dr Marco Angelini
D-E4 10 to 12  Hexagonal Prism, 2^x, Numeration And Calculus - Anthony Harradine

2016 MAV Annual Conference
Session Summary

Session 1

G24 5 to 10  Formative Assessment For The Transition From Year 6 To Year 7 - Pauline Rogers, Jim Spittal
G25 5 to 8  Whadda We Hafta Do This For? - Peter Sanders
G26 5 to 9  Teacher Teams Transforming Mathematics - Scoresby Secondary College Experience - Leanne Wilson, Emma Morris
G27 5 to 9  SMART Tests, Smart Teaching, Smarter Students - Sara McKee, Dr Max Stephens
G28 5 to 10  Scaffolding Statistics Understanding In The Middle School - Professor Jane Watson
G29 5 to 10  My Students Don’t Know Their Tables! - Norrian Rundle, Michael O’Reilly
G30 5 to 12  Collaborative/Social Learning: Today’s Student Pathway - Alan Power
G31 6 to 10  Differentiation Versus Modification - How Do I Effectively Differentiate For All Learning Needs And Styles? - Elizabeth Lonergan
G32 7 to 10  Made By Maths At La Trobe - Dr Katherine Seaton
G33 7 to 9  Using Technology To Teach Geometric - Kim Shuyue Zhang, Su Yin Tee
G34 7 to 9  21st Century Problem Solvers - Rhiannon Lowrey
G35 7 to 10  Pythagoras - Anthony Harradine
G36 7 to 10  Pokies And Responsible Gambling - Dr Ian Lowe
G37 7 to 10  How Far Can A Differentiated Learning Program Go? - Jenny Sutton, Deborah Murrell
G38 7 to 10  Fostering Student Engagement In A Networked Classroom - Thomas Yeo
G39 7 to 12  Examview 101: Build A Sustainable Assessment Environment - John Merg
G40 7 to 11  Maths Activities For Students With Special Needs - Leigh Thompson, Gareth Jones
G41 7 to 12  Geometric Constructions Using TI-Nspire - Mehmet Ali Aturald
G42 7 to 12  Data - Making Mathematics Real - Peter Fox
G43 7 to 12  Teaching Mathematics In The Digital Age - Philip Sakellaridis
G44 7 to 12  Is A Famous Cambridge’s Online Resources Powered By HOTmaths - VJ Gunawardana
G45 10 to 11  Investigating A Mathematical Methods Unit 3 Application Task Using The TI-Nspire - Russell Brown
G46 10 to 12  Nspired Mathematics Classroom - Bozenna Graham
G47 10 to 12  Understanding Finance - The General And Further Mathematics Courses - Robert Verma
G48 11 to 12  Picturing Relationships In Calculus - Alastair Lupton
G49 11 to 12  ClassPad For Further Mathematics - Charlie Watson
G50 11 to 12  Linear Regression Analysis Using MS Excel: Simulation, Model Fitting, Diagnostics And Interpretation - Nazim Khan

11:00am-1:20pm Session G-H (FRIDAY)

G-H15 8 to 12  The Robots Are Coming - Mathematics Through LEGO Mindstorms Robotics - Mark Gleeson
G-H15 8 to 12  Getting Started With Lua And TI-Nspire: Create Your Own Powerful Documents For Learning - Stephen Arnold
G-H15 8 to 12  Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview - Jan Brugard

12:20pm-1:20pm Session H (Friday)

H1 8 to 12  EY to 12, VCAL: Using Technology To Make Formative Assessment More Effective And Efficient - Karen McMullen
H2 9 to 10  Developing Mathematics With Infants - Doug Williams
H3 10 to 11  reSolve: Maths By Inquiry For F-6 - Bruce Ferrington, Kristen Tripet
H4 10 to 11  Growing Your Mindset - Cassandra Lowry, Alanna Butcher
H5 10 to 11  Data Fun With Bioglyphs - Dr Leicha Bragg, Jessica Koch, Ashley Willis
H6 10 to 11  Breaking Down Barriers In The Teaching And Learning Of Mathematics - Laura Barker, Chris Greene, Rebecca Backman
H7 9 to 10  Teachers’ Emotional Supports To Motivate Learners In Classroom - Xin Zhao, Dr Max Stephens
H8 9 to 10  Financial Numeracy In The New Victorian F-10 Curriculum - Shane O’Connor
H9 9 to 10  Family Maths - Helen Haralambous
H10 9 to 10  Getting Bang For Your Buck; Teaching Concepts Not Procedures - Yonnee Reynolds, Jodie Parsons
H11 10 to 12  Cool Ways To Teach Place Value For Years 1 To 3 - Ian Howard
H12 10 to 10  Go Further With PAT Maths - Pauline Rogers
H13 3 to 5  Engaging Tools Activities And Games That Deepen Learning - Michael Bairstow
H14 3 to 5  Maths Card Games For Years 3-6 - A Strategy For Basic Number Facts - Richard Korbosky
H15 3 to 5  Geometry Through The Art Of Paper Folding - Averil Lee, Shorna McRae

2:20pm-3:20pm Session I (Friday)

I1 5 to 9  EY To 12, VCAL: Using Technology To Make Formative Assessment More Effective And Efficient - Karen McMullen
I2 6 to 9  Moving Maths - Elise Mackie, Ben Kelsa
I3 6 to 9  reSolve: Maths By Inquiry - The Project In Victoria - Nadia Walker
I4 6 to 9  Waging War On Worksheets - Bruce Ferrington, Kristyn Tripet
I5 6 to 9  Maths And Minecraft - David Shigrov
I6 6 to 10  Lighting The Fuse: Choose Maths One Year On - Brett Stephenson
I7 7 to 10  There Is An App For That! - Jim Lowe
I8 7 to 10  Further Maths Examinations 1 & 2: Advantageous Use Of The CAS Calculator - Kevin McMamen
I9 7 to 10  The Senior Mathematics Class Can Be Fun Too - Lorna McCloy
I10 7 to 10  Mathematics Subjects At The Distance Education Centre Victoria - Neale Woods, Georgia Goors, Bill Simmaling
I11 7 to 10  ClassPad For Mathematical Methods - Charlie Watson
I12 7 to 10  Using CAS To Teaching Sampling In Methods And Specialist - Greg Neal, Agathi Neal

2016 MAV Annual Conference
A1 Teaching Maths And YouTube
Burkard Polster - Monash University, VIC

Keynote: Years F to 12
In this presentation Burkard will talk about his experiences communicating mathematics as The Mathologer on YouTube and on using his own and other people's videos in his teaching.

A2 Word Questions
Dr Paul Swan - WA

Keynote: Years F to 12
I am often asked about how to improve the teaching of word questions (especially the multi-part variety) in mathematics. National testing typically involves asking a word question to check application of a mathematical concept. Check whether the issue is in the mathematics or words. If you strip out the words, can the students do the fundamental mathematics at the heart of the question? If they can perform the calculation or mathematics it is likely that the associated language of the question and/or the structure of the word question is causing the problem. Try using a NEWRIAN analysis to determine where the reading and interpreting of the problem is occurring. For an overview of this process see: http://www.curriculumsupport.education.nsw.gov.au/primary/mathematics/nurcery/newman/. Anne Newman developed five prompts to break down word questions in 1977. The first two prompts are: Read the question to me. If you don’t know a word leave it out. Tell me what the question is asking you to do. The responses to the first two questions will give you an indication where the problem may lie. To interpret a word question students will need a large vocabulary. see: http://www.belb.org.uk/Downloads/nm_mathematics_vocabulary.pdf. This is only the start. Students will need to use these words. A mathematics dictionary will help but simply looking words up in a dictionary like Maths Terms and Tables is not enough on its own.

A3 Let’s Count: Families And Educators Working Together To Ignite Children’s Maths Learning And Practical Implications For The First Years Of School
Associate Professor Ann Gervasoni - Monash University, VIC

Keynote: Early Years
Let’s Count is a new Australian program and a social justice response to the fact that educational outcomes for children living in disadvantaged communities is statistically lower than for those living in more advantaged circumstances. Let’s Count was designed to specifically support families to assist their young children learn mathematics and develop positive dispositions towards mathematics. This presentation outlines the Let’s Count Program, family and educator responses and insights about young children’s mathematics learning. For example, the Let’s Count research found that by the end of their preschool year, lots of children had already reached many of the mathematics outcomes described in Level 1 of the Australian Curriculum: Mathematics. The implications of Let’s Count for children’s transition to school, curriculum and teaching in the early years of school will be explored.

A4 Connecting Young Children’s Mathematics Learning
Professor Joanne Mulligan - Macquarie University, NSW

Keynote: Early Years (Prep to 3)
This presentation promotes an integrated approach to teaching and learning mathematics. Common underlying features that link mathematical concepts are based on an Awareness of Mathematical Pattern and Structure (AMPS). Spatial reasoning plays an integral role in developing mathematical concepts and processes, and the development of AMPS. Examples drawn from a series of research projects, the Pattern and Structure Mathematics Awareness Program, focused on 4 to 8 year olds, will demonstrate how this integrated approach aims to move mathematics teaching and learning beyond basic numeracy to discovering connected mathematical patterns and relationships. The presentation illustrates how the project assesses children’s mathematical development through a Pattern and Structure Assessment (PASA) interview, and exemplifies an innovative pedagogy, the Pattern and Structure Mathematics Awareness Program (PASMAP) that focuses on connected mathematical ideas.

A5 An Explosion Of Hope For The Teaching And Learning Of Our Future Mathematicians
Matt Sexton - Australian Catholic University, VIC

Keynote: Primary
The Merriam-Webster dictionary defines hope as a verb that means “to want something to happen or be true, and to think that it could happen or be true”, and a noun that means “a feeling that something good will happen or be true”. In recent years, I have been inspired by the work of Jo Boaler (Stanford University) that is concerned with supporting teachers and students as successful mathematical workers and thinkers. In this presentation, I will share stories of my work (which did not necessarily start in a hopeful place!) where students, teachers, and events have shaped and inspired a new hope in me…a feeling of something good to happen for the teaching and learning of our future mathematicians.

A6 Not So Much A Bang But A Whimper
Rob Vingerhoets - VIC

Keynote: Primary
There’s not going to be any explosion in maths teaching and learning until we get a few things right about kids and how they learn maths and how we should be viewing maths generally and maths lessons specifically. We, the teaching profession are doing an average job of engaging our kids in maths. That’s the not so good news. The better news is there’s no shortage of goodwill in dedicated teachers and even more good news is that you can change the way you look at and engage kids with maths. This keynote will explain/elaborate on what we can do, as teachers, to make ourselves more confident and positive about maths and invariably make us more effective teachers of maths.

A7 Mathematics Classrooms - Why Are Some Fireworks And Others Just Sparklers?
Dr Derek Hurrell - University of Notre Dame Australia, WA

Keynote: Secondary
Why is it that all the subjects maths seems to be the one that causes the most rolling of eyes and gnashing of teeth among not only students, but a good deal of the general population? How might we change the image of maths to be more Indiana Jones and less Hannibal Lecter? Some thoughts about the image that maths has, and what it might have.

A8 Models Of Inter-Disciplinary STEM Activities - How Can The Mathematics Be Made To Count?
Russell Tytler - Deakin University, VIC

Keynote: Secondary
The acronym STEM – Science, Technology, Engineering and Mathematics - is increasingly used in policy and curriculum discourse in Australia. STEM is becoming associated with interdisciplinary, often project-based, curriculum approaches. A key argument for this is the need to make the experience of the STEM subjects more engaging for students through activities that better represent the interdisciplinary nature of real world practices. This approach raises questions about how the teaching and learning of mathematics can best contribute to this engagement agenda, and how such interdisciplinary work can contribute to students' thinking and working mathematically, beyond a simple procedural role. In this presentation I will draw on research carried out at Deakin on STEM innovation projects, experience also with the STEM Academy at the University of Sydney, and our evaluation of the Scientists and Mathematicians in Schools program, to look at different models of inter-disciplinary STEM and to explore productive roles for mathematics, and implications for mathematics teaching and learning.

11:00am-12:00pm Session B (THURSDAY)

B1 Number In The Early Years
Greta Brewin - RMIT University, VIC

Alice Turner - RMIT University, VIC

Workshop: Years EY to 2
An introduction to developing flexible mathematical thinking for students in the early years with a focus on counting and part-part whole understanding. This session explores common misconceptions and explains practical classroom strategies to overcome these using techniques designed to engage students of varying learning styles. The ideas presented stem from the work of Professor Dianne Siemon of RMIT University.

Keywords: Number Repeated as II
B2  Eliminating Maths Anxiety Through Gamification
Brent Hughes - Sydney, NSW

Workshop  Years EY to 6

Commercial Presentation

Brent Hughes - ex-classroom teacher, current game designer. I hated that kids hated maths. I love maths! Now I work for a commercial company that is bringing children back to mathematics. The difference between us and what you've already seen has to be seen. Words don't do our company justice.

Notes: Bring something that can get you access to the internet!

Keywords: Games/Online Learning
Not repeated

B3  Making Maths300 Work For You
Doug Williams - Mathematics Centre, VIC

Workshop  Years K to 12

Maths300 is a professional development platform. We simply want to support continuing discussion about best practice mathematics education. Maths300 lessons are provided as fuel for those discussions. Do you have a story about how these lessons have contributed to changes in your teaching practice, or enhanced learning for your students? Come along with a tale to tell, or just to listen to others. But also come along to learn about structures - less and more formal - that have been used by others to take advantage of this professional learning purpose.

Keywords: Algebra/Geometry/Hands On/Number
Not repeated

B4  Thought-provoking Math
Martin Richards - Education Services Australia, VIC

Lecture  Years F to 6

Need ideas to help structure a maths inquiry? In this session we'll take concepts such as prime numbers, chance, place value and show you practical ways to develop deeper thinking in mathematics through an inquiry approach.

Our free online resources Thought-provoking math use a blend of digital resources and ‘hands-on’ activities. We’ll also look at ways to integrate mathematics and digital technologies. This will look at teaching ideas available for free on The Digital Technologies Hub https://www.digitaltechnologieshub.edu.au/.

Keywords: Games/Number/Online Learning/Technology
Not repeated

B5  Multiplicative Thinking: Groups Of, Arrays, Region and Area Models
Fatimah Sheriffdeen - RMIT University, VIC

Lecture  Years F to 6

My presentation will be based on the concept of multiplicative thinking drawn from the primary mathematics curriculum. It will explore the groups of idea, array, region and area models. It will consist of a theoretical explanation which will explain the highlighted concepts and practical activities which will allow participants to demonstrate their learning and clarify any misconceptions they may have. Also, my presentation will touch on concepts of additive thinking and draw parallels to multiplicative thinking so teachers may understand the interrelationship between the two. Participants will also be given the opportunity to question the presenter about the different strategies used to teach multiplicative thinking from early years through to upper primary years.

Keywords: Multiplicative Thinking/Number
Repeated as E7

B6  Breaking Down Barriers In The Teaching And Learning Of Mathematics
Laura Barker - St Mary’s Primary School, VIC
Chris Greene - St Mary’s Primary School, VIC
Rebecca Backman - St Mary’s Primary School, VIC

Workshop  Years F to 7

This presentation will focus on supporting low literacy students in accessing the mathematics in problem solving tasks. It will provide a practical structure that enables students to work through the content of a problem solving question in a systematic manner. It will look at the management of catering for different abilities in the one mathematical task. The presentation will also focus on building teaching capacity by developing a peer observation model, that cultivates a culture of collaborative learning and sharing of ideas.

Keywords: Innovative Models/Learning Needs
Repeated as H6

B7  Literacy Of Mathematics
Kathryn Palmer - Every Child Counts Numeracy Consultants, VIC

Workshop  Years F to 8

For many students, Mathematics is a foreign language, learnt almost entirely at school and is not spoken at home.

This session will support teachers to:
- Identify potential language difficulties students may experience with mathematical tasks
- Develop interactive, useful Numeracy Walls and their purpose
- Importance of making connections
- Access excellent resources to vocabulary continuums

Keywords: Innovative Models/Learning Needs/Literacy
Repeated as C9

B8  Teach Maths For Understanding
Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop  Years F to 10

To help students learn maths with understanding at their own level requires differentiation of classroom activities some of the time. Ian has produced a differentiated resource with thousands of links to class teaching, small group teaching, hands-on activities and ICT, all linked to the Victoria Curriculum. It is available for levels F to 10, and free to teachers in all schools that are MAV members. It has been locally adapted and used successfully by very many schools across the state. Come and share or learn more.

Keywords: Differentiation
Not repeated

B9  Mathletics - Take A Fresh Look: Integrating Mathletics Into The Classroom
Lauren Anderson - 3P Learning, NSW
Tom Beardsworth - 3P Learning, NSW

Computer Workshop  Years F to 10

Commercial Presentation

This session will provide you with an overview about how to successfully integrate Mathletics into the classroom. Looking at the ability to differentiate students as needed, as well as how to set curriculum topics and activities to enhance student understanding. We will also look at assessment and reporting with Mathletics. How it has changed and how to utilise this section to support your teaching. We will also take a look at the ebooks and problem solving resources, using the videos and interactives to enhance your explicit lessons.

Notes: Session One - Will be Primary Focus. Session Two - will be Secondary Focus.
Keywords: Assessment/Online Learning
Repeated as G12

B10  reSolve: Mathematics By Inquiry
Dr Steve Thornton - Australian Academy of Science, ACT
Kristen Tripet - Australian Academy of Science, ACT
Bruce Ferningtor - Australian Academy of Science, ACT
Michael Klinkert - Australian Academy of Science, ACT

Lecture  Years F to 10

Mathematics by Inquiry is an Australian Government funded project designed to promote inquiry approaches to mathematics from Foundation to Year 10. The approach adopted empowers students to reason mathematically, emphasising the key aspects of formulating complex problems and communicating and evaluating the solution. The project is producing exemplary materials for students and professional learning resources for teachers, informed by Australian and international best practice. In this session we will present the Mathematics by Inquiry Protocol, a framework used to inform the development of all materials in the project and to provide teachers with a robust theoretical and practical framework for teaching inquiry-oriented mathematics lessons. We will also demonstrate some of the draft resources being developed for students and teachers.

Keywords: Maths by Inquiry
Repeated as C10

B11  Family Maths
Helen Haralambous - The Mathematical Association of Victoria, VIC

Workshop  Years F to 10

Participants in this session will gain some tips for hosting a Family Maths Night at their school. Practical logistical tips, tried and trusted resources and ideas for running a successful event will be explored.

Keywords: Games/Innovative Models/Student Activities
Repeated as H9
B12 Lighting The Fuse: Choose Maths One Year On
Michael O'Connor - AMSI, VIC

Lecture Years F to 12
What are the elements that combine to produce sufficient spark in a school, classroom or individual for effective learning of mathematics? This presentation is a combination of theory, practical advice and reflection on observation of schools around the country about what works.

Keywords: Innovative Models/Leadership
Repeated as I6

B13 Getting Bang For Your Buck; Teaching Concepts Not Procedures
Yvonne Reilly - Sunshine College, VIC
Jodie Parsons - Sunshine College, VIC

Workshop Years F to 12
This session will examine the difference between teaching mathematical concepts and procedures and how we use this knowledge to maximise the time we have in the classroom. The session will also allow participants the opportunity to workshop some approaches to delivering conceptual understandings which are effective at generating student learning.

Notes: Bring a USB or QR READER.
Keywords: Innovative Models/Maths by Inquiry
Repeated as H10

B14 Formative Assessment Through Technology
Chris Daxecker - Tarneit P-9 College, VIC
John Eskander - Tarneit P-9 College, VIC

Workshop Years 2 to 10
Commercial Presentation
Would you like a quick snap shot of your classes' ability in a given topic? Is data sometimes arduous to analyse and provide little product for the time spent? Do you see yourself as a 21st century teacher integrating technology through every lesson? If your answer was 'yes', than do we have the PD for you. The idea of formative assessment does not simply stop in pre and post testing, but integrates itself throughout all aspects of instruction. As you know, there are different forms and levels on assessing students ability and how this takes place in your classroom will differ significantly. This PL arms you with some great strategies and programs to allow timely and purposeful feedback, working through technology to excite and engage the young people in your classroom.

Notes: Please bring your phone and/or iPad and/or computer ensuring internet access on one of the devices.
Keywords: Assessment/Technology
Repeated as G18

B15 Numeracy: Going Beyond Fluency
Karen McDaid - Western Sydney University, NSW

Workshop Years 3 to 6
It can be difficult to support student learning and achievement in NAPLAN without feeling like you are teaching to the test. This hands-on workshop will provide you with classroom ready ideas where all the activities are linked the numeracy demands of NAPLAN. All of the activities go beyond fluency, focus on problem solving have the proficiency embedded within them.

Keywords: Assessment/Problem Solving
Repeated as E17

B16 Teaching And Learning Multiplication Facts In A Meaningful Way
Justine Shelley - St Mary's Hampton, VIC
Natalie Bierman - St Mary's Hampton, VIC

Workshop Years 3 to 7
Commercial Presentation
We are primary school teachers, with a passion for bringing ‘times tables’ into greater focus, in a more meaningful way. Through our experiences, we discovered the need for a multiplication program that was more than ‘drill and practice’ and memorisation. We decided to bring together our ideas, in an on-line resource which promotes conceptual understanding, mental strategies, practise and ultimately fast recall of the 121 multiplication facts. Through this approach, understandings flow into other key areas, such as division, multiplicative thinking and fractions. The resource we’ve created is called Mfacts121.

Notes: Bring your device (laptop or tablet) please.
Keywords: Number
Repeated as F11

B17 Captain Zero . . . Hero Or Villain?
Dr Derek Hurrell - University of Notre Dame Australia, WA
Dr Chris Hurst - Curtin University, WA

Workshop Years 3 to 8
Our current research into children’s multiplicative thinking has shown that children have the capacity to think multiplicatively and that some aspects of multiplicative thinking are more thoroughly understood than others. We look at a data set obtained over three classes in the same year level and explores the considerable variation in responses to several key questions on a multiplicative thinking quiz and interview. The questions relate to the ‘times bigger’ notion in comparing numbers, the ability to use standard place value partitioning when operating, the ability to articulate what happens when numbers are multiplied and divided by powers of ten, and the role of zero.

Keywords: Multiplicative Thinking/Number
Repeated as D12

B18 The World’s Most Advanced Textbook Free In 2017
Megan Blanch - Mathspace
Ash Breen - Mathspace

Lecture Years 3 to 12
Commercial Presentation
The Mathspace E-Book is an Australian made digital Maths textbook with over a million users across the globe. It covers the Victorian, Australian and IB mathematics curriculum in great depth from year 3 through to year 12 Methods with rich features including thousands of worked example videos, interactive applets and step by step marking. Thanks to a generous sponsorship all attendees at this session will receive free access for all students in their school in 2017. You must register for this session to receive free access for your school.

Notes: Bring a laptop or tablet/Pad.
Keywords: Online Learning/Technology
Not repeated

B19 An Introduction To 3D Printing
Nat Bradshaw - Lowther Hall Anglican Grammar, VIC

Workshop Years 4 to 10
3D Printing is an emerging technology which is recently become both affordable and sustainable for use in schools. This workshop will introduce participants to Tinkercad, an online platform for the development of 3D models which can then be printed. The workshop will also discuss different activities which can be related to the maths classroom.

Notes: Please bring a laptop.
Keywords: Technology
Repeated as H19

B20 Differentiation Without Technology: Using Enrichment Problems For Stages 3 And 4
Associate Professor Anne Prescott - APSMO Inc, NSW
Pauline Kohlhoff - APSMO Inc, NSW

Workshop Years 5 to 8
In this hands-on interactive workshop we will explore how well-constructed problems can be used for teaching students who are at different stages of mathematical development. Using a variety of solution methods and related classroom activities based on questions from the APSMO Maths Games and Maths Olympiads, we will investigate the enhancement of differentiation in teaching mathematics. APSMO Inc. is a not-for-profit organisation.

Keywords: Differentiation/Hands On
Repeated as C23

B21 Some Favourite Problems - Do Them, Share Them, And Teach With Them
Giovanna Vardaro - Wesley College/Australian Maths Trust, VIC
Bruce Henry - Australian Maths Trust, VIC

Workshop Years 5 to 8
A number of favourite problems will be presented. Participants can try them, discuss solutions and learn how to use them in the classroom. Feel free to bring a problem of your own to share.

Keywords: Maths by Inquiry
Repeated as J19
B22  Algorithmic Thinking, Flow-charts And Coding In Transition Years  
Martin Buchholz - Rowville Secondary College, VIC
Lecture  Years 5 to 8
This session is aimed at upper primary to lower secondary year level teachers who have had no prior exposure to coding. Participants will be run through a selection of examples and activities addressing progression points VCMNA194, 221, 251, 254 and 282. Participants will be encouraged to code their own simple programs during the session using freely available web interfaces. Different options of representing algorithms will be discussed with regards to their suitability for given year levels; options include worded coding, flow-charts, pseudocode and language specific coding, i.e. Python. Participants will be provided with an electronic copy of the used example programs.
Notes: Bring your own laptop - fully charged.
Keywords: Coding
Repeated as H21

B23  Whadda We Hafta Do This For?  
Peter Sanders - La Trobe University, VIC
Workshop  Years 5 to 8
Whadda we hafta do this for? A common lament amongst middle years' students about algebra. Leap Frog, is a multi-layered cooperative problem solving activity that gets to the heart of algebraic thinking. On one level, a fun, engaging problem, involving exploration of pattern – undertaken successfully by the presenter with children as young as 8/9 - as the problem develops, deeper mathematical understandings emerge which lead to a rationale for algebraic generalisations – ideal for convincing lower secondary students that algebra is indeed worth doing! Warning – you will be deeply engaged in this session, solving Leap Frog!
Keywords: Algebra/Hands On
Repeated as G25

B24  A Teacher's Journey Through Multiplicative Thinking With Early Secondary Students  
Jim O'Neill - Kalamunda Senior High School, WA
Lorraine Day - University of Notre Dame Australia, WA
Workshop  Years 5 to 9
As part of the Reframing Mathematical Futures national project, four WA secondary schools embarked on a journey to help students to become better multiplicative thinkers, so that many areas of secondary mathematics would become more accessible to them. This involved targeted teaching within the normal maths classes. Hear about the journey of one of these teachers and try some of the tasks that were effectively practiced in the project.
Keywords: Innovative Models/Multiplicative Thinking
Not Repeated

B25  SMART Tests, Smart Teaching, Smarter Students  
Sara McKee - Springside P-9 College, VIC
Dr Max Stephens - The University of Melbourne, VIC
Workshop  Years 5 to 9
Springside P-9 College has been using SMART (Specific Mathematics Assessments that Reveal Thinking) assessments since 2014 in Years 5-9. SMART tests are online diagnostic assessments developed by The University of Melbourne to assist teachers in identifying student understanding and revealing student misconceptions. Over the past year, 10 teachers have regularly used the SMART tests to complement their in-class assessments. Most importantly, SMART tests have enabled our teachers to be more confident about planning and teaching mathematical content appropriate to their year level, to identify student misconceptions and how to move students forward in regular class settings.
Notes: Please bring a laptop.
Keywords: Assessment
Repeated as G27

B26  Not Quite The Illuminati  
Andrew Wrigley - Somerset College, QLD
Wally Brodar - Somerset College, QLD
Workshop  Years 5 to 12
A hands-on and interactive discussion of our experience in setting up and running a sustainable School Mathematical Society. What worked, what didn't and what is to come. All participants will receive a FREE gift!
Keywords: Innovative Models/Leadership
Repeated as H25

B27  Non-Intuitive Mathematics  
Ken Ellis - Retired Maths Consultant New York City, Trinity College, and Colac College, VIC
Rick Swan - Retired Maths Consultant New York City, Bendigo Senior Secondary College, VIC
Workshop  Years 5 to 12 & Adult
We will present a workshop involving hands-on activities that can be used with students from Year 5 to adult. The results are unexpected and the activities can easily be extended.
Notes: A standard calculator and smartphone would be helpful.
Keywords: Hands On/Technology
Repeated as D26

B28  Number And Algebra - A Bridge From Primary To Secondary School  
Ian Bull - St Kevin’s College, VIC
Workshop  Years 6 to 8
I will provide the details and content of a short program where students in Grade 6 at St Kevin’s College are taken on a path which connects the structure of the decimal number system, through scientific notation into the algebraic world of indices. Yes, students in Grade 6 are capable of working on quite a sophisticated level with algebra when they can make sense of the way that it is expressed. This program introduced my students to both number and algebra concepts required at Years 7 to 10, supported with a carefully constructed series of lessons in a logical sequence. All participants will receive full a set of the resources to trial at their own school.
Keywords: Algebra/Number
Repeated as C28

B29  Made By Maths At La Trobe  
Dr Katherine Seaton - La Trobe University, VIC
Workshop  Years 7 to 8
One of the free walks in the Made by Maths app of the MAV is a tour of La Trobe University. Join the author of the walk for a taste of the app, and enjoy some maths, architecture and sculpture.
Notes: Download the walk onto a device such as iPad, tablet or smartphone prior to the conference.
Keywords: Student Activities
Repeated as J32

B30  Algorithmic Thinking In Middle-Years Mathematics  
Greg Breese - Glen Waverley Secondary College, VIC
Workshop  Years 7 to 9
The Victorian Curriculum has included elements of algorithmic thinking within mathematics and digital technologies. This session will explore opportunities to integrate algorithmic thinking into the existing middle-years mathematics curriculum. This will be a hands-on session for teachers to practice expressing algorithms, sequencing actions and using branching and iteration in algorithms. There will be no programming component to this session.
Keywords: Algebra/Hands On
Not Repeated

B31  21st Century Problem Solvers  
Rhiannon Lowrey - Flinders Christian Community College, VIC
Workshop  Years 7 to 9
What does a problem solver look like in a 21st century classroom? Find out some strategies, new and tried and true to help look at what is a problem solver and what are educators doing to support thinkers.
Keywords: Maths by Inquiry/Problem Solving
Repeated as G34
Students learn best when they are motivated to learn by seeing the value and importance of the information presented. This presentation will exhibit our ASAP, a student approach to learning. It is a 7-10 Secondary Mathematics program, which we developed at our college and are now working with a number of schools to implement this exciting approach to learning mathematics. Throughout the session we will demonstrate how we motivate students to learn, creating an interactive atmosphere to allow for student voice, build connections through directed assessments, provide opportunities to apply knowledge to real world situations, challenge and engage students through effective feedback strategies and work through using data as a tool to improve key numeracy skills of our students. By the end of the session, each attendee will walk away with engaging activities, strategies that they can use immediately in their classroom.

Notes: Handouts will be supplied to all participants which will include ready to use materials for the Mathematics classroom.

Keywords: Innovative Models

B33 Pythagoras
Anthony Harradine - Potts-Baker Institute, Prince Alfred College, SA

Workshop Years 7 to 10
The theorem of Pythagoras is one of the staples. This workshop will engage you in a way of introducing it and extending it that you will most likely not have seen before. Students are presented with a very simple set of manipulatives (paper) and a simple task allows them to reveal so very nice results. Tried and proven, low entry point, as high an exit point as you desire. 

Notes: Please bring, paper, pencil, calculator of your choice of device.

Keywords: Geometry/Measurement

Repeated as G35

B34 How Far Can A Differentiated Learning Program Go?
Jenny Sutton - Lavalla Catholic College, VIC
Deborah Murrell - Lavalla Catholic College, VIC

Lecture Years 7 to 10
The idea of offering a differentiated learning program sounds commendable, but is it actually possible? In 2014 Lavalla Catholic College introduced the Maths Pathway learning model which allowed teachers to know the talents, skills, deficiencies and weaknesses in Mathematics of their students. However, the change to teaching practice required for teachers to deliver a totally differentiated Mathematics program was initially underestimated. Jenny Sutton and Deborah Murrell will discuss their experience of the change required of teachers and schools to implement a differentiated program such as Maths Pathway and share a vision of a community of Maths Pathway teachers who collaborate in creating differentiated rich lessons.

Keywords: Differentiation

Repeated as G37

B35 How Teachers Use Education Perfect Maths To Save Themselves Time And Hassle
Clare Feeney - Education Perfect, NSW

Lecture Years 7 to 10
Commercial Presentation
In this session, we’ll go through specific strategies Maths teachers use to save time and hassle in the classroom, using Education Perfect. We’ll look at how teachers can use the program to monitor student progress, provide quality feedback and support struggling students.

Keywords: Assessment

Repeated as I27

B36 Coding In The Mathematics Classroom
Shelley Cross - St Hilda's School, QLD

Workshop Years 7 to 10
Coding, Maths and the TI-Nspire CAS APP! Did you know you can write code on graphics calculators? This hands-on workshop will examine the “10 minutes of code” principle. We will use the TI-Nspire CAS APP on the iPad to code some very basic programs in mathematics. You will be able to take away ideas ready to implement and use in your classroom with students from Years 7 to 10; no previous coding experience of any kind is required. Please bring your iPad with the TI-Nspire CAS APP installed. We will have a small number of iPads with the TI-Nspire CAS APP installed which can be borrowed if you do not have your own.

Notes: Please bring your iPad with the TI-Nspire CAS APP installed.

Keywords: Coding

Repeated as H28

B37 Mathematical Modelling in STEM
Stephen Broderick - St Ursula’s College, QLD

Workshop Years 7 to 10
STEM education refers to solving problems that ‘draw on concepts and procedures from mathematics and science while incorporating the teamwork and design methodology of engineering and using appropriate technology.’ (NCTM 2013) Mathematical modelling provides a framework within most STEM activities whereby students can work together solving a common real-world problem. Students can unpack the problem, hypothesise, collect data, develop and test a modelling solution. In this session, mathematical modelling will be used to verify why the speed limit in a school zone is 40 km/hour. Environmental concerns such as the amount of plastic waste in the ocean and the successful conservation of tigers will also be investigated. Anemometers, cyclones, super storms and wind power will also be modelled. Sources of data include newspaper articles, the internet and the virtual world of the Islands.

Notes: These session uses TI-Nspire technology. Calculators will also be supplied. You may also bring your laptop.

Keywords: Maths by Inquiry/STEM

Not Repeated

B38 Mathematical Tasks To Expose Student Thinking
Vanessa Rule-Paddle - Pearson, VIC

Workshop Years 7 to 10
Commercial Presentation
Mathematical tasks which offer entry points to students of varying ability are tasks which allow teachers to differentiate in the one class. These kinds of tasks also allow for rich learning opportunities for students and teachers. Students are able to explore a scenario or mathematical concept using multiple methods while justifying their answers and reflecting on their learning, while teachers are able to gain insight into their students’ thinking. In this session you will have the opportunity to explore some of these tasks which allow these benefits and take them away to use with your students.

Keywords: Maths by Inquiry

Not Repeated

B39 The Joy Of Gambling
Marty Ross - VIC

Lecture Years 7 to 12
We have all heard the plaintive classroom cry: “when are we ever going to use this?” Well, at least in the case of probability there is an easy answer: we can use probability for the reason it was first discovered and investigated, in order to gamble. In this talk we’ll introduce and discuss three fundamental theorems of gambling. We’ll consider these theorems in relation to casinos and sports gambling, and the methods by which people are regularly fleeced.

Keywords: Probability & Statistics, Stirring the Possum

Not Repeated

B40 Reasoning - How To Teach It Reasonably Well
Dr Paul Brown - Curtin University, WA

Lecture Years 7 to 12
You will emerge from this session with some good resources for teaching mathematical reasoning, and perhaps with a clearer idea of what the curriculum intends by the word reasoning. Reasoning appears in the proficiency strand, but many teaching resources do not give it adequate attention and teachers may find it hard to assess. Paul has a considerable background as a secondary mathematics teacher, academic and author.

Keywords: Maths by Inquiry

Repeated as H35
B41 STEM With Graphing Calculators
Dr Pumadevi Sivasubramaniam - Teacher Education Institute, Malaysia
Nur Syamsia Mohd Haris - Teacher Education Institute, Malaysia
Syed Azman Syed Ismail - Teacher Education Institute, Malaysia

Workshop Years 7 to 12
This is a fun filled workshop using a graphing calculator, the TI-Nspire to explore decay of carbon-14 (C-14). It is so simple one will marvel at the simplicity of the procedure. The process involves application of basic probability and the initial activity will equip you to become a fossil scientist. You will be able to determine in a few simple steps when the organism given to you existed. The workshop will then develop you into a very able captain of the 2016 Titanic equipped with sonar devices (TI-Nspire and the Computer Based Ranger), and as the very able captain you may be able to take the Titanic to its destination by avoiding the fatal coral reef. There will be several more activities and demonstrations to highlight the application of Science, Technology, Engineering and Mathematics (STEM) that a teacher can try out in his or her classroom that would provide students the lens to look at science and mathematics as relevant and important to the real world.

Keywords: STEM
Repeated as E42

B42 Collaborative Tasks For Learning And Assessing Mathematics
Sabine Partington - Carey Baptist Grammar School, VIC
Dr Wendy Taylor - Bentleigh Secondary College, VIC
Brent Jewell - Carey Baptist Grammar, VIC

Workshop Years 7 to 12
Collaborative tasks and assessments have many benefits for student learning and play a key role in a balanced maths program, however they can also bring up some new challenges in the classroom. In this session we will unpack the benefits and also discuss how to address potential challenges. Sample tasks and projects from Years 7 to 12 will be run with the group and a bank of resources will be shared.

Keywords: Assessment
Repeated as I35

B43 Using Formative Assessment To Strengthen Student Understanding In Mathematics
Tobias Cooper - De La Salle Redland, NSW

Workshop Years 7 to 12
In this workshop participants will learn how Ti-Nspire software can be used to formatively assess student understanding in real time during a lesson. By identifying common misconceptions quickly, teachers can remedy faulty mathematical thinking that occurs. A variety of topics from the Australian curriculum will be explored.

Keywords: Assessment/Technology
Not Repeated

B44 Putting Mathematics Back Into STEM
Rodney Anderson - Moreton Bay College, QLD

Workshop Years 7 to 12
* An education in STEM also fosters a range of generic and quantitative skills and ways of thinking that enable individuals to see and grasp opportunities. These capabilities - including deep knowledge of a subject, creativity, problem solving, critical thinking and communication skills - are relevant to an increasingly wide range of occupations. They will be part of the foundation of nimble and adaptable workplaces of the future.* (Office of the Chief Scientist, Australia, 2014). In this workshop various STEM activities will be demonstrated and the collected data will be mathematically analysed using technology. In the time we have in the workshop various sensors will be utilised and they include the microphone, light probe, light battery, motion detector, laser and force sensor.

Notes: This session uses Vernier and Ti-Nspire Technology.

Keywords: STEM
Repeated as C36

B45 Mathematica - An Introduction To The Basics
Dr David Leigh-Lancaster - Victorian Curriculum Assessment Authority (VCAA), VIC
Linda Tilson - Mater Christi Beigrave, VIC

Computer Workshop Years 7 to 12 & VCAL
This workshop provides an introduction for those with little or no previous familiarity with Mathematica. It will cover basics for numerical, graphical and symbolic computation. Participants will work through a collection of examples and activities related to the Year 7-12 mathematics curriculum. Practical aspects of classroom implementation and some related resources will also be discussed and shared.

Notes: Bring a USB to store sample files.

Keywords: Technology/VCAL
Repeated as H36

B46 Wi Phi Sangaku
Ray Cross - QLD

Workshop Years 8 to 11
Awaken your students to the beauty of ancient and sacred Japanese wasan or mathematics and its tablets or Sangaku; many of which, surprisingly, relate to the golden ratio. Discover the impressive geometry of 17th Century Japan. This hands-on workshop investigates the structure and logic behind several Sangaku, valuable as further geometric incarnations of phi. Examples are most suitable as resource material for extension, project or assignments.

Notes: Some technology that can graph a function and its derivative is desirable. Content will be presented with ClassPad and Geogebra. ClassPads can be borrowed for the workshop.

Keywords: Geometry/Hands On/Technology
Not Repeated

B47 Teaching Mathematics In The Light Of STEM
Karim Noura - Bayside P-12 College, VIC

Workshop Years 8 to 12 & VCAL
In this presentation, teachers will share experiences of linking what to teach in the classroom to real life situations. We will address problem solving situations using various ideas and strategies on the light of science, technology, engineering and mathematics.

Keywords: Problem Solving/STEM/VCAL
Repeated as I37

B48 Numeracy For Life: Improving Numeracy Learning Outcomes
Cherie Pickering - Unley High School, SA

Lecture Years 9 to 11
Students in South Australia are required to achieve a C grade or better in one semester of Stage 1 Maths in Year 11. This is one of the compulsory components of the South Australian Certificate of Education (SACE). Failure to achieve a C grade or better means no SACE. Wind the clock back in time and consider: how many of our young people have failed Maths in the years preceding Year 11 and SACE … Years 8, 9 and 10? What can be done to change this growing phenomenon? At Unley High School, we’ve implemented personalised numeracy programs at Years 9 and 10, creating a pathway for those students most at risk of not achieving their SACE in Senior School.

This presentation will provide delegates with a snapshot of our program, including how we identify students at risk, our program content and how it is designed to enable students to develop the skills they need to pass the compulsory SACE Maths component … but more importantly to be able to work and function successfully in life beyond school.

Keywords: Innovative Models
Repeated as I39

B49 Exploring Functions With Desmos
William Seager - The Hutchins School, TAS

Lecture Years 9 to 12
The study of functions occupies a central position in the 9-12 Australian Curriculum. Desmos is an extremely powerful, free graphing calculator program available on a range of platforms and devices (computer, tablet, smartphone). It can be used in the classroom to explore functions in a wide variety of engaging and interactive ways. In this session, we will use Desmos to study functions across the 9-12 spectrum: in the discovery of Linear Relationships in Year 9, through an introduction to Linear Programming in Year 10, and in the discovery of differentiation, tangents and normals at pre-tertiary level.

Notes: Please bring laptop with internet connectivity or tablet with free Desmos application installed.

Keywords: Technology
Repeated as H40

B50 Picturing Relationships In Calculus
Alastair Lupton - Le Fevre High School, SA

Workshop Years 11 to 12
In Mathematical Methods, students should be “deducing the graph of the derivative function from the graph of a given function and deducing the graph of an anti-derivative function from the graph of a given function”. More than just an assessable skill, a mental picture of this powerful relationship also underpins an understanding much of the work done in Calculus. This workshop will look at ways that this mental picture can be helped to develop in students, supported a little technology and some well posed questions.

Notes: Some technology that can graph a function and its derivative is desirable. Content will be presented with ClassPad and Geogebra. ClassPads can be borrowed for the workshop.

Keywords: Algebra/Technology
Repeated as G48
B51  Assessment: Investigative Tasks And Sample Examinations For The ACARA Senior School Mathematics Courses
Romulo Cirillo - Mathematical Association of Western Australia, WA
Workshop  Years 11 to 12
Commercial Presentation
Sample investigative tasks suitable for school based assessment in General Mathematics, Mathematical Methods and Specialist Mathematics, will be provided to participants as indicative of what is available for purchase from the MAWA website. These are online resources suitable for the respective Year 11 and 12 courses, available in editable digital form upon purchase of a school site licence. Sample examinations for the respective Year 11 and 12 mathematics courses, with full marking keys specifying the mathematical behaviours (and relevant ACARA dot points) associated with the marks awarded will also be shared. These are also available in editable digital form upon purchase on a school site licence. Both resources include examples of appropriate use of CAS calculators and associated screen shots. While the session may be considered ‘commercial’ as it will be showcasing materials available for purchase, the focus of the session will be on designing quality assessment tasks for the respective courses.
Keywords: Assessment
Repeated as J44

B52  2015 Math Methods CAS Examinations
Allason McNamara - Mount Scopus Memorial College, VIC
Mary Papp - Caulfield Grammar School, VIC
Lecture  Years 12 to 12
Mary and Allason will do a similar session to the 2015 MAV Meet the Examiners Lecture for Mathematical Methods CAS as well as discuss common errors from previous years.
Notes: Bring the 2015 exams.
Keywords: Assessment
Not Repeated

11:00am-1:20pm Session B-C (THURSDAY)

B-C1  Having Fun And Learning Through Games
Peggy Ashton - La Trobe University, VIC
Jennifer Vincent - VIC
Workshop  Years F to 6
Invite students to share the joy of exploring mathematics. Banish the moans when maths is mentioned. Participants will have the opportunity to immerse themselves in a wide selection of games; discuss possible ways of adapting games to suit the needs of different groups of students; analyse games for the potential to foster mathematical understandings. A CD of all materials will be provided.
Keywords: Games/Hands On
Not Repeated

B-C2  Algorithmic Thinking in the Maths Classroom
Adjunct Professor Mike Clapper - Australian Mathematics Trust, VIC
Lecture  Years 3 to 10
The Australian Curriculum has now embraced Algorithmic Thinking as a part of the Digital Technologies strand. In Victoria this has also been included in Mathematics. This session explains how maths teachers can incorporate the teaching of Algorithmic Thinking into their teaching, as a highly-motivating way of getting students to engage with key mathematical ideas. It will explain the principles of algorithmic development and identify the most appropriate resources for maths teachers to engage with algorithmic thinking and coding in the maths classroom.
Keywords: Algorithmics/Coding
Not Repeated

B-C3  Having Some Fun With Numeracy And Maths
Dave Tout - ACER, VIC
Workshop  Years 4 to 10 & VCAL
Commercial Presentation
This hands-on workshop will enable participants to experience different games and activities suitable for classroom use with a range of numeracy and maths students. The activities focus on the development of core maths skills through the use of games, hands-on materials, utilising approaches such as whole group, small co-group work and individual activities, as well as on enjoyment and having fun with maths. The activities have mainly been developed for youth and adult students but are suitable for all students, especially middle years and VCAL. Some of the activities are available free, others are available in resources sold by the MAV.
Keywords: Games/Hands On/VCAL
Not Repeated

B-C4  Wolfram Technologies In Education And Research - Hands-on Workshop
Craig Bauling - Wolfram Research, USA
Computer Workshop  Years 4 to 12
Commercial Presentation
For over 25 years, Wolfram Research has been serving Educators and Researchers. Recently we have introduced many award winning technology innovations like Wolfram|Alpha Pro, Wolfram SystemModeler, Wolfram Programming Lab, and Natural Language computation. Topics of this hands-on workshop include:
◦ Natural Language Input (http://www.wolfram.com/broadcast/screencasts/free-form-input/)
◦ Market Leading Statistical Analysis Functionality
◦ 2D and 3D information visualization
◦ Creating interactive models that encourage student participation and learning
◦ Practical applications in Engineering, Chemistry, Physics, Finance, Biology, Economics and Mathematics
◦ On-demand Chemical, Biological, Economic, Finance and Social data - www.wolframalpha.com
◦ Mathematica for student coding - www.wolframprogramminglab.com
www.wolframalpha.com
Keywords: Technology
Not Repeated

B-C5  Rich Learning Lab - Create And Share Resources To Make Rich Learning More Impactful And Easy
Michaela Epstein - Maths Pathway, VIC
Joel Smith - Maths Pathway, VIC
Workshop  Years 5 to 10
Commercial Presentation
Rich Learning Tasks are pivotal to deepening students’ understanding and appreciation of maths, and allow for mathematical discourse amongst students. In this workshop, teachers work in groups to build capacity in design thinking and pedagogy for rich learning, as well as create and access a range of new rich learning tasks to use in maths.
Notes: Participants should bring a tablet or laptop.
Keywords: Maths by Inquiry/Problem Solving
Not Repeated

B-C6  TI STEM Playroom - Hands-on STEM Solutions For Your Classroom
Stephen Arnold - Texas Instruments Australia, VIC
Workshop  Years 5 to 12
Commercial Presentation
Want to create an affordable STEM-active classroom? Get your students started with coding? Explore and design solutions to practical problems? Make sense of the world through live real world data? Texas Instruments offers a range of affordable classroom-ready tools and resources designed to help students from the middle years to seniors get started with STEM, and then apply what they have learned. Try some 10 minutes of code activities. Design your own greenhouse, and within minutes monitor it from the Cloud. Build your own BLE ultrasonic motion detector, or use an accelerometer to land the lunar module. Access free online classroom resources for STEM. Come along and get a taste of what this could mean for your students!
Keywords: Coding/STEM/Technology
Not Repeated
12:20pm-1:20pm Session C (THURSDAY)

C1  MAV - Maths Talent Quest (MTQ)
June Penney - MAV Council/Student Activities Committee, VIC
Frances Sidari - MAV Council/Student Activities Committee/Lakeview Senior College, VIC
Workshop  Years EY to 12
The Maths Talent Quest (MTQ) continues to be an important component of the MAV’s Student Activities program. Running for over 30 years, it involves students engaging in personally chosen ‘real life’ math investigations. The categories include all Primary and Secondary year levels and investigations may be performed by individuals, groups or classes. Certificates and prizes are awarded at a presentation ceremony and some investigations are selected to represent Victoria in the Asia Pacific MTQ. Interested in the MTQ and how to incorporate it into your school/class program? Do you have a personal interest or have questions about running it at your school? Join us to discuss ideas, criteria and process and to view past investigation examples.
Keywords: Student Activities
Repeated as J2

C2  What’s The Story??
Ellen Corovic - The Mathematical Association of Victoria, VIC
Workshop  Years K to 6
Participants in this professional learning session will explore a range stories to engage learners. A fabulous collection of picture story books with ideas of how to develop mathematically rich and differentiated lessons will be the focus. In addition the power of developing ‘story shells’ as an additional tool to hook students in will be examined. This will be a hands-on and engaging session.
Keywords: Literacy
Repeated as G1

C3  Developing Powerful Multiplicative Strategies
Nadine Meredith - Catholic Education Office, NSW
Tammy Roosen - Catholic Education Office, NSW
Patrice Brady - Catholic Education Office, NSW
Geraldine Caleta - Catholic Education Office, NSW
Lecture  Years K to 6
Developing conceptual understanding of multiplication and division is complex. How do we move students from the known to the unknown in multiplication and division without rote drill and practice? In this session we will explore this question in practical ways as we explore a model for working with teachers in developing multiplication and division. We will look at the multiplicative structures of arrays, times-as-many and allocation and rate to improve students’ ability to think multiplicatively and develop proportional reasoning. This work was conducted in partnership with Dr Ann Downton and the Catholic Education Office, Diocese of Parramatta NSW.
Keywords: Multiplicative Thinking, Number
Repeated as G2

C4  21st Century Differentiated Instruction - Empowering Teachers In New Ways
Alexander Young - Ingenious Technological Enterprises, TAS
Lecture  Years K to 12
Commercial Presentation
This is a ‘world first’ means by which teachers monitor the quality of their teaching in assessment for learning. It is achieved by using their school’s photocopier, as a high speed scanner, which provides forensic feedback on each student’s learning needs. The concept of a ‘digital rubric’ for assessing both written and practical work, which enhances the clarity of teaching intent, as well as improving the transparency of feedback to students, will be introduced. This binary approach to teaching and learning lifts the outcomes of all students as it improves the quality of communication between the teacher and student.
Keywords: Assessment
Repeated as G3

C5  Self-selected Mathematics Learning
Doug Williams - Mathematics Centre, VIC
Workshop  Years K to 12
When you learn to read, people read to or with you. It’s critical; but it’s not enough. You must also have the opportunity to choose your own texts and read for yourself. That’s why we have libraries. When you learn to work like a mathematician, people need to show you or work with you. It’s critical but it’s not enough. You must also have the opportunity to choose your own problems and do mathematics for yourself. That’s why we have libraries of Mathematics Tasks, Picture Puzzles, Pub Menus and Menu Maths Packs. Explore these invitations to work like a mathematician and assess their value.
Keywords: Maths by Inquiry/Problem Solving
Repeated as E3

C6  Mathematical Reasoning: A Top Drawer Teacher Resource
Lilibee Spohn - University of Tasmania, TAS
Workshop  Years F to 6
Have you heard of Top Drawer Teachers? Are you a lead teacher in Numeracy or Mathematics? TEMPEST is a national project led by the University of Tasmania (with the Australian Mathematics and Science Partnership Program) focusing on the professional learning (PL) available to mathematics teachers. One of the aims of the project is to contribute to the creation of an online portal – Dimensions which will house quality PL. In this workshop we will explore the AAMT resource supporting the Australian Curriculum-Mathematics: Top Drawer Teachers for Reasoning F to 10. Reasoning is one of the four proficiencies in the national curriculum, which describes it as a capacity for logical thought and actions. We will unpack the TDT resource and navigate this website to show examples of key ideas related to reasoning. These are organised as Big Ideas, good teaching and assessment with activities on how to encourage reasoning with your students. We will discuss how to integrate these ideas into your mathematics teaching across most strands of the curriculum and investigate how this resource could be utilised by lead teachers supporting their colleagues.
Keywords: Innovative Models
Repeated as G10

C7  Using Challenging Mathematics Tasks And Pedagogies To Improve Achievement Of All Students
Professor Peter Sullivan - Monash University, VIC
Lecture  Years F to 6
This session will illustrate how using challenging tasks with appropriate pedagogies creates interesting and engaging learning environments. In particular, the ways that such approaches enhance achievement for all students will be illustrated.
Keywords: Maths by Inquiry
Not Repeated
C8 Lesson Study: An Inspiring And Meaningful Way To Learn From Each Other

Susie Groves - Deakin University, VIC
Felicity Ames - South Geelong Primary School, VIC

Lecture Years F to 6
Lesson Study is an inspiring and meaningful way to learn from each other. Used within Japanese schools for over 120 years, Lesson Study is an extremely successful approach to professional development – in particular the development of effective teaching practices. This approach to professional development involves teachers learning from each other, as well as from their students and other knowledgeable educators. Lesson Study within the mathematics classroom largely focuses on teaching mathematics through problem solving. This presentation will showcase crucial elements of Lesson Study and discuss its introduction and successful implementation in one Victorian primary school over the past three years.

Keywords: Innovative Models
Not Repeated

C9 Literacy Of Mathematics
Kathryn Palmer - Every Child Counts Numeracy Consultants, VIC

Workshop Years F to 8
"For many students, Mathematics is a foreign language, learnt almost entirely at school and is not spoken at home."

This session will support teachers to:
- Identify potential language difficulties students may experience with mathematical tasks
- Develop interactive/ useful Numeracy Wall and their purpose
- Importance of making connections
- Access excellent resources to vocabulary continuums

Keywords: Innovative Models/Learning Needs/Literacy
Repeated as B7

C10 reSolve: Mathematics By Inquiry
Dr Steve Thornton - Australian Academy of Science, ACT
Kristen Triplet - Australian Academy of Science, ACT
Bruce Ferrington - Australian Academy of Science, ACT
Michael Klinkert - Australian Academy of Science, ACT

Lecture Years F to 10
Mathematics by Inquiry is an Australian Government funded project designed to promote inquiry approaches to mathematics from Foundation to Year 10. The approach adopted empowers students to reason mathematically, emphasising the key aspects of formulating complex problems and communicating and evaluating the solution. The project is producing exemplary materials for students and professional learning resources for teachers, informed by Australian and international best practice. In this session we will present the Mathematics by Inquiry Protocol, a framework used to inform the development of all materials in the project and to provide teachers with a robust theoretical and practical framework for teaching inquiry-oriented mathematics lessons. We will also demonstrate some of the draft resources being developed for students and teachers.

Keywords: Maths by Inquiry
Repeated as B10

C11 Effective Use Of ICT And Digital Technologies In The Mathematics Classroom
Chantelle Polkinghorne - Ringwood North Primary School, VIC
Ben Allen - Ringwood North Primary School, VIC
Caitlin Chandler - Ringwood North Primary School, VIC

Workshop Years F to 12
Using ICT and digital technologies effectively in the classroom provides opportunities to enrich children's mathematical understandings. In this workshop, teachers from Ringwood North Primary School will share how user-friendly and easily accessible digital resources can be employed to support, enhance, and personalise student learning in maths from F-6 and beyond. This session promises to be engaging and you will leave with creative ideas that can be easily implemented into any classroom!

Notes: Bringing a fully charged iPad or laptop for this session will enhance your understanding of the tasks presented.

Keywords: Technology
Repeated as E12

C12 From Counting Charts To Informal Strategies
Ian Howard - Charles Sturt University, WA

Workshop Years 1 to 3
In this hands-on workshop you will learn how to use counting charts to reinforce essential place value ideas, as well as some simple investigations. The big ideas of partitioning and renaming will also be developed. These ideas then lead to learning basic mental computational strategies. We will also cover ways of practising and extending these mental strategies. You will also learn how to move on from the counting chart to using the empty number line as a tool for creating informal written strategies. The importance of modelling and discussion will be a feature of this workshop.

Keywords: Hands On/Number
Repeated as D11

C13 The Biggest Impediment To Student Growth. And How You Can Challenge It
Richard Wilson - Maths Pathway, VIC
Justin Mathys - Maths Pathway, VIC

Workshop Years 1 to 12
"Sarah just doesn't get maths", "Jayden will be lucky if he passes the next test", "I've got a really low class this year and there's no point trying to push them". What's wrong with these statements? How do they impact student learning? And how can you work with staff to powerfully reflect on their practice and create real improvements in maths as a result? In this session, we will be bringing theory and practice together so that you can walk away with concrete ideas for challenging impediments to student growth and making impactful change in your team. The session is aimed at coaches, leading teachers and others who support the ongoing professional development of their staff.

Keywords: Leadership
Repeated as J11

C14 Developing A Place Value App: A Teacher's Journey to Create "Zero Our Hero"
Dr Angela Rogers - St Monica's Primary School, VIC

Workshop Years 2 to 6
This session will describe the steps taken by a teacher wanting to develop a quality Place Value App for Year 2-6 students. The presentation will describe the sometimes frustrating search for an App developer willing to take on such a 'small scale' project. Practical tips and advice will be provided to assist teachers and educators who may be considering developing an App for their own students. The inspiration for the project and decisions relating to the technical and mathematical design of the App will also be discussed.

Keywords: Technology
Not Repeated

C15 Building On Student Strategy Knowledge Towards Efficient Recording For The Four Operations
Michael Bairstow - St Dominic’s Primary School, VIC
Danielle Carter - St Dominic’s Primary School, VIC

Lecture Years 2 to 6
As we move into the middle and senior years of primary school one of the challenges for teachers is trying to build on the informal mental strategies developed in junior grades to more efficient recorded strategies. Too often this comes at the expense of student understanding. The approach teachers will be shown in this session provides a great starting point for work on any of the four operations. It allows students to build on their prior knowledge, make connections between strategies and start moving to efficient recording while still focusing on understanding.

Keywords: Innovative Models
Not Repeated

C16 Making The Impossible Possible
Pam Hammond - Consultant, VIC

Workshop Years 3 to 6
How can we provide rich learning experiences for all the students in our classrooms? How can we plan so that the needs of all students are being considered? Sound impossible? This session will explore ways to make this possible! Participants will have the opportunity to try a range of open learning experiences, as well as create open activities that are suited to their own students. Examples will be taken from both Measurement and Number.

Keywords: Measurement/Number
Repeated as D11
C17  Targeted Tasks For Taming Multiplicative Thinking
Dr Chris Hurst - Curtin University, WA
Dr Derek Hurrell - University of Notre Dame Australia, WA
Workshop  Years 3 to 8
Identifying the level of children’s multiplicative thinking is a relatively straightforward task using a diagnostic interview and/or a written multiplicative thinking quiz. Our research has indicated the existence of some clear patterns in what children know and don’t know, their misconceptions, and their inability to articulate their multiplicative thinking. In this session, we present a range of tasks that we have found to be effective in developing aspects of multiplicative thinking, including the relationship between multiplication and division, the ‘times bigger’ notion, development and application of the array, and the use of materials to develop connections between place value, multiplicative thinking, and operating with numbers.
Keywords: Multiplicative Thinking/Number
Not Repeated

C18  The Lost Logic Of Elementary Mathematics And The Haberdasher Who Kidnapped Kaizen
Jonathan Crabtree - VIC
Lecture  Years 3 to 8
The mathematician, René Thom, wrote: “There is no case in the history of mathematics where the mistake of one man has thrown the entire field on the wrong track.” Thom was wrong. He hadn’t heard about Henry. Strangely, the maths lessons children need have been missing for centuries. If an ancient Chinese, or Indian mathematician, were alive today, she would say we don’t understand mathematics. The reason is simple. Our lessons are derived from Greek mathematics, which had neither zero, nor negative numbers. So discover how simple mathematics could have been, if it hadn’t been for Henry the haberdasher!
Keywords: Number
Repeated as G20

C19  Are There Any Winners In High-stakes Testing? An Investigation Into The Impact Of Naplan Into The Teaching And Learning Of Mathematics
Linda Cranley - The University of Notre Dame Australia, WA
Dr Gregory Nire - The University of Notre Dame Australia, WA
Lecture  Years 3 to 9
The testing of mathematical standards across Australia, through the annual implementation of National Assessment Program – Literacy and Numeracy (NAPLAN), invokes many questions about the potential that high-stakes testing has for academic reform in mathematics. This presentation will report to the impact of high-stakes testing on instructional pedagogy at one primary school, according to teachers, students and parents. The data for this investigation were collected from participants through semi-structured, qualitative interviews. This presentation will summarise the impact that NAPLAN has had on the attitudes and pedagogies of the teaching and learning of mathematics.
Keywords: Assessment
Repeated as D15

C20  Intentionally Engaging 2.0
Greg Carroll - AMSI, VIC
Lecture  Years 3 to 10
Not all engaging tasks are good tasks, but many are. In this hopefully engaging session, with lots of activities to be taken away, we will look at what distinguishes a good task from a time filler. Bring a sense of fun and a desire to enjoy your teaching career. This session has a similar theme to the 2015 presentation but covers all new activities.
Keywords: Hands On
Repeated as H16

C21  Understanding, Fluency, Problem Solving And Reasoning. How Do We Do It All?
Paul Tuchlan - Balcombe Grammar, VIC
Workshop  Years 4 to 8
We will explore how we use Maths Mastery and G.R.I.N. (getting ready for numeracy) in our school and still maintain our ideology of having a mathematically investigative school. By using these programs as well as Maths 300 and the like, our school has repeatedly made high growth and we would like to share our strategies with you. This session is ideal for those schools who: have just started or are new to using such programs; interested in these possibilities; or are having trouble managing any of these in your curriculum. While I have ticked that this is not a commercial presentation, I will be talking about two programs that I use at my school and if teachers are interested in them, they would have to purchase them from their creator – Monash University and ACER.
Notes: Delegates are asked to bring a typical day/week planner.
Keywords: Innovative Models/Maths by Inquiry
Not Repeated

C22  What Maths Do Your Students Really Need After They Leave School?
Trish Jelbart - Victoria University, VIC
Cathy Bushell - Mount St Joseph’s Girls’ College, VIC
Nicole Merlich - Victoria University, VIC
Lecture  Years 4 to 12
Many students are struggling with the Maths components of the TAFE and university courses. In some courses up to 50% of students cannot complete, fail or drop out because they do not have enough working Maths skills and knowledge to participate in the learning required despite having the potential. This session will look at the maths required for various TAFE courses and degrees and how we go about helping some of the students acquire the assumed maths skills and knowledge.
Keywords: Learning Needs
Not Repeated

C23  Differentiation Without Technology: Using Enrichment Problems For Stages 3 And 4
Associate Professor Anne Prescott - APSMO Inc, NSW
Pauline Kohlhoff - APSMO Inc, NSW
Workshop  Years 5 to 8
In this hands-on interactive workshop we will explore how well-constructed problems can be used for teaching students who are at different stages of mathematical development. Using a variety of solution methods and related classroom activities based on questions from the APSMO Maths Games and Maths Olympiads, we will investigate the enhancement of differentiation in teaching mathematics. APSMO Inc. is a not-for-profit organisation.
Keywords: Differentiation/Hands On
Repeated as B20

C24  How To Teach Decimals Better
Michael O'Reilly - Retired Teacher, VIC
Norriand Rundle - Retired Teacher, VIC
Workshop  Years 5 to 8
This presentation is based on the MY Numeracy Leader Decimals Module, plus much more. We will look at an easy to implement diagnostic test to identify common decimals misconceptions held by students. These misconceptions will be explored, as will a range of teaching strategies to address them. The concrete teaching aid, Linear Arithmetic Blocks (LABs), will be demonstrated. These can be constructed by participants and used to teach place value and decimals. Participants will receive copies of files and handouts, as well as detailed instructions for constructing the LABs.
Notes: Bring along a USB stick for take home resources.
Keywords: Number
Not Repeated

C25  Algebraic Thinking Revealed In Responses To Fraction Tasks
Catherine Pearn - The University of Melbourne, VIC
Dr Max Stephens - The University of Melbourne, VIC
Workshop  Years 5 to 9
The links between algebraic thinking and students’ experience of fractions in the middle years are not often explicitly taught. This presentation will focus on important links between fractional understanding and algebraic thinking. Based on extensive research using fractional tasks with students from Years 5 to 9 we will show how students move beyond arithmetic calculation to create chains of reasoning that are essentially algebraic. These methods are essentially multiplicative and can be generalised, in contrast to additive methods which work only with simple fractions. This presentation will introduce teachers to a range of question types and students’ successful solution strategies.
Keywords: Algebra/Fractions/Number
Repeated as D21
C26 Teacher Teams Transforming Mathematics - Scoresby Secondary College Experience
Leanne Wilson - Scoresby Secondary College, VIC
Emma Morris - Scoresby Secondary College, VIC

Workshop - Years 5 to 9
Leanne and Emma have designed and implemented a high quality teaching program that is inspiring student motivation, engagement and learning. The program is based on a guaranteed and viable curriculum that has been successfully differentiated to meet the needs of individuals and groups of students. Their classes are delivered as a team to Year 7 classes in purposeful spaces. The workshop will include some current theory, demonstration of planning documents and an opportunity for teachers to use resources that are available for free on the internet in many cases. There will be samples of pretesting pre-assessments, developing conceptual understanding through hands-on material, games and investigations and more. Guaranteed to be enjoyable and participants will gain knowledge of processes and resources that they will use in class the next lesson.

Keywords: Assessment/Differentiation
Repeated as G26

C27 Accessing Mathematical Content Through The Proficiency Strands
Lorraine Day - University of Notre Dame Australia, WA

Workshop - Years 5 to 9
This interactive workshop will investigate a range of tasks that use a problem solving approach for students to access deep understanding of mathematical concepts through reasoning and communication that will lead to greater fluency.

Keywords: Maths by Inquiry
Not Repeated

C28 Number And Algebra - A Bridge From Primary To Secondary School
Ian Bull - St Kevin's College, VIC

Lecture - Years 6 to 8
I will provide the details and content of a short program where students in Grade 6 at St Kevin's College are taken on a path which connects the structure of the decimal number system, through scientific notation into the algebraic world of indices. Yes, students in Grade 6 are capable of working on quite a sophisticated level with algebra when they can make sense of the way that it is expressed. This program introduced my students to both number and algebra concepts required at Years 7 to 10, supported with a carefully constructed series of lessons in a logical sequence. All participants will receive full a set of the resources to trial at their own school.

Keywords: Algebra/Number
Repeated as B28

C29 Investigative Activities: Year 7 Australian Mathematics Curriculum
Romolo Cirillo - Mathematical Association of Western Australia, WA

Workshop - Commercial Presentation - Years 6 to 8
Sample investigative activities suitable for use with students in Years 6-8, will be provided and discussed as indicative of what is available for purchase from the MAWA website. These are online resources available in editable digital form upon the purchase of a school site licence. Each activity comes with teacher notes indicating the dots points covered by the activity and the proficiencies that are addressed plus, solutions and a student handout of the activity. Participants will have opportunity to see the range of activities available within a bank of 120 activities covering all content areas of the Year 7 curriculum. While the session may be considered ‘commercial’ as it will be showcasing materials available for purchase, the focus of the session will be on delivery of the Year 7 content and proficiencies.

Keywords: Assessment/Games/Hands On/Maths by Inquiry
Repeated as I21

C30 Numeracy Rescue
Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop - Years 7 to 8 & VCAL
Secondary teachers are frequently very concerned about the levels of numeracy of some of their Year 7 students. Ian has developed a program that comprises diagnosis and remediation in the form of hands-on activities, games and digital reinforcement. Come to learn and share the activities of this package that can lift your numeracy and NAPLAN levels substantially.

Keywords: Games/Hands On/Number/VCAL
Not Repeated

C31 Developing An Integrated Inquiry Based Curriculum For Year 7 STEM (Science, Technology & Mathematics)
Elizabeth Lonergan - Beth Rivkah Ladies College, VIC

Lecture - Years 7 to 9
This presentation shares with delegates the why, what and how our College integrated a Science, Technology and Mathematics Program into one subject in Year 7. We will share insights from parents, teachers and students in reference to the program, the rationale, the curriculum, the achievements and the challenges. We will share how we have empowered our teachers and students to be critical reflective learners whilst achieving academic and social outcomes.

Keywords: STEM
Repeated as H26

C32 A Pathway To VCE Algorithmics Units 3 & 4 (HESS)
Ivan Carlisle - Melbourne Girls Grammar, VIC

Lecture - Years 7 to 12
VCE Algorithmics is an exciting new opportunity for students in their final years of school. At Melbourne Girls Grammar we have been working towards the goal of offering VCE Algorithmics in 2017. Our journey has included: the establishment of the A.I. Network - a coaching opportunity for students engaged in computer science competitions; the integration of algorithmic approaches into our mathematics program; and, the establishment of a Year 10 Algorithmics elective. In this presentation I will: outline the pathway we have developed; discuss beneficial competition resources; and, consider some opportunities regarding Edgy, Python, and Wolfram as VCE Algorithmics programming languages.

Keywords: Algorithmics
Repeated as H32

C33 Using Ti-Nspire’s Memory In An Efficient Way
Mehmet Akit Altunalu - Anity College, NSW

Lecture - Years 7 to 12
Ti-Nspire has a number of memory features which can be used by the students before and during the exam. In this session we’ll cover the different memory types such as documents, problems, pages, functions, programs and different types of variables.

Notes: Please bring your TI Calculator to this session.

Keywords: Technology
Not Repeated

C34 Teaching Mathematics In The Digital Age
Phillip Sakeilhardis - St Francis Xavier College

Lecture - Years 7 to 12
Teaching mathematics in a growing and evolving digital environment is becoming increasingly challenging. Having the right mix of traditional methodology paired with innovative teaching styles can for many seem like an impossible feat. Then we have to deliver the content in a way that caters for our young learners. This session will provide participants real examples of how the use of software like Microsoft OneNote can be used to teach day to day, allow assessment to be distributed, give students the opportunity to have a collaboration space with their teachers to ask questions. Delivering valuable insight in how to use CAS calculators can be used in effective ways where students can understand not only the access to menus but recall screen outputs.

Keywords: Technology
Repeated as G43

C35 Problems Worth Exploring
Shane Dempsey - Baimbridge College, VIC
Peter Fox - Texas Instruments, VIC

Workshop - Years 7 to 12
In this workshop we will explore infrequently asked questions; the type that provide multiple entry and exit points, exploration, span multiple mathematics disciplines and provide opportunities for extension. Whether your exploring hailstones, calculating factors, intersecting altitudes or measuring complex distances, there is bound to be something here that stimulates your dendrites and engages your students. Sorry, due to time restrictions, problems such as Fermat’s last theorem will not be solved in this workshop.

Notes: Bring your CAS calculator. There will be spares available.

Keywords: Technology
Repeated as D37
C36 Putting Mathematics Back Into STEM
Rodney Anderson - Moreton Bay College, QLD
Workshop Years 7 to 12
*An education in STEM also fosters a range of generic and quantitative skills and ways of thinking that enable individuals to see and grasp opportunities. These capabilities - including deep knowledge of a subject, creativity, problem solving, critical thinking and communication skills - are relevant to an increasingly wide range of occupations. They will be part of the foundation of adaptive and nimble workplaces of the future* (Office of the Chief Scientist, Australia, 2014). In this workshop various STEM activities will be demonstrated and the collected data will be mathematically analysed using technology. In the time we have in the workshop various sensors will be utilised and they include the microphone, light probe, motion detector, laser and force sensor. Notes: This session uses Vernier and TI-Nspire Technology. Keywords: STEM
Repeated as B44

C37 Using Sliders Functionality In Ti-Nspire For Graphical Exploration
Yew Fook Chan - School of the Arts, Singapore
Workshop Years 9 to 11
In this workshop, participants will be taught to plan, design and create learning activities for their students in exploring the graphical features of standard functions, e.g. linear, quadratic, exponential, logarithmic, trigonometric and reciprocal. Teachers will learn how to use the sliders functionality in TI-Nspire to effectively and efficiently help students make connections and understand the use of parameters in investigating the graphs of functions. Notes: Please bring along Ti-Nspire CX or CAS handheld or computer software with OS version 4.2. Keywords: Technology
Repeated as D43

C38 Incorporating STEM Using Ti-Innovator™
Neale Woods - Distance Education Centre Victoria, VIC
Gary Bass - Distance Education Centre Victoria, VIC
Workshop Years 9 to 12
In this workshop, participants will have a hands-on opportunity to trial the Ti-Innovator™ Hub, which is the latest development from Texas Instruments for incorporating Science, Technology, Mathematics and Science (STEM) into the classroom. Ti-Innovator™ allows students to develop projects across all these disciplines. The plug and play Hub supports the Ti-Nspire CX handheld and software (as well as the TI-84 Plus CE graphing calculator). Additional probes and sensors suitable for developing STEM projects will also be available at the workshop. Notes: Ti-Nspire CAS CX handhilds will be available for this session. Participants are encouraged to bring their own TI-Nspire CAS CX handheld or laptop with the Ti-Nspire CAS CX software. Ensure that you have the latest version of the operating system installed Keywords: STEM/Technology
Not Repeated

C39 Mathematical Problem Solving With A Ti-Nspire CX CAS
Dr Wei Leong Ng - Nanyang Technological University, Singapore
Workshop Years 9 to 12
Empowering students to make effective use of technological tools in the learning and application of mathematics is identified as an important objective of many school mathematics curricula. In this workshop, participants will engage in activities which explore uses of the Ti-Nspire CX CAS Learning Handheld, at different stages of the problem-solving process, in solving a collection of mathematical problems suitable for upper secondary students. Keywords: Problem Solving/Technology
Repeated as E44

C40 Worthwhile CAS Calculator Use In This Year’s 2nd Methods Exam?
Kevin McMenamin - The Peninsula School, VIC
Workshop Years 10 to 12
Routine and clever use of the CAS calculator in past Methods 2 examinations has shown it to be advantageous when time and effort is required to prove something correct. Generally, half of the multiple choice questions and many parts of the extended answer questions benefit from use of a differentiation calculator. This hands-on workshop will teach you how to use the calculator to see how helpful (or not) it was with this year’s questions. The most efficient methods will be presented and questions where the calculator should be avoided will be pointed out. The session is suitable for TI-Nspire and ClassPad users and the Casio ClassPad will be the featured CAS. Notes: Bring your own Casio calculator. Some ClassPads will be available for loan. Keywords: Technology
Repeated as J41

C41 Learning Without Understanding
Dr Pumadevi Sivasubramaniam - Teacher Education Institute, Malaysia
Lecture Years 10 to 12
This presentation describes how 100 trainee teachers who are fluent in performing addition, subtraction, multiplication and division of proper fractions performed in making multiple representations of these mathematical computations involving fractions. The representations were first the computation, then representing the computation using a diagram and finally creating a word problem based on the mathematical computation. The aim of this study was to determine if multiple representation of the mathematical computation and the ability to make connections between the representations is an indicator of conceptual understanding. The study also attempted through discussion to mediate thinking and conceptual understanding of multiplication and division of fractions. Keywords: Number
Not Repeated

C42 How To Use The Notes Pages On The Ti-Nspire CAS CX Calculator!
Craig Browne - St Joseph’s College, VIC
Workshop Years 10 to 12
This workshop will focus on how to use the Notes Page application on the TI-Nspire CX Calculator. If you use the calculator in Years 10, 11 or 12 and have not used it then this session may interest you. The use of notes pages can give an alternative in how to perform calculations in an efficient manner. Notes: Please bring your own calculator with operating system updated to version 4.2. Laptops with the TI-Nspire CAS CX Teacher software with operating system 4.2 will be even better. Keywords: Technology
Repeated as J42

C43 How Desmos Trumps CAS Calculators For Year 10-12 Mathematics
Bryn Humbersone - Caulfield Grammar School, VIC
Sam Hannah - Caulfield Grammar School, VIC
Lecture Years 10 to 12
A common initial objection to the online graphing calculator Desmos is that, unlike the CAS calculators, it cannot be used on exams. However, it has proved to be an invaluable tool in developing students' conceptual understanding and mathematical sophistication. Moreover, the ability to provide real time feedback to students through Classroom Activities makes formative assessment easier than ever. In this talk we will demonstrate how we have used Desmos in our Year 10-12 classes. No prior knowledge of Desmos is assumed. Notes: Participants are encouraged to bring along a tablet or laptop. Keywords: Technology
Not Repeated

C44 ClassPad For Mathematical Methods
Charlie Watson - The Tullion Centre, WA
Lecture Years 11 to 12
This option will focus on efficient test and exam use of ClassPad by Year 11 and 12 Methods students. Participants will develop an awareness of key ClassPad skills that MM students should develop for use when solving mathematical problems and applying mathematical processes. Useful eActivities, programs and functions will be demonstrated and shared. A reasonable working knowledge of ClassPad will be assumed in the session, but don’t let that put you off - just come along, sit back and see what’s possible. Notes: You may choose to bring your own ClassPad calculator to this session, as only a few loan models available. Keywords: Technology
Repeated as H46

C45 ClassPad: CAS For Learning In Maths Methods Units 1&2
Ian Sheppard - Geelong College, VIC
Lecture Years 11 to 12
From the extensive range of ClassPad activities written to the Australian Curriculum ATAR courses, the presenter will share reflections on his use, classroom practice and adaption of the resources to the VCE Maths Methods units 1&2 course. These activities are designed to be used as introductions to topics enabling students to explore and develop deeper conceptual understanding. That is the device is being used as tool to assist learning rather than an extra to be taught. The workshop part of the session will allow participants to work through some of the material. Notes: Please bring Casio ClassPad or emulator. Keywords: Technology
Not Repeated
C46 Linear Regression Analysis Using MS Excel: Simulation, Model Fitting, Diagnostics And Interpretation
Nasrin Khan - St Mary MacKillop College, ACT

Computer Workshop
MS Excel’s Data Analysis capabilities and Add-Ins will be used to demonstrate the concept of Least Squares Linear Regression Analysis. The idea of Least Squares Regression (LSR) will be demonstrated using simulations. LSR model will be fitted to a given data set and various Diagnostic Tests (including Residual Analysis) will be used to determine the adequacy of the model. We shall consider analysing two scenarios:
1) Both the dependent and independent variables are continuous;
2) The dependent variable is continuous but the independent variable is binary.
We will interpret the estimates of the slope parameter and its 95% confidence interval. We may also consider centering the independent variable around the mean/median to have a meaningful interpretation of the intercept parameter estimate.
Keywords: Technology
Repeated as G50

C47 Further Mathematics Matrices Module Using The TI-Nspire
Russell Brown - Educational Consultant, VIC

Workshop
In this hands-on session we will cover many aspects of the new Further Mathematics Matrices module using the TI-Nspire. It will include matrix terminology such as binary and permutation matrices, inverse matrices, solving simultaneous equations, dominance and communication matrices, recursion using matrices. Many hints and shortcuts will be demonstrated. A short analysis task will also be shown. TI-Nspire CAS calculators will be available if required.
Notes: Bring your TI-Nspire CAS handheld.
Keywords: Technology
Repeated as D50

C48 VCAL Responsible Gambling Victoria Units
Jamie Gray - Peter Lalor Vocational College, VIC
Oliver Lovell - Sunshine College, VIC

Workshop
This session will share three Units of VCAL numeracy focusing on the topic of Responsible Gambling. Developed in partnership between MAV, experienced VCAL numeracy teachers, and the Victorian Responsible Gambling Foundation, the engaging, hands-on activities/lesson plans shared in this session have been trialled in numerous VCAL numeracy classes around the State. Designed with the challenges of differentiation in the diverse VCAL classroom, and the large number of out of field teachers taking VCAL numeracy classes in mind, this session will be of high value to all those aiming to support the mathematical development of VCAL students.
Keywords: VCAL
Repeated as J45

C49 2015 Specialist Mathematics Examinations
Allison McNamara - Mount Scopus Memorial College, VIC
Dr Philip Swedish - King David School, VIC
Dean Lamson - Kardinya International College, VIC

Lecture
Allison, Philip and Dean will discuss common student errors in the 2015 Specialist Mathematics examinations. An analysis of the Multiple Choice section will be given; by-hand skills will be discussed and different approaches to answering the Extended Answer questions will be outlined.
Notes: Bring the 2105 Examinations.
Keywords: Assessment
Not Repeated

2:20pm-3:20pm Session D (THURSDAY)

D1 Using Technology To Make Formative Assessment More Effective And Efficient
Karen McMullen - Kilmore College, VIC

Workshop
Tired of spending hours marking assessment tasks and then having students not even look at the meaningful feedback you gave them? This session focuses on how technology can be used to decrease your marking time and to increase student learning. We will look at software such as Google Forms, Flubaroo, Screencast O Matic, Kahoot and Socrative.
Notes: Bring a laptop or iPad.
Keywords: Assessment/Technology/VCAL
Repeated as H1

D2 Two Days In Finnish Primary School
Trish Jebert - Victoria University, VIC

Lecture
International testing often places Finland at the top of the scales and has done for many years, whereas Australia is showing a decline. This session will present what goes on in a typical Finnish primary school over the course of 2 days, with a focus on mathematics and within the context of broader discussions about similarities and differences to Australian primary school education. The particular school in focus also has two classes for refugee and migrant students to learn Finnish before being placed in mainstream classes, indicating that this school caters for diversity.
Keywords: Innovative Models
Not Repeated

D3 reSolve: Maths By Inquiry For F-6
Bruce Ferrington - Australian Academy of Science, ACT
Kristen Tripet - Australian Academy of Science, ACT

Workshop
The reSolve: Maths by Inquiry is an exciting new project co-sponsored by the AAMT and the Australian Academy of Science, producing lessons and resources for teachers F-10. This workshop, presented by two of the resource writers, will highlight many hands-on and engaging activities that illustrate the philosophy and pedagogy behind bringing inquiry into the maths classroom. The workshop will focus on the three elements of the resolve protocol – to be purposeful; to be accessible yet challenging; and to promote a supportive knowledge-building community.
Notes: Please bring a spirit of inquiry with you.
Keywords: Maths by Inquiry
Repeated as H3

D4 Early And Aspiring Primary Maths Leaders
Jen Briggs - Derriemut Primary School, VIC

Lecture
Are you a new or aspiring leader of primary mathematics and need some direction on where to start? This session will explore ways of introducing a whole school approach to mathematics, building an agreed and viable curriculum, and developing teacher capacity and pedagogical content knowledge. Resources used at Derriemut Primary School will be available and participants are welcome to sign up to an email distribution list to form a small early leaders network for ongoing support and collaboration.
Keywords: Leadership
Not Repeated

D5 Making The Most Of Maths Card Games
Dr Paul Swan - Western Australia
David Dustan - Western Australia

Workshop
In this session participants will play a series of card games. These games will follow a similar routine, so once you have taught the rules to one, slightly different versions of the same game may be used to differentiate the level of difficulty or the topic. The mathematics behind the games will be linked to the Australian Curriculum. By the end of the session participants will be designing their own games, based on some general routines.
Notes: Please bring scissors as we will be cutting some card.
Keywords: Games
Not Repeated
D6  Once A Day-Two Ways
Shane Calthorpe - St Catherine’s School, VIC

Lecture
Years F to 6

A two prong presentation, focusing on the research into problem solving and how this research can best be applied to a classroom learning situations. Follow one classroom teachers’ journey through the research, development, trials and tribulations of implementing a classroom program designed to improve students’ attitude to mathematical problem solving and their ability to solve challenging problems. The audience will share in relevant research into problem solving and how this applies to the modern day learner. They will be walked through a pilot project delivered across multiple schools and see how the lessons learnt from ‘Once a Day-Two Ways’ can be applied to their classrooms.

Keywords: Innovative Models
Repeated as J5

D7  Active e’plosion Of Understanding Within The Measurement Strand
Jan Cavanagh - Queensland University of Technology, QLD

Workshop
Years F to 8

Using the Measurement Mat with students gives motivation and understanding through physical involvement. This effective engagement of students encourages explosive outcomes for measurement understandings. The resulting student-constructed models illustrate how well they understand and can use concepts of one, two and three dimensions (Length, Area and Volume). This is YuM Deadly Maths pedagogy which involves Body, Hand and Mind to construct the ideas and concepts necessary to build measurement understanding.

Keywords: Hands On/Measurement
Not Repeated

D8  Cool Ways To Teach Place Value For Years 1 To 3
Ian Howard - Charles Sturt University, VIC

Workshop
Years 1 to 3

In this hands-on workshop you’ll learn why place value is so vital and how you can ensure that your students develop the basic concepts. You’ll learn about the five basic properties of our number system. A feature of the workshop will be the use of simple materials and games that are designed to help children master the big ideas of place value. They’ll also develop the skills to become a wizard at mental computation. If you're looking for some new engaging ideas and approaches then this workshop is for you.

Keywords: Games/Hands On/Number
Repeated as H11

D9  Rich Mathematical Tasks Using Dragon And Cat Data Cards
Dr Nicola Petty - Statistics Learning Centre, New Zealand

Workshop
Years 1 to 8

Commercial Presentation

Rich tasks enable students at all levels to engage in mathematical and statistical thinking. StatsLC is developing a range of data cards and resources involving dragons, cats and more. In this fun, hands-on workshop we will use StatsLC’s Dragonistics data cards and Cat data cards in a number of statistical and mathematical tasks. Data cards can also be used in various games and activities developing skills in ordering, sorting and numeracy. The Dragon and Cat data cards are an exciting and inexpensive new product developed by StatsLC for use in classrooms from Year 1 up to Year 11.

Keywords: Probability & Statistics/Technology
Repeated as I9

D10  Learning Fractions With Picture Puzzles
Doug Williams - Mathematics Centre, VIC

Workshop
Years 2 to 8

This session offers a differentiated, multiple intelligence approach involving seeing, touching, saying and recording fractions in natural language which precedes and thereby strengthens fluency with their symbolic form. Cuisenaire Rods will be used because they are readily available and bridge to graph paper drawing. Picture Puzzle challenges which drive the workshop will be accessed through the web so bring your own web-connected computing device - smart phone through to laptop, it doesn’t matter which - to use with a partner. In combination these tools will teach us to ‘seek the whole’ when attempting to solve any symbol or word based fraction exercise.

Keywords: Fractions
Not Repeated

D11  Making The Impossible Possible
Pam Hammond - Consultant, VIC

Workshop
Years 3 to 6

How can we provide rich learning experiences for all the students in our classrooms? How can we plan so that the needs of all students are being considered? Sound impossible? This session will explore ways to make this possible! Participants will have the opportunity to try a range of open learning experiences, as well as create open activities that are suited to their own students. Examples will be taken from both Measurement and Number.

Keywords: Measurement/Number
Repeated as C16

D12  Captain Zero . . . Hero Or Villain?
Dr Derek Hurrell - University of Notre Dame Australia, WA
Dr Chris Hurst - Curtin University, WA

Workshop
Years 3 to 8

Our current research into children's multiplicative thinking has shown that children have the capacity to think multiplicatively and that some aspects of multiplicative thinking are more thoroughly understood than others. We look at a data set obtained over three classes in the same year level and explores the considerable variation in responses to several key questions on a multiplicative thinking quiz and interview. The questions relate to the ‘times bigger’ notion in comparing numbers, the ability to use standard place value partitioning when operating, the ability to articulate what happens when numbers are multiplied and divided by powers of ten, and the role of zero.

Keywords: Multiplicative Thinking/Number
Repeated as B17

D13  Differentiation In One Easy Lesson (!)
Jacinta Blencowe - AMSI, VIC

Lecture
Years 3 to 8

We all know that there can be a wide range of abilities and attitudes towards maths in a single class. How do we cater to all these abilities in student learning? Differentiation is one answer. But what is differentiation, why does it work and most importantly, how can I do it in my classroom? Come and find out about differentiation; from the research base to classroom practice. And leave with some practical ideas and formats to try in your own classroom.

Keywords: Differentiation
Repeated as I12

D14  Maths Card Games For Years 3-8 - A Strategy For Basic Number Facts
Richard Korobosky - Dualah Pty Ltd, WA

Workshop
Years 3 to 8

Commercial Presentation

Get students excited to learn, think and communicate mathematically by playing maths cards games: Times Table, Tenth Game, Hundredth Game, Fraction Games and the Relato Game which links fractions, decimals and percentage. The maths cards are enjoyable, challenging and adaptable to different student ability levels. See how you can get students to practice basic facts using a different strategy, focus on mathematical language, see the same concept represented in different ways and develop student’s flexible mathematics thinking. This session is for any teacher who has students who need a different strategy to practice their basic facts in a range of mathematics ideas.

Keywords: Games
Repeated as H14

D15  Are There Any Winners In High-stakes Testing? An Investigation Into The Impact Of Naplan Into The Teaching And Learning Of Mathematics
Linda Cranley - The University of Notre Dame Australia, WA
Dr Gregory Hine - The University of Notre Dame Australia, WA

Lecture
Years 3 to 9

The testing of mathematical standards across Australia, through the annual implementation of National Assessment Program – Literacy and Numeracy (NAPLAN), invokes many questions about the potential that high-stakes testing has for academic reform in mathematics. This presentation will report on the impact of high-stakes testing on instructional pedagogy at one primary school, according to teachers, students and parents. The data for this investigation were collected from participants through semi-structured, qualitative interviews. This presentation will summarise the impact that NAPLAN has had on the attitudes and pedagogies of the teaching and learning of mathematics.

Keywords: Assessment
Repeated as C19
**D16  Student Performance In The AMC**

**Lecture**

Over the last few years, the Australian Mathematics Trust has developed a sophisticated calibration mechanism for its AMC competition in order to ensure the appropriate level of accessibility and challenge in the competition. This has involved analysing the performance of many years of past competition questions which has revealed some fascinating insights into the questions that students can and can’t do. This presentation will provide teachers with a few surprise results from this analysis and some strategies for improving problem-solving performance.

**Keywords:** Problem Solving/Student Activities

**D17  Maths And Sport**

**Workshop**

Dr Ian Lowe - The Mathematical Association of Victoria

MAV has produced two digital resources the support the National Sports Museum: a pdf file with many links to resources, called “Pick your Sports”, and an app. Both support visits to the NSM, located at the MCG. However “Pick your Sports” is freely available from <http://nsm.org.au> (School excursions > Learning resources > Mathematics) will be explored participants in this session, led by its author. It is useful for anyone from Years 4 to VCAL who wants to use students’ interest in sports to stimulate an interest in maths, and show that maths is everywhere.

**Keywords:** Technology/VCAL

**D18  Exploring Problem Solving Strategies In Maths - Teachers’ Starting Point**

Iqbal Hossain - The Grange P-12 College, VIC

Faheen Hossain - Scholarship Assessment Training (SAT), VIC

**Computer Workshop**

Years 5 to 8

Without direction, the majority of students in upper primary and lower secondary students will fall back on ‘trial and error’. To become an efficient problem solver, we must explore the different strategies for problem solving. This session will cover in detail strategies to help develop good problem solving skills, habits. Also, to provide teachers and their students. We will explore these opportunities to develop their problem solving skills, a wide range of valuable resources and web references will be supplied.

**Keywords:** Maths by Inquiry/Problem Solving

**D19  Formative Assessment For The Transition From Year 6 To Year 7**

Pauline Rogers - ACER, VIC

Jim Spill - ACER, VIC

**Lecture**

Years 5 to 8

The first step in planning a lesson sequence is to know what students can or cannot do. Year 7 students are mostly new to a school and come from a variety of Year 6 feeder schools. The presentation will describe what we learned from a small project designed to assist Year 7 teachers with formative assessment activities/lessons that might reveal where students are at in their understanding of important mathematical concepts. The focus is on fractions, capacity, geometric transformations and data analysis.

**Keywords:** Assessment

**D20  Sundials And Other Solar Instruments**

Tim Byrne - VIC

**Workshop**

Years 5 to 8

We are given one day at a time to live, so our fundamental unit of time is arguably the day. We divide the day into 24 parts and further subdivide that into 60 parts and even further into 60 parts before becoming metric. Curiously, time is the only area which has largely resisted metrification, for reasons which are worth reflecting upon. In this workshop, participants make simple instruments without moving parts that have worked for millennia. This workshop helps participants create instruments which mark the passing hours and minutes; while also creating an instrument which monitors the apparent passage of the sun across the sky. Modifications for each location are explained. Participants will be invited to consider the possibilities of a metrification of time, namely, a sundial for a metric day. What would a sundial look like on another planet, like Mars where a sol is 24 hours and 37 minutes?

**Keywords:** Hands On/Measurement

**D21  Algebraic Thinking Revealed In Responses To Fraction Tasks**

Catherine Pearm - The University of Melbourne, VIC

**Workshop**

Years 5 to 9

The links between algebraic thinking and students’ experience of fractions in the middle years are not often explicitly taught. This presentation will focus on important links between fractional understanding and algebraic thinking. Based on extensive research using fractional tasks with students from Years 5 to 9 we will show how students move beyond arithmetic calculation to create chains of reasoning that are essentially algebraic. These methods are essentially multiplicative and can be generalised, in contrast to additive methods which work only with simple fractions. This presentation will introduce teachers to a range of question types and students’ successful solution strategies.

**Keywords:** Algebra/Fractions/Number

**D22  Strategies For Problem Solving**

Suze Groves - Deakin University, VIC

**Workshop**

Years 5 to 9

While Problem Solving is identified as one of the four Proficiency strands in the Australian Curriculum, there is little evidence of the type of problem solving that was included in the Working Mathematically dimension of VELS. This workshop focuses on ways in which teachers can develop their students’ sense of mathematical inquiry through mathematical activities that focus on problem solving skills and strategies.

**Keywords:** Maths by Inquiry

**D23  Teaching Statistics With Data Investigations And ‘Cool’ Tools**

Dr Dung Tran - Victoria University, VIC

Dr Max Stephens - The University of Melbourne, VIC

**Lecture**

Years 5 to 10

Data… data… data…. This session will explore what it means to teach and learn statistics through an investigative cycle focusing on data. We will explore the possibilities of students engaging with real data, using ‘cool’ tools such as Gapminder World and TuvaLabs and of teaching statistics with data. Participants will have opportunities to engage with exciting videos and use web-based tools for exploring data. Participants will be introduced to some free online data visualization tools as well as quality resources such as lesson plans and readouts to use in classrooms.

**Notes:** Please bring an iPad or laptop with you!

**Keywords:** Probability & Statistics/Technology

**D24  My Students Don’t Know Their Tables!**

Norlan Rundle - Retired Teacher, VIC

Michael O’Reilly - Retired Teacher, VIC

**Workshop**

Years 5 to 10

Too many students in the Middle Years do not have automatic recall or even efficient strategies to work out the Multiplication Facts. While they have been taught strategies to calculate their Multiplication Facts, they mostly resort to counting on their fingers, using the ‘tables’ on the back of their exercise book or calculators. This workshop will look at an alternate representation of the ‘times tables’, with associated efficient strategies for learning the Multiplication Facts. In this option you will be shown how to effectively teach the Multiplication Facts to Middle Years students who do have automatic recall.

**Notes:** Bring along a USB stick for resources.

**Keywords:** Number

**D25  Collaborative/Social Learning: Today’s Student Pathway**

Alan Power - MathsRepublic, VIC

**Lecture**

Years 5 to 12

Commercial Presentation

Every student in school today was born into the Web Age that is from 1991 when Tim Berners-Lee developed the World Wide Web. They were also born into the social media world of connections, sharing, being and working together any time. Teachers were not and must meet the challenge of bridging the massive gap between teaching traditionally and learning of web-age students. MathsRepublic will present the findings of a Macquarie University study regarding collaborative learning through problem-solving to support its premise that today’s learning pathway is very different.

**Keywords:** Online Learning

**Repeated as J20**

**Keywords:** Maths by Inquiry/Problem Solving

**Repeated as G30**

**Keywords:** Number

**Repeated as N15**

**Keywords:** Problem Solving/Student Activities
Non-Intuitive Mathematics
Ken Ellis - Retired Maths Consultant New York City, Trinity College, and Colac College, VIC
Rick Swan - Retired Maths Consultant New York City, Bendigo Senior Secondary College, VIC

Workshop
Years 5 to 12 & Adult
We will present a workshop involving hands-on activities that can be used with students from Year 5 to adult. The results are unexpected and the activities can easily be extended.

Notes: A standard calculator and smartphone would be helpful.

Keywords: Hands On/Technology
Repeated as B27

Programming Mathematical Algorithms
Greg Breese - Glen Waverley Secondary College, VIC

Computer Workshop
Years 7 to 9
The Victorian Curriculum has included elements of algorithmic thinking within mathematics and digital technologies. This hands-on workshop will show how several mathematical algorithms can be implemented within a visual block-based programming environment.

Keywords: Coding
Not Repeated

Investing In Teachers: A System Plan
Catherine Smith - Catholic Education Office, NSW
Paul Stenning - Catholic Education Office, NSW

Lecture
Years 7 to 10
The creation of any new curriculum creates opportunities for teachers to review and evaluate their current practices and the achievements of their students with a view to improve learning opportunities. As noted by Peter Sullivan in Chapter 9 of the 2012 MERGA publication “Engaging the Australian National Curriculum: Mathematics - Perspectives from the Field”, the take up of these opportunities will largely depend on the type and nature of the support teachers are given. This session will explore the response by a system of schools to significantly invest in teacher learning using current research and best practices to drive the development of key initiatives.

Keywords: Leadership
Repeated as I24

Why We Should Lower The Average Marks Of Females In STEM
Felicity Furey - Machinam, QLD
Jillian Kenny - Machinam, QLD

Lecture
Years 7 to 10
Only 11% of today’s engineers are women. Imagine what our world might look like if that balance was fifty-fifty. How might our cities, school or hospitals be different? 90% of female engineering students have an OP 1, dramatically higher than their male counterparts. It starts with the perception that females need to be at the top of their class to select senior maths in high school. We need to lower the average marks of females in STEM, not by lowering the top scores of our females, but by getting more females with lower scores to join their male counterparts.

Notes: This presentation forms the first part of a two-part suite, the second part of which is the workshop: Maths - Not for People Like Me.

Keywords: STEM
Not Repeated

Differential Learning With Pearson Maths 2nd Edition
Julian Lumb - Pearson, VIC
Daniel Hernandez - Pearson, VIC
Tim Carruthers - Pearson, VIC

Computer Workshop
Years 7 to 10
Commercial Presentation
Differentiating content for students at different stages is a crucial aid to learning. We will work through planning for a new topic with Pearson Mathematics 2nd Edition, including ways to use digital and print content together. Pearson’s innovative new digital product Lightbook Starter provides useful tools for formative assessment and tracking of student progress, to identify students’ needs and help facilitate learning. In this session you will also be able to explore the capabilities of Lightbook Starter from both a student and teacher user perspective.

Keywords: Differentiation
Not Repeated

What Happens When Challenging Tasks Are Used In Mixed Ability Middle School Mathematics Classrooms?
Karen Perkins - Saint Ignatius College, VIC

Lecture
Years 7 to 10
The topics of Decimals and Polygons were taught to classes by using challenging tasks. Students were given a pre-test and a post-test that contained some of the same NAPLAN questions and a comparison was made. Prior to teaching through challenging tasks, students were surveyed about their mindset in regards to mathematics and how they think they learn best. They were surveyed again at the completion of the project to see if there were any changes.

Keywords: Innovative Models
Repeated as E35

re(Solve) Mathematics By Inquiry In The Secondary Classroom
Michael Klinkert - Australian Academy of Science, ACT
Dr Steve Thornton - Australian Academy of Science, ACT

Workshop
Years 7 to 10
(reSolve) Mathematics by Inquiry is an Australian Government funded project designed to promote inquiry approaches to mathematics from Foundation to Year 10. The approach adopted empowers students to reason mathematically, emphasizing the key aspects of formulating complex problems and communicating and evaluating the solution. In this workshop we will demonstrate some of the secondary resources being developed for students and teachers. Participants will experience the spirit of inquiry through reSolve tasks that are mathematically purposeful, challenging yet accessible and supportive of a knowledge-building culture.

Keywords: Innovative Models/Maths by Inquiry
Not Repeated

MAV Year 10 Maths Camp
Helen Haralambous - The Mathematical Association of Victoria, VIC

Lecture
Years 7 to 10
In 2016 the MAV conducted a one week Stimulus camp for rural Year 10 students who were gifted or talented in mathematics. Schools were given the opportunity of nominating up to two students significantly above average in their mathematical performance at Years 9/10 levels. Students participated in a one week city camp involving ‘city experiences’ and a variety of problem solving challenges and enjoyable activities. Mathematicians from commerce, industry and other fields shared their experiences and inspired the students to similar occupations. Mathematicians from Melbourne’s universities and research institutes were guest lecturers and mentors for the participants. An online community was be established to enable this group to keep in touch and to work together on challenges created for them. Students worked in teams with industry mentors and were presented with a real life scenario problem, from that industry, to solve in the week. This session will offer information for schools interested in having their students participate in the 2017 program and will include the 2016 resources developed, the program and student feedback. Resources will be shared and can be adapted by teachers as project/problem solving materials for their classes.

Keywords: Student Activities
Not Repeated

TI-Nspire Basics For Teachers With Limited Experience Of The Technology
Frank Moya - Educational Consultant, VIC

Workshop
Years 7 to 12
This is a hands-on workshop in which participants will gain confidence using computational, graphing and statistics functionalities of TI-Nspire CAS technology. In addition to providing participants with calculator skills, the activities featured in the workshop will also illustrate how the technology might be used to enhance the teaching and learning of mathematics.

Notes: Loan calculators will be available, if required. Alternatively, bring your own TI-Nspire calculator or software.

Keywords: Technology
Not Repeated

Mathematica and Wolfram|Alpha, Coding And Functionality To Access Real-world Data
Ian Willson - VIC

Computer Workshop
Years 7 to 12
Use the Wolfram language of Mathematica to access an astounding array of data to provide real-world contexts for mathematical activities. Use the language to obtain real data that can be used across all secondary years for activities in computation, statistics and graphical work. Reference will also be made to the Wolfram|Alpha computational knowledge engine and its use in the classroom.

Notes: Participants may choose to bring their own laptops with Mathematica software loaded.

Keywords: Coding/Technology
Repeated as I31

2016 MAV Annual Conference
D36  Examview 101: Build A Sustainable Assessment Environment
John Meng - Rooty Hill High School/MANSW, NSW
Lecture  Years 7 to 12
This workshop aims to introduce teachers an effective tool, ExamView, to frequently assess, track, and analyse student comprehension of the subject content taught. In this hands-on workshop John will demonstrate how to effortlessly create study guides, quizzes and tests from the ExamView question banks. In addition, all the participants will learn how to instantly generate a wide range of assessment result analytics through ExamView Test Manager, which will be used to guide future teaching.
Notes: Bring your own laptop or mobile device to the workshop.
Keywords: Assessment
Repeated as G39

D37  Problems Worth Exploring
Shane Dempsey - Baimbridge College, VIC
Peter Fox - Texas Instruments, VIC
Workshop  Years 7 to 12
In this workshop we will explore infrequently asked questions; the type that provide multiple entry and exit points, exploration, span multiple mathematics disciplines and provide opportunities for extension. Whether your exploring hallstones, calculating factors, intersecting attitudes or measuring complex distances, there is bound to be something here that stimulates your dendrites and engages your students. Sorry, due to time restrictions, problems such as Fermat’s last theorem will not be solved in this workshop.
Notes: Bring your CAS calculator. There will be spares available.
Keywords: Technology
Repeated as C35

D38  A Guide To Cambridge’s Online Resources Powered By HOTmaths
VJ Gunawardana - Cambridge University Press, VIC
Lecture  Years 7 to 12
Commercial Presentation
HOTmaths is Australia’s premier online resource to teach and learn mathematics. Cambridge has loaded the new editions of the Essential Mathematics for the Australian/Victorian curriculum series (7-10), the new Cambridge Senior Maths for Australian Curriculum/VCE series (11-12) and Cambridge GOLD maths onto the HOTmaths platform. This workshop will highlight how these new titles have been integrated with HOTmaths and demonstrate how to navigate through all of these interactive resources. Learn how you can make the most of both the student resources and the Learning Management System for teachers. Whilst HOTmaths offers courses for Years F-10, this workshop will focus on secondary only.
Keywords: Online Learning
Repeated as G44

D39  Making Flipped Learning Work For Your Class
Ben Dennis - Terang College, VIC
Lecture  Years 7 to 12 & VCAL
In this session staff will learn the benefits of flipped learning and practical advice on how it can be implemented. Hear how flipped learning can increase the productivity of students and reduce the workload of staff.
Keywords: Innovative Models/VCAL
Repeated as J34

D40  Teaching Mathematics In The Light Of STEM
Karim Noura - Bayside P-12 College, VIC
Lecture  Years 7 to 12 & VCAL
Teachers will share some practical maths activities in the light of STEM program (Science, Technology, Engineering & Maths).
Notes: Bring calculator & computer.
Keywords: STEM/VCAL
Repeated as J35

D41  Teaching Mathematics To Secondary Students Who Have Major Gaps In Their Mathematical Understanding
Leith Pavlinovich - Maths Association of Western Australia, WA
Workshop  Years 7 to 12 & VCAL
Teaching Mathematics to students in Years 7-12 who simply ‘do not get it’ is extremely challenging for Secondary Mathematics teachers. The Mathematics Association of WA has developed a resource based on the Australian Core Skills Framework Level 3, suitable for students with significant gaps in their learning. In this session, we will work through some of the number strategies and the mathematical thinking processes that Secondary Mathematics teachers have successfully used to assist students to graduate as numerate adults and to pass OLNA, the WA test designed to recognise a minimum standard of numeracy.
Keywords: Learning Needs
Repeated as H37

D42  Using Algorithms To Make Better Decisions
Kyle McColl - The University of Melbourne, VIC
Michael Kirby - The University of Melbourne, VIC
Workshop  Years 8 to 12
This hands-on workshop demonstrates how to incorporate algorithms into your mathematics classroom. How do algorithms run our computers and our lives? These sample lessons will explain how they work, provide practical and engaging tasks and show students how to take advantage of them to make better decisions in their own lives.
Keywords: Coding
Repeated as J36

D43  Using Sliders Functionality In Ti-Nspire For Graphical Exploration
Yew Fook Chan - School of the Arts, Singapore
Workshop  Years 9 to 11
In this workshop, participants will be taught to plan, design and create learning activities for their students in exploring the graphical features of standard functions, e.g. linear, quadratic, exponential, logarithmic, trigonometric and reciprocal. Teachers will learn how to use the sliders functionality in TI-Nspire to effectively and efficiently help students make connections and understand the use of parameters in investigating the graphs of functions.
Notes: Please bring along TI-Nspire CX or CAS handheld or computer software with OS version 4.2.
Keywords: Technology
Repeated as C37

D44  Approaches To Mathematical Literacy Tasks: Findings From A Study Involving Mathematics And Mathematical Literacy Learners
Dr France Machaba - University of South Africa, South Africa
Lecture  Years 10 to 12
This presentation emerges from an analysis of a C07 learners’ responses to a Mathematical Literacy task (Task 4) presented to learners studying Mathematics and Mathematical Literacy in South Africa. Officially, Mathematics and Mathematical Literacy are two separate learning areas. Learners from Grade 10 onwards are supposed to take either one or the other but not both. It means that there is a potential that by the time learners reach Grade 11, they would have acquired different levels of knowledge and problem-solving skills depending on which of these they take. This presentation presents an analysis involving data from Mathematics and Mathematical Literacy learners which shows that it was possible for Mathematical Literacy to stand alone – to assume an exclusive identity. Using a qualitative and quantitative approach, it is argued that a Mathematical Literacy task will largely have many other aspects (especially Mathematics) embedded in it. What gives Mathematical Literacy an identity cannot be divorced from Mathematics. This assumption is illustrated by examining the ways in which Mathematics and Mathematical Literacy learners solved a Mathematical Literacy task.
Keywords: Literacy
Not Repeated

D45  How Mathematical Modelling Can Help You Understand The World
Jan Brugård - Wolfram MathCore, Sweden
Lecture  Years 10 to 12
Commercial Presentation
Using Wolfram SystemModeler it is possible to develop mathematical models in a large variety of areas, including mechatronics, computational biology, and social science. This presentation will illustrate how you can use a graphical environment like SystemModeler to easily create complex systems of differential algebraic equations (DAE’s) in order to perform advanced simulations. Making it possible for students to study and understand realistic systems while getting an insight to how powerful mathematics can be. You will also learn how Victoria teachers and students can gain free access to the software.
Keywords: Technology
Repeated as J40
D46 There Is An App For That!
Jim Lowe - QLD University of Technology, QLD
Workshop Years 10 to 12
Whether it is iOS, Android or even Windows there are Apps in existence for just about anything. This session will look at a few Apps that in addition to their intended function also provide useful information and data that we can use in the mathematics classroom. Data can be extracted from these and further investigations carried out using any of the technologies available in schools. The hands-on activities will make use of flight data that can be used to introduce some calculus concepts. Participants will learn how to use the Apps to obtain custom data for students or alternatively use the apps and activities to be provided during this workshop.
Notes: TI-Nspire technology used in the workshop, laptop helpful.
Keywords: Technology
Repeated as H42

D47 Further Maths Examinations 1 & 2: Advantageous Use Of The CAS Calculator
Kevin McMennamin - The Peninsula School, VIC
Workshop Years 10 to 12
This session will look at questions from this year’s papers and discuss how useful applications of the CAS calculator aided in finding many answers. The use of pre-programmed material and ways information assisting calculator functionality could be recorded in the bound reference will be addressed. The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students. The session is open to TI-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad.
Notes: Bring along your own calculator. Some ClassPads will be available for loan.
Keywords: Technology
Repeated as H43

D48 ClassPad For Further Mathematics
Charlie Watson - The Tuition Centre, WA
Lecture Years 11 to 12
This option will focus on efficient test and exam use of ClassPad by Year 12 Further Math students, with a backwards glance at preparatory work from Year 11 General. Participants will develop an awareness of key ClassPad skills that FM students should develop for use when solving mathematical problems and applying mathematical processes. Useful eActivities, programs and functions will be demonstrated and shared. A reasonable working knowledge of ClassPad will be assumed in the session, but don’t let that put you off – just come along, sit back and see what’s possible.
Notes: You may choose to bring your own ClassPad calculator to this session, as only a few loan models available.
Keywords: Technology
Repeated as G49

D49 How To Teach Specialist Maths, If You Must
Marty Ross - VIC
Lecture Years 11 to 12
In reality, Specialist Maths is not all that special. However, the subject does include some genuine mathematical ideas, along with the predictable oddities and half-topics. In this talk we’ll try to clarify some of the deep and weird and tricky parts of the subject. In particular, we’ll try to create a sensible path through the new and thoroughly idiotic jungle-topic of statistical inference.
Keywords: Jungle Clearing
Not Repeated

D50 Further Mathematics Matrices Module Using The TI-Nspire
Russell Brown - Educational Consultant, VIC
Workshop Years 11 to 12
In this hands-on session we will cover many aspects of the new Further Mathematics Matrices module using the TI-Nspire. It will include matrix terminology such as binary and permutation matrices, inverse matrices, solving simultaneous equations, dominance and communication matrices, recursion using matrices. Many hints and shortcuts will be demonstrated. A short analysis task will also be shown. TI-Nspire CAS calculators will be available if required.
Notes: Bring your TI-Nspire CAS handheld.
Keywords: Technology
Repeated as C47

D51 Volumes Of Revolution Using TI-Nspire
Tim Grabovszky - The Hutchins School, TAS
Raymond Rozen - RMIT University, VIC
Workshop Years 11 to 12
Volumes of revolution are often difficult to visualise. We will look at how to construct volumes of revolution on the TI-Nspire calculator. This is a very dynamic application that enables you rotate the object and view it from different perspectives. TI-Nspire calculators will be provided if you do not have your own.
Notes: Please bring along your TI-Nspire handheld, iPad or laptop.
Keywords: Technology
Repeated as E49

D52 ClassPad: CAS For Learning In Maths Methods Units 3 & 4
Ian Sheppard - Geelong College, VIC
Workshop Years 12 to 12
From the extensive range of ClassPad activities written to the Australian CurriculumATAR courses, the presenter will share reflections on his use, classroom practice and adaption of the resources to the VCE Maths Methods units 3 & 4 course. These activities are designed to be used as introductions to topics enabling students to explore and develop deeper conceptual understanding. That is the device is being used as tool to assist learning rather than an extra to be taught. The workshop part of the session will allow participants to work through some of the material.
Notes: Please bring Casio ClassPad or emulator.
Keywords: Technology
Not Repeated

2:20pm-4:40pm Session D-E (THURSDAY)

D-E1 Dyscalculia And Low Numeracy, Diagnosis And Intervention
Ann Williams - VIC
Lecture Years 1 to 10
In the first hour: The definition and causes of dyscalculia. How to ‘spot’ dyscalculia in the classroom and how to differentiate between dyscalculia and ‘common or garden’ Maths difficulties. How it affects a child’s self-belief system, in particular, Maths anxiety. There will be a brief discussion of the genetics and neuroscience underpinning dyscalculia and many resources and useful websites will be given. During the second hour there will be a description of a selection of multisensory concrete materials that the author has successfully used to help all students understand both arithmetical and algebraic concepts. This two hour PD will satisfy VIT requirements for APST 1.6.
Keywords: Learning Needs
Not Repeated

D-E2 What Is Flipped Learning About And How Does Adobe Help?
Dr Tim Kitchen - Adobe, VIC
Lecture Years 4 to 12
Commercial Presentation
Flipped Learning is about making the most of class time. It is about teachers delivering instructional content outside of the classroom, usually for homework and usually via streamed video. This allows for more time in the mathematics classroom, for students who need extra support. Adobe has a range of simple to use flipped learning solutions that will be shared in this sessions by Dr Tim Kitchen, Adobe’s Senior Education Specialist for Asia Pacific.
Keywords: Technology
Not Repeated

D-E3 Maths Inside - Maths Engagement Through Rich Tasks
Dr Mary Coupland - UTS, NSW
Associate Professor Anne Prescott - UTS, NSW
Dr Marco Angelini - UTS, NSW
Lecture Years 8 to 12
This session discusses the “Maths Inside”, presenting maths resources, outlining early results of implementation, as well as the main purposes and design choices that aim to support mathematics engagement and learning in schools. The project is designing authentic rich tasks that show the ways maths is used in real world applications, along with videos illustrating scientific applications of maths based technologies. At completion, Maths Inside intends to be able to offer a substantive and evidence-based perspective on maths learning in Australian secondary schools, together with learning tools that can facilitate effective teaching practices.
Keywords: Innovative Models
Not Repeated
D4 E Challenging Tasks For The Early Years (Foundation - Year 2)
Nadja Walker - Benton Junior College, VIC
Lisa Cuming - Benton Junior College, VIC
Workshop Years 10 to 12
As part of the EPMC Challenging Tasks project, Benton Junior College has been developing ways to engage our Early Years students in complex and challenging mathematical learning tasks. This hands-on workshop will explore some of the tasks that have been successful with Foundation to Year 2 students. The workshop will involve lessons, lesson ideas, student videos and works samples.
Keywords: Maths by Inquiry/Problem Solving
Repeted as J1

E1 TUNE ME IN, Short Sharp Maths Warm-Ups To Get Your Lessons Rolling
Tim Colman - Stonnington Primary School, VIC
Jono Schmidt - Stonnington Primary School, VIC
Workshop Years K to 6
Do you want to engage and excite your students at the beginning of every Mathematics lesson? In this workshop participants will work through a series of hands-on practical short activities to implement at the beginning of their Mathematics lessons. The session will highlight simple and effective tuning in activities in across P-6 in a mixed ability classroom. Join us in this interactive workshop! Dice games, card games and engaging picture books will be explored.
Keywords: Games/Hands On/Number/Student Activities
Repeted as J4

E2 Self-selected Mathematics Learning
Doug Williams - Mathematics Centre, VIC
Workshop Years K to 12
When you learn to read, people read to or with you. It’s critical; but it’s not enough. You must also have the opportunity to choose your own texts and read for yourself. That’s why we have libraries. When you learn to work like a mathematician, people need to show you or work with you. It’s critical but it’s not enough. You must also have the opportunity to choose your own problems and do mathematics for yourself. That’s why we have libraries of Mathematics Tasks, Picture Puzzles, Pub Menus and Menu Maths Packs. Explore these invitations to work like a mathematician and assess their value.
Keywords: Maths by Inquiry/Problem Solving
Repeted as C5

E3 Maths Card Games In Early Childhood F-2
Richard Korobosky - Duodah Pty Ltd, WA
Workshop Commercial Presentation
Get your students excited to learn and communicate mathematically playing maths cards games: Subitising Game, Count - Oh Game, Numbers 20-110 Game and the Problemo Game. The cards are enjoyable, challenging and adaptable to different student ability levels and differentiate the early childhood classroom. See how you can get students to practice basic facts using a different strategy, focus on mathematical language, see the same concept represented in different ways and develop student’s flexible mathematics thinking.
Keywords: Games
Repeted as G4

E4 Digital Tools To Capture The Proficiency Strands
Brent Hughes - Sydney, NSW
Lecture Years F to 6
Commercial Presentation
Too often children are shown how to do something then asked to move to fluency. Too often digital tools are used to enhance this fluency. Too often this leads to monumental gaps in a child’s conceptual understanding. I can help stamp all of this.
Notes: Bring something that connects to the internet.
Keywords: Technology
Not Repeted

E5 Algebra Has An Identity Problem
Jan Cavanagh - Queensland University of Technology, QLD
Workshop Years F to 8
Students have been told, or just pick up the vibes from parents and other adults that Algebra is difficult. We need to reverse that culture by teaching for understanding at whatever level they are at. Early Understandings of Algebra skills can be developed at any stage by acting out Change and Functions the YUMI Deadly Way. This begins from un-numbered examples through Arrow Maths, backtracking to solving equations, functions and graphs.
Keywords: Algebra
Not Repeted

E6 Teachers’ Emotional Mechanisms To Support Learning In Classroom
Xin Zhao - The University of Melbourne/South West University, China
Dr Max Stephens - The University of Melbourne, VIC
Lecture Years F to 9
Can teachers use the power of emotion to improve the quality of students’ learning? The emotional contribution of the teacher is often ignored in planning lessons, but emotional messages are inevitably received by students. Different students may experience positive emotions such as excitement and interest, while others may experience negative emotions such as anxiety and boredom. The relationship between teachers’ emotional input and resulting learning is not automatic or mechanical. Based on current classroom studies from China, this session will provide a practical framework through which teachers can employ emotions to more effectively integrate emotional dimensions into the mathematics classroom.
Keywords: Innovative Models
Repeated as H7
E10  Essential Assessment – Victorian Curriculum Assessment And Curriculum Made Easy
Andrew Spitty - Essential Assessment, VIC

Lecture
Years F to 10

Commercial Presentation

Essential Assessment provides an easy and affordable way for Victorian Primary and Secondary schools to deliver a consistent and whole school approach to Victorian Curriculum numeracy assessment and curriculum. Essential Assessment delivers a whole school approach to formative and summative assessment for Victorian schools and delivers an online differentiated assessment and curriculum model aligned to the content descriptions of the Victorian Curriculum. Our online assessment program assesses and develops student knowledge within each proficiency standard while delivering a reportable Victorian Curriculum Level or Progression Point for each student. Our online assessment program then creates a differentiated online curriculum to progress each student understanding within each sub-strand of the curriculum!

Keywords: Assessment
Repeated as G11

E11  Prompting Productive Mathematical Discussions
Dr Amie Albrecht - University of South Australia, SA

Workshop
Years F to 12

Mathematical conversations are crucial to learning. By trying to explain their problem-solving approaches and solution strategies to convince others that they are right, students refine their thinking and improve their problem-solving skills. Appropriate tasks, in which everyone can meaningfully contribute ideas, also help students feel valued and mathematically competent. This workshop will be packed full of tasks, ideas and structures to encourage rich mathematical discussions with links to a range of resources.

Keywords: Problem Solving
Not Repeated

E12  Effective Use Of ICT And Digital Technologies In The Mathematics Classroom
Chantelle Polkinghorne - Ringwood North Primary School, VIC
Ben Allen - Ringwood North Primary School, VIC
Caitlin Chandler - Ringwood North Primary School, VIC

Workshop
Years F to 12

Using ICT and digital technologies effectively in the classroom provides opportunities to enrich children's mathematical understandings. In this workshop, teachers from Ringwood North Primary School will share how user-friendly and easily accessible digital resources can be employed to support, enhance, and personalise student learning in maths from F-6 and beyond. This session promises to be engaging and you will leave with creative ideas that can be easily implemented into any classroom!

Notes: Bringing a fully charged iPad or laptop for this session will enhance your understanding of the tasks presented.

Keywords: Technology
Repeated as C11

E13  The Importance Of A Growth Mindset In Mathematics (What The Dweck??)
Leanne McMahon - AMSI, VIC

Lecture
Years F to 12

According to Carol Dweck, there are two fundamental mindsets that a student (or a teacher) can have about intelligence: it is fixed, or it is fluid and can increase with practice and training. These two mindsets strongly affect students’ perception of their intelligence as well as achievement. Dweck believes addressing mindsets is a central area in educators can work to close the achievement gap. In this option we will look at developing a growth mindset as teachers and the research on its power in improving student outcomes in mathematics.

Notes: There is an online quiz if participants would like to determine their prevailing mindset at the session. Participants will need their iPads or laptops to complete it. Resources and links will be provided for later use.

Keywords: Innovative Models
Not Repeated

E14  Go Further With PAT Maths
Pauline Rogers - ACER, VIC

Lecture
Years 1 to 10

Commercial Presentation

A constant question for teachers is “Now that we have our student data, what is best to do next?” This presentation will bring you up to date with recent enhancements to ACER’s PAT Maths materials, such as i) extension to Early Years against the existing common PAT scale; ii) the power and flexibility of online reporting; iii) the use of PAT testing to inform teaching and learning; iv) the richness of the PAT Resources Centre materials for deepening understanding of mathematics pedagogy. This all amounts to re-framing the teacher’s role as one of action research.

Keywords: Assessment
Repeated as H12

E15  Inquiry-based Mathematics
Shyann Drury - Scitech Discovery Centre, WA
Scott Hamilton - Portland Primary School, VIC

Workshop
Years 1 to 10

The inquiry approach to mathematics gives students agency in their own mathematical thinking, and teaches them to ‘think like mathematicians’. Students learn how to formulate questions, and regulate their own learning. They learn how to investigate in a way that leads to meaningful conclusions, and how to justify, provide reasoning, and prove their results. Shyann Drury has been working on action research projects trialling out the implementation of inquiry-based maths in early childhood and primary education, in collaboration with Curtin University and the Maths Association of WA. In this interactive workshop, he will share teaching methods informed by this research.

Notes: Scientific calculators are handy but not essential.

Keywords: Maths by Inquiry
Not Repeated

E16  Using Sequenced Lessons To Develop Students’ Multiplicative Thinking
Lei Bao - Leopold Primary School, VIC

Workshop
Years 2 to 8

It is believed that understanding multiplication is a significant step in learning mathematics and understanding the developmental stages of multiplicative thinking is an important step for teachers to help student build multiplicative thinking skills.

Keywords: Multiplicative Thinking
Repeated as G17

E17  Numeracy: Going Beyond Fluency
Karen McDaid - Western Sydney University, NSW

Workshop
Years 3 to 6

It can be difficult to support student learning and achievement in NAPLAN without feeling like you are teaching to the test. This hands-on workshop will provide you with classroom ready ideas where all the activities are linked to the numeracy demands of NAPLAN. All of the activities go beyond fluency, focus on problem solving have the proficiencies embedded within them.

Keywords: Assessment/Problem Solving
Repeated as B15

E18  Grade 3/4s Developing Big Mathematical Ideas: Sharon’s Little Red Book
Sharon Goldfinch - Brunswick South West Primary School, VIC
Dr Gaye Williams - Deakin University, VIC

Workshop
Years 3 to 6

Sharon’s little red book containing her notes and reflections whilst working with Gaye stimulated this presentation. It is very precious to Sharon and often makes Gaye smile as Sharon refers to it as an authority in discussions with other teachers. Gaye is astounded at what Sharon has achieved through this reflective process and will point to key features as Sharon shares her insights and surprises and their relevance across the curriculum. Sharon and Gaye will share their amazement as Sharon’s Grade 3/4 class excitedly developed ‘big mathematical ideas’. This session is a must for primary teachers considering changing their practice.

Keywords: Innovative Models
Repeated as J12
E19  There's A Lot More To Times Tables Than Meets The Eye
Christine Lenghaus - Tararatong College, VIC

Workshop  Years 3 to 10

Wouldn't we all love our students to have their times tables at their fingertips, without a calculator? That doesn't match the reality of my classroom. In this hands-on workshop, use the resources that I have developed, in a visual and kinaesthetic system for teaching multiplication and division, which goes beyond rote and is suitable for starting to teach these concepts through to completing the square. Understanding multiplication is essential as it is the foundation of nearly all secondary maths but very few of our students see the patterns in numbers, carry over into topics such as Algebra.

Notes: All resources and templates will be uploaded to Box and the link given to participants.

Keywords: Innovative Models  Repeated as J14

E20  Algorithms And Coding Content In The New Victorian Curriculum
Megan Blanch - Mathspace, VIC
Ash Breen - Mathspace, VIC

Lecture  Years 3 to 10

Are you ready to teach the Algorithm and Coding content of the new Victorian Curriculum next year? At Mathspace we pride ourselves on being able to quickly adjust to curriculum needs. In this workshop we will review the content of the new curriculum, share ideas and strategies for teaching Algorithm and Coding at multiple year levels and you will walk away with free resources that can be used immediately in the classroom.

Keywords: Coding  Not Repeated

E21  Engaging Games To Develop Skills, Confidence And Higher Order Thinking
Andrew Lorimer-Derham - St Mary's Primary School, VIC

Workshop  Years 3 to 10 & VCAL

Commercial Presentation

Ever heard the words “Maths is boring?” This session exists to prove otherwise. A hands-on workshop catering for all learning styles with a variety of engaging games. The Think Squares is a dynamic teaching and learning tool designed to develop skills, confidence and higher order thinking in your students. Be inspired by creative activities you can use in your own classroom. This workshop is ideal for innovative mathematics teachers.

Keywords: Games/VCAL  Repeated as J15

E22  Understanding Where Learners Are In Their Learning Requires More Than Skills-based Assessment
Professor Dianne Siemon - RMIT University, VIC

Lecture  Years 4 to 9

Starting with where learners are in their learning is a familiar and widely accepted approach to the teaching and learning of mathematics but how do we know where they are really at and what matters most? Finding out that a significant number of Year 5 students gave an incorrect answer to a subtraction problem is valuable to know but what does it mean for practice? When an error is made on a routine factorisation exercise in a computer-based game, what does it mean for practice? When an error is made on a routine factorisation exercise in a computer-based game, this session will make a case for focussing on the big ideas and conceptual understanding as the means to improve student learning outcomes rather than a focus on narrow procedural skills.

Keywords: Assessment  Not Repeated

E23  Using Big Ideas To Connect The Dots In Mathematics
Dave Tout - ACER, VIC
Jim Spithill - ACER, VIC

Lecture  Years 4 to 10

Big ideas thinking helps teachers and students to see the connectedness in mathematics. Sometimes a top-down approach to thinking about curriculum works best. But faced with the reality of dot-pointed curriculum documents it is sometimes necessary to take a bottom-up approach. This presentation will look at some of the research around Big Ideas thinking, and give examples of how to employ it.

Keywords: Innovative Models  Repeated as H17

E24  Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview
Craig Bauling - Wolfram Research, USA

Lecture  Years 4 to 12

Commercial Presentation

The Victoria Department of Education is supplying to all public and private schools the complete Wolfram suite including:

- Mathematica for higher secondary explorations,
- Mathematica Online for iPads and Tablets,
- Wolfram|Alpha Pro for cross discipline exploration,
- Wolfram Programming Lab for introductory coding and Algorithm explorations, and
- Wolfram SystemModeler for visual modelling and simulation.

Join Craig Bauling as he presents an overview of these tools and details on how to gain access for you and your students.

Keywords: STEM/Technology  Repeated as G23

E25  Using Concrete And Visual Representations For Conceptual Understanding Of Operations Involving Fractions
Dr Heather McMaster - University of Tasmania, TAS

Workshop  Years 5 to 7

Fractions have multiple meanings and there are multiple ways in which fractions can be represented. This confusion impede the progress of students in the middle years in their ability to conceptually understand and work with fractions symbolically. In this workshop, participants will discuss approaches to teaching common fractions in Years 5-7 of the Australian Curriculum. The aim is for students to develop mental strategies for working with fractions by being able to “see them” in their heads.

Notes: Bring your own laptop if possible.

Keywords: Fractions/Number  Repeated as J18

E26  Scaffolding Statistics Understanding In The Middle School
Professor Jane Watson - University of Tasmania, TAS

Lecture  Years 5 to 10

The Reforming Mathematical Futures 2 Project (RMIT and AAAMT) is building a learning and teaching resource to enhance mathematical reasoning in Years 7 to 10. One of the focus content areas is Statistics. Based on the results of survey items completed by students in the project schools across Australia, tasks and scaffolding strategies will be suggested to improve student understanding across the years and to prepare for further study in Years 11 and 12. The session is intended to be interactive with participants solving problems and giving feedback on the strategies suggested.

Keywords: Probability & Statistics  Repeated as G28

E27  Numeracy Intervention That Works
Michelle Anderson - Numurkah Secondary College, VIC
Helen Barker - Numurkah Secondary College, VIC

Lecture  Years 5 to 11

Commercial Presentation

Here at Numurkah Secondary College we have seen growth of 0.7 years above the general population by engaging the Quicksmart Program within our school. QuickSmart aims to improve the numeracy of students who are not achieving their academic potential. Participating students may have varying levels of learning difficulties because of knowledge gaps, lack of practice, anxiety and low confidence. The QuickSmart program is a responsive small-group intervention that aims to develop fluent (Quick) and efficient (Smart) strategy use. QuickSmart uses research-based instructional strategies to support the learning of persistently low-achieving middle school students so that they are more actively and successfully engaged in inclusive classroom settings.

Keywords: Learning Needs  Repeated as H24
E28  Cloud-based Planning, Tracking & Reporting For Easy Differentiation In Today’s Classrooms
William Murray - Mentone Girls secondary College, VIC
Victoria Pichter - Full Circle Education Pty Ltd, VIC
Lecture  Years 5 to 12
Commercial Presentation
The new cloud-based Classroom Organiser enables teachers to prepare a lesson plan for every topic set for the
year and to track student progress against the set lesson plan. With separate log-in’s for students, teachers and
parents, the system enhances student self-paced learning and encourages students to work through various
levels of achievement. The system helps teachers to differentiate to meet individual student needs. The system
also enables extension students to work well ahead of their year level and teachers to monitor their progress.
The planning and tracking is easy to set up and the Classroom Organiser can import or export data in standard formats
to work in with existing school record systems.
Notes: Please bring your own laptop with access to the internet.
Keywords: Learning Needs/Technology
Repeated as J22

E29  Using Technology To Teach And Assess Probability In The Middle Years Programme
Kim Shuyue Zhang - World Foreign Language Academy, Shanghai, China
Su Yin Tse - World Foreign Language Academy, Shanghai, China
Lecture  Years 6 to 7
Introducing the idea of experimental and theoretical probability via a simple game for limited number of trials
followed by the generation of data for large number of trials using Graphing Technology. Getting students to
appreciate the use of Graphing Technology for experiential learning and assessment of Criteria C (Communication)
and D (Applying Mathematics in real-life contexts) for the Middle Years Programme, which leads to the International
Baccalaureate.
Keywords: Innovative Models/Technology
Not Repeated

E30  Differentiation Versus Modification - How Do I Effectively Differentiate For All Learning Needs
And Styles?
Elizabet Lonergan - Beth Rivkah Ladies College, VIC
Workshop  Years 6 to 10
This workshop will explain the difference between differentiation and modification and support delegates to
effectively differentiate mathematical learning using content, strategies, process and classroom layout. Delegates
will leave the session with a clear understanding of what and how to differentiate, as well as a tool box of ideas on
how to effectively cater for all learning needs, abilities and learning styles in their mathematics classroom.
Keywords: Differentiation
Repeated as G31

E31  Problem Solving Literacy, Pedagogy And Strategies
Kelly Gallivan - St Kevin’s College, VIC
Jessica Mount - Mentone Girls Grammar School, VIC
Shanna Rankin - St Kevin’s College, VIC
Workshop  Years 6 to 10
As a mathematics teacher, how often have you made the report comment that a particular student needs to improve
their ability to accurately read and solve problems? This presentation presents pedagogy that can be used to
integrate problem solving into any and every lesson. It will focus on how to teach problem solving strategies and
how to build upon students’ language / literacy skills to decode worded problems.
Keywords: Literacy/Problem Solving
Repeated as I22

E32  A Hands-on Approach To Mathematics
Kim Walker - Balcombe Grammar School, VIC
Workshop  Years 7 to 8
This workshop aims to provide teachers with practical examples of how lessons can be developed with a hands-
on approach to the teaching and learning of Mathematics at Years 7 and 8, through the use of manipulatives and
current media topics. We will look at ways to cultivate students’ curiosity by exploring the mathematics in the world
around them.
Keywords: Hands On
Not Repeated

E33  Maths - Not For People Like Me
Jillian Kenny - Machinam, QLD
Felicity Furey - Machinam, QLD
Workshop  Years 7 to 10
75% of the world’s fastest growing careers require STEM skills, yet females and other minority groups remain
underrepresented in these subjects. The accepted response to these facts is that if only we can enthuse / inspire
encourage these particular groups to enter STEM fields, then the skills shortfall will disappear. This interactive
workshop explores another avenue - the language we use to talk about STEM - and the impact it has on how people
relate to the field. Attendees will work through two teaching resources that can be run with students to help engage
and inspire girls about careers in STEM. This presentation forms the first part of a two-part suite, the first part of
which is the lecture: Why we should lower the average marks of females in STEM.
Keywords: STEM
Not Repeated

E34  Maths In A Box - Developing Mathematical Modelling Skills
Jim Lowe - QLD University of Technology, QLD
Workshop  Years 7 to 10
Using origami folding techniques to create a series of paper boxes produces a dataset which students can use to
develop mathematical models using an investigative approach. Using the measurement from the boxes, students
investigate relationships using both graphical and algebraic methods to develop models that provide solutions to
the problem posed. In this hands-on workshop participants will be involved in both the construction and modelling
activities using the available technology to provide a focus for the discussion on how best to develop students’
mathematical modelling skills.
Notes: TI-Nspire used during session but data can be entered on other technologies.
Keywords: Problem Solving
Repeated as J25

E35  What Happens When Challenging Tasks Are Used In Mixed Ability Middle School Mathematics
Classrooms?
Karena Perkins - Saint Ignatius College, VIC
Lecture  Years 7 to 10
The topics of Decimals and Polygons were taught to classes by using challenging tasks. Students were given a
pre-test and a post-test that contained some of the same NAPLAN questions and a comparison was made. Prior
to teaching through challenging tasks, students were surveyed about their mindset in regards to mathematics and
how they think they learn best. They were surveyed again at the completion of the project to see if there were any
changes.
Keywords: Innovative Models
Repeated as D31

E36  Using Challenging Mathematics Tasks And Pedagogies To Improve Achievement Of All Students
Professor Peter Sullivan - Monash University, VIC
Lecture  Years 7 to 10
This session will illustrate how using challenging tasks with appropriate pedagogies creates interesting and engaging
learning environments. In particular, the ways that such approaches enhance achievement for all students will be
illustrated.
Keywords: Innovative Models
Not Repeated

E37  Mathematical Modelling Using Handheld Technology
Thomas Yeo - Texas Instruments, Singapore
Workshop  Years 7 to 10
As Mathematics educators, we often want our students to be able to apply the concepts they learnt in class in real
life. In the Mathematics classroom, we can easily use modelling to bring that idea into the lessons. In this workshop,
participants will learn how to create simple modelling activities using the TI-Nspire handheld. The presenter will also
share his experience in using these activities in the Singapore Mathematics classroom.
Notes: Please bring a TI-Nspire CX or CX CAS if you have one.
Keywords: Technology
Not Repeated
E38 Re-Visioning Year 10: Student Ownership, Differentiation, And Rigour
Colin Shnier - John Monash Science School, VIC
Emily Breslin - John Monash Science School, VIC
Workshop Years 7 to 11
◊ How can we design a course that allows all students to learn, regardless of their prior knowledge?
◊ How can we give effective, timely feedback to students and teachers, and use it to guide student learning?
◊ How can we provide students with the opportunity and skill set to manage their own learning?
Our Mathematics faculty used these questions to guide reform of our Year 10 classrooms. In this session, some of our teachers will share our process for setting up new courses, the products we developed, and our research into their effectiveness. Teachers will leave the session with sample units and strategies to implement similar models in their own school.
Keywords: Assessment/Maths by Inquiry/Differentiation/Innovative Models
Repeats as J30

E39 Think Like A Coder
Antje Leigh-Lancaster - Pearson, VIC
Aynur Bulut - Pearson, VIC
Sophie Matta - Pearson, VIC
Computer Workshop Years 7 to 12
Commercial Presentation
In this session you will have the opportunity to explore our new python coding platform and tasks designed to develop algorithmic thinking & reasoning skills within a coding environment. They have been specifically developed to meet the 2017 Victorian Mathematics Curriculum algorithmic thinking and coding requirements. Come along and have a play.
Keywords: Coding
Not Repeated

E40 Proofs By Pictures
Adjunct Professor Mike Clapper - Australian Mathematics Trust, VIC
Lecture Years 7 to 12
This presentation presents a number of interesting algebraic and geometric problems or theorems that can be solved or proved by a purely pictorial method. These pictures can often provide striking insights into the connections between different mathematical ideas.
Keywords: Problem Solving
Repeats as J30

E41 CODE For Success In Mathematics
Peter Fox - Texas Instruments, VIC
Workshop Years 7 to 12
Coding (programming) is becoming more and more pervasive, so it is not surprising that some states have mandated it in their curriculum. The process of coding however supports neurological development that is advantageous to mathematical thinking, reasoning and problem solving. In this workshop participants will write some basic programs that explore simple mathematical conjectures, theories that have never been proven but have become increasingly accepted by numerical exhaustion. And just for fun, we’ll also explore the new TI-Innovator™, a brilliant way to engage in STEM activities.
Notes: No prior coding experience necessary. Coding will be done on the TI-Nspire calculator, however participants are welcome to BYO their own familiar coding platform.
Keywords: Coding
Not Repeated

E42 STEM With Graphing Calculators
Dr Pumadewi Sivashubramaniam - Teacher Education Institute, Malaysia
Nur Syamsila Mohd Harris - Teacher Education Institute, Malaysia
Syed Azman Syed Ismail - Teacher Education Institute, Malaysia
Workshop Years 7 to 12
This a fun filled workshop using a graphing calculator, the TI-Nspire to explore decay of carbon-14 (C-14). It is so simple one will marvel at the simplicity of the procedure. The process involves application of basic probability and the initial activity will equip you to become a fossil scientist. You will be able to determine in a few simple steps when the organism given to you existed. The workshop will then develop you into a very able captain of the 2016 Titanic equipped with sonar devices (TI-Nspire and the Computer Based Ranger), and as the very able captain you may be able to take the Titanic to its destination by avoiding the fatal coral reef. There will be several more activities and demonstrations to highlight the application of Science, Technology, Engineering and Mathematics (STEM) that a teacher can try out in his or her classroom that would provide students the lens to look at science and mathematics as relevant and important to the real world.
Keywords: STEM
Repeats as B41

E43 Mathematical Investigations Using TI-Nspire: Years 9 And 10
Frank Mooy - Educational Consultant, VIC
Workshop Years 9 to 11
The remarkable mathematician, Srinivasa Ramanujan – the subject of this year’s film “The man who knew infinity”, made ground-breaking discoveries in areas including continued fractions and infinitely-nested square roots. In this hands-on workshop, dynamic computation, using TI-Nspire CAS technology, will be used to explore phenomena related to Ramanujan’s work. In addition, the final investigation will involve the use of dynamic geometry to explore relationships between the properties of selected geometric shapes. All of the featured activities have been used successfully with students in Years 9 and 10.
Notes: Loan calculators will be available, if required. Alternatively, bring your own TI-Nspire calculator or software.
Keywords: Geometry/Technology
Not Repeated

E44 Mathematical Problem Solving With A TI-Nspire CX CAS
Dr Wee Leng Ng - Nanyang Technological University, Singapore
Workshop Years 9 to 12
Empowering students to make effective use of technological tools in the learning and application of mathematics is identified as an important objective of many school mathematics curricula. In this workshop, participants will engage in activities which explore uses of the TI-Nspire CX CAS Learning Handheld, at different stages of the problem-solving process, in solving a collection of mathematical problems suitable for upper secondary students.
Keywords: Problem Solving/Technology
Repeats as C39

E45 VCE Algorithmics (Modelling And Solving Problems)
Georgia Gouros - Distance Education Centre Victoria, VIC
Workshop Years 10 to 12
As a subject VCE Algorithmics introduces students to new ways of thinking about problem solving, building on the foundations of mathematics of the middle years of secondary education. This course gives students the opportunity to develop analysis skills through problem solving; learning how to express the solution to the problem as an algorithm. They go on to develop skills of evaluation by comparing algorithmic solutions in terms of correctness and efficiency. Students doing Algorithmics have expressed that they felt empowered with new knowledge, confidence and skills when approaching unfamiliar problems and challenges. This session will focus on exploring the creation of correct and efficient solutions by sharing some of the activities used to engage a diverse and dispersed cohort of students.
Keywords: Algorithmics
Repeats as I46
E46  Approximations, Recursion And Sampling Using The Technology Of The Casio ClassPad
Kevin McMenamin - The Peninsula School, VIC

Workshop  Years 10 to 12
The introduction of recursion, approximation techniques and sampling procedures linked to probability provides the
perfect opportunity to explore their detail using technology. This will be a hands-on experience that will utilise the
Spreadsheet, Sequences, eActivity and Statistics applications of the Casio ClassPad to model their behaviours.
Annuites, Reducing-balance home loans, Newton's Method, Bisection Method, Hypothesis testing and Random
sample generation will be the featured concepts.
Notes: Bring along your own ClassPad calculator. Some ClassPads will be available for loan.
Keywords: Technology
Not Repeated

E47  Understanding Finance - The General And Further Mathematics Courses
Robert Vernery - St Paul's Anglican Grammar School, VIC

Lecture  Years 10 to 12
Knowledge and thorough understanding of relevant skills will help to maximise student success in the Financial
Modelling core module in Further Mathematics 3&4. This lecture will explore a program from a focus on consumer
mathematics in General Maths 1&2 to an expanded understanding of loans, investments and depreciation in Further
Maths 3&4. This program, and this lecture, aims to develop student confidence and ability in skills and techniques
applicable to them all; not just in exams, but in real life decisions. Application of the calculator’s financial solver to
the solution of several past examination questions will also be demonstrated.
Keywords: Number
Repeated as G47

E48  A New Look At Trinomials
Dr Ray Williams - St Mark’s Anglican Community School, WA

Workshop  Years 10 to 12
Have you ever wondered how many trinomials have integer factors? This session provides some interesting
answers to this question using a novel approach to identify types of trinomial.
Keywords: Algebra/Algorithms/Maths by Inquiry
Not Repeated

E49  Volumes Of Revolution Using Ti-Nspire
Tim Grabovszky - The Hutchins School, TAS
Raymond Rozen - RMIT University, VIC

Workshop  Years 11 to 12
Volumes of revolution are often difficult to visualise. We will look at how to construct volumes of revolution on the
Ti-Nspire calculator. This is a very dynamic application that enables you rotate the object and view it from different
perspectives. Ti-Nspire calculators will be provided if you do not have your own.
Notes: Please bring along your Ti-Nspire handheld, iPad or laptop.
Keywords: Technology
Repeated as D21

E50  Using CAS To Teach Sampling In Methods And Specialist
Greg Neal - Ballarat High School, VIC
Agathi Neal - Federation University Ballarat, VIC

Lecture  Years 12 to 12
The session will introduce the sampling distribution of the sample means and proportions (for samples of size n) by
simulation using a CAS calculator. The sampling distribution will be used to investigate the properties of a scenario
which will involve confidence intervals, the interpretation of confidence levels and hypothesis testing.
Notes: Participants should bring a CAS calculator.
Keywords: Probability & Statistics/Technology
Repeated as H47

9:00am-10:15am Session F (FRIDAY)
Keynote Presentations

F1  Same Sermon, New Jokes
Mary Ross

Keynote  Years F to 12
So, it is remarkable what has become of mathematics education: curricula are of a whole new style, with textbooks
to match; the array of technological wizardry is endless; familiar topics are treated in ways we could scarcely have
imagined; astonishing new topics have sprung from nowhere; and on and on. It is all so different, the product of
decades of effort. In this presentation we shall seek to explain how Australian mathematics education has become
what it is, and we shall attempt to apportion due credit to all of those responsible.

F2  Learning Year Level Mathematics Curriculum When You’re Years Behind: Approaches For The
Classroom Teacher Of Students With Mathematics Learning Difficulties
Dr Rhonda Faragher - University of Queensland

Keynote  Years F to 12
The Australian Curriculum: Mathematics specifies the teaching of year level content to all the learners in the class,
with adjustments as required. This can be a very challenging undertaking when some students in the class are
many years behind their classmates. However, teachers have developed successful approaches for teaching in these
contexts, with learners accomplishing important mathematics from their year level. In this presentation, I will consider three aspects: What might be possible, how this can be accomplished and why we should do this in
the first place. Building from research undertaken in mathematics classrooms including students with significant
intellectual disabilities, strategies will be presented for adjusting lesson content, managing the whole class,
supporting individual learning needs and assessing learners.

F3  Drawing, Gesturing And Talking: Using What Comes Natural To Young Learners Of Mathematics
Professor Janette Bobis - University of Sydney, NSW

Keynote  Early Years
Drawing, gesturing and talking are natural ways that young children use to communicate and represent their
developing mathematical understandings. The interpretation of these representations is vital to teachers’ abilities
to scaffold student learning of mathematical ideas. Yet teachers are rarely taught how to notice, interpret and
respond to such important signs of student understanding. This presentation explores research and practice
surrounding young children’s use of drawing, gesturing and talking to help them make sense of mathematical ideas
and solve mathematical problems. It will introduce some practical strategies to support teachers notice and interpret
their students’ representations so that they might better support the development of their students’ mathematical
understandings.

F4  Planning For And Capitalising On ‘Teachable Moments’ In The Primary Mathematics Classroom
Dr Tracey Muir - University of Tasmania, TAS

Keynote  Primary
As teachers, we are constantly looking for ways to provide students with opportunities to engage in purposeful
and authentic mathematical experiences. On a daily basis we need to select teaching content and approaches that
will motivate and challenge our students and enable teachable moments to occur. In this keynote we will look at
examples of rich mathematical tasks that have the potential to create teachable moments. We will also look at what
happens when those teachable moments occur, how teachers and students respond, and how you as a teacher,
can capitalise on these opportunities to engage, challenge and maximise learning for your own students.

F5  Stories From The Classroom: The Practices Of Effective Teachers
Professor Doug Clarke - Australian Catholic University, VIC

Keynote  Primary
We all want our teaching to be effective as possible. A new document from the National Council of Teachers of
Mathematics (USA) offers eight ‘strongly-recommended research-informed actions’ for teachers and mathematics
leaders. In this presentation, I will share stories from the classroom and insights from my research which bring
these practices and actions to life.
In addition the power of developing 'story shells' as an additional tool to hook students in will be examined. This will of picture story books with ideas of how to develop mathematically rich and differentiated lessons will be the focus.

**F7 STEM - Mathematical Pedagogy That Supports Your STEM Program**
Yvonne Reilly, Jodie Parsons & Thao Huynh - Sunshine College, VIC

Since 2009, the Sunshine College mathematics program has been transformed from a teacher centred and textbook driven classroom to a future ready maths program which is well positioned to lead students to be fully prepared for a STEM future. The pedagogy is purposeful and fully differentiated and aligned with the Victorian F-10 curriculum. Since its inception student NAPLAN growth has exceeded the Victorian State Growth each year. In 2015, the Sunshine College maths team won two Victorian Education Excellence Awards i) Outstanding School Advancement Award ii) Lindsay Thompson Award for Excellence in Education. The success of the program has led them to be featured on Channel 7 and in newspapers in the UK and Australia. And has been featured at many conferences in Australia and around the world, most notably conferences in the US and New Zealand. The college has a regular feature at MAV since 2009. In 2015 they presented at the IMA International Conference on Barriers and Enablers to Learning Maths: Enhancing Learning and Teaching for All Learners, held at the University of Glasgow, Glasgow, Scotland.

**F8 Inclining To Explore Mathematically And Pedagogically: Students And Teachers Possessing The Same Characteristics**
Dr Gaye Williams - Deakin University, VIC

Why are some students inclined to step into unfamiliar mathematical territory where others actively work to remain within what they know? Why are some teachers not willing to even try problem solving activity, others inclined to keep trying even when their problem solving approach is not working, and others inclined to change the strategies they try over time? Do teachers and students who are inclined to explore share the same personal characteristics? If so, what are they and can we build them. We will explore these ideas and Gaye will draw on her research to show how these characteristics are enacted by students and teachers.

**11:00am-12:00pm Session G (FRIDAY)**

**G1 What’s The Story??**
Ellen Corovic - The Mathematical Association of Victoria, VIC

Participants in this professional learning session will explore a range stories to engage learners. A fabulous collection of picture story books with ideas of how to develop mathematically rich and differentiated lessons will be the focus. In addition the power of developing ‘story shells’ as an additional tool to hook students in will be examined. This will be a hands-on and engaging session.

**G2 Developing Powerful Multiplicative Strategies**
Nadine Meredith - Catholic Education Office, NSW
Tammy Roosen - Catholic Education Office, NSW
Patrice Brady - Catholic Education Office, NSW
Geraldine Caleta - Catholic Education Office, NSW

Lecture Years K to 6
Developing conceptual understanding of multiplication and division is complex. How do we move students from the known to the unknown in multiplication and division without rote drill and practice? In this session we will explore this question in practical ways as we explore a model for working with teachers in developing multiplication and division. We will look at the multiplicative structures of arrays, times-as-many and allocation and rate to improve students’ ability to think multiplicatively and develop proportional reasoning. This work was conducted in partnership with Dr Ann Downton and the Catholic Education Office, Diocese of Parramatta NSW.

**G3 21st Century Differentiated Instruction - Empowering Teachers In New Ways**
Alexander Young - Ingenious Technological Enterprises, TAS

Lecture Years K to 12
Commercial Presentation
This is a ‘world first’ means by which teachers monitor the quality of their teaching in assessment for learning. It is achieved by using their school’s photocopier, as a high speed scanner, which provides forensic feedback on each student’s learning needs. The concept of a ‘digital rubric’ for assessing both written and practical work, which enhances the clarity of teaching intent, as well as improving the transparency of feedback to students, will be introduced. This binary approach to teaching and learning lifts the outcomes of all students as it improves the quality of communication between the teacher and student.

**G4 Maths Card Games In Early Childhood F-2**
Richard Korobovsky - Dulahk Pty Ltd, WA

Workshop Years F to 2
Commercial Presentation
Get your students excited to learn and communicate mathematically playing maths cards games: Subitising Game, Count - Oh Game, Numbers 20-110 Game and the Problemo Game. The cards are enjoyable, challenging and adaptable to different student ability levels and differentiate the early childhood classroom. See how you can get students to practice basic facts using a different strategy, focus on mathematical language, see the same concept represented in different ways and develop student’s flexible mathematics thinking.

**G5 Daily Tasks To Develop Mental Computation**
Colleen Monaghan - Our Lady of the Nativity, VIC

Workshop Years F to 4
Short sharp and regular practice with mental computation makes a difference. Many teachers struggle to find engaging ways to help students become more fluent with their basic facts. These activities are easily modified to cater for all levels. In this session we will unpack a variety of activities you could take away and use in your classrooms with your students on a regular basis to improve their mental computation. We will look at setting up routines in your classroom that will enable you to have short, sharp and regular practice.

**G6 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3

**G7 Supporting Children to Think Mathematically**
Colleen Monaghan - Our Lady of the Nativity, VIC

Workshop Years F to 4
Through a range of concrete and representational tasks, participants will have the opportunity to explore strategies to support and develop children’s mathematical thinking. Participants will be provided with a range of resources and ideas to encourage children to think mathematically in their classroom.

**Keywords:** Mathematical Thinking
Repeated as C3

**G8 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3

**G9 Fostering The Development Of Mathematical Reasoning**
Dr Gaye Williams - Deakin University, VIC

Workshop Years F to 4
This session will explore the mathematical reasoning cycle, and the role of questioning and discussion in the development of mathematical reasoning. The session will focus on strategies that can be implemented in the classroom to foster the development of mathematical reasoning.

**Keywords:** Reasoning
Repeated as C3

**G10 Developing Creative Thinking And Innovation Through Mathematics**
Ann Downton and the Catholic Education Office, Diocese of Parramatta, NSW

Workshop Years F to 4
Through the Creative Thinking and Innovation Model, the session will take teachers through a process of developing their students’ creative thinking and problem-solving skills through a range of reasoning strategies. The workshop will provide teachers an opportunity to explore ways of incorporating mathematical creativity into their teaching.

**Keywords:** Creative Thinking
Repeated as C3

**G11 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3

**G12 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3

**G13 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3

**G14 Using The Early Years Numeracy Interview To Inform Teaching Practice**
Nicole Rheumer - Camberwell South Primary School, VIC
Mandy Henia - Camberwell South Primary School, VIC

Workshop Years F to 4
The Early Years Numeracy interview has long been used as an assessment tool. In this session we will look at how this data can be used in the classroom environment to inform teaching. Camberwell South Primary School has spent the last three years working through and improving our assessment practices and then transferring the knowledge into changing classroom practice. Throughout the session we will walk you through the journey that we took, and how this data is then used to target teach on a practical level. Participants will then be given the opportunity to look at planners and data and work through a planning session.

Notes: Bring own laptop – fully charged.

**Keywords:** Assessment
Repeated as C3
G7 Growing Your Mindset
Cassandra Lowry - Lumen Christi Catholic Primary School, VIC
Alanna Butcher - Lumen Christi Catholic Primary School, VIC
Workshop Years F to 6
Developing a growth mindset in students is currently a big focus in education circles but how should it be done? Can teachers actually change the way students see learning? This workshop shows how teachers at Lumen Christi Primary School have had success with using problem solving investigations and reflections as a way to help students rethink their attitude towards mathematics. It will demonstrate the activities, reflection and assessment tasks used and will give examples of the different ways in which teachers have personally embraced living with a growth mindset. Links to relevant websites and materials will be provided.
Keywords: Assessment/Problem Solving
Repeated as H4

G8 Assessing Common Misunderstandings To Support Primary Students At Risk In Mathematics
Jen Briggs - Derrimut Primary School, VIC
Workshop Years F to 6
This year, Derrimut Primary School introduced the Assessments for Common Misunderstandings at a whole school level. This session will run through our reasons for selecting these tools, the set up process and the enactment of the assessments. It will also share the experiences of teachers using the tools and the impact the assessments have had on teaching and learning, for at risk students in particular. Kits will be available for participants to explore the resources and trial the tasks.
Notes: You may wish to bring a device with you to view the assessment tools online although this is not essential.
Keywords: Assessment
Not Repeated

G9 Data Fun With Bioglyphs
Dr Leicha Bragg - Deakin University, VIC
Jessica Koch - Toorak College, VIC
Ashley Willis - Waverley Christian College, VIC
Workshop Years F to 6
Bioglyphs are a fun and engaging task suitable for all primary students to represent themselves through symbols. Bioglyphs are easy to create, entertaining to share, and offer a multitude of ways to explore data representation and interpretation. Bioglyphs present unique cross-curriculum opportunities through storytelling, understanding student populations, and developing cultural awareness. Bioglyphs can be adapted for parents’ nights, and wellbeing activities including, staff PD, student buddy time, and a host of other situations. Join us for a fun filled session to explore how Bioglyphs will enhance your students’ statistical literacy skills.
Keywords: Literacy/Probability & Statistics
Repeated as H5

G10 Mathematical Reasoning: A Top Drawer Teacher Resource
Libbie Spohn - University of Tasmania, TAS
Workshop Years F to 6
Have you heard of Top Drawer Teachers? Are you a lead teacher in Numeracy or Mathematics? TEMPEST is a national project led by the University of Tasmania (with the Australian Mathematics and Science Partnership Program) focusing on the professional learning (PL) available to mathematics teachers. One of the aims of the project is to contribute to the creation of an online portal – Dimensions which will house quality PL. In this workshop we will explore the AAMT resource supporting the Australian Curriculum-Mathematics: Top Drawer Teachers for Reasoning F to 10. Reasoning is one of the four proficiencies in the national curriculum, which describes it as a capacity for logical thought and actions. We will unpack the TDT resource and navigate this website to show examples of key ideas related to reasoning. These are organised as Big Ideas, good teaching and assessment with activities on how to encourage reasoning with your students. We will discuss how to integrate these ideas into your mathematics teaching across most strands of the curriculum and investigate how this resource could be utilised by lead teachers supporting their colleagues.
Keywords: Innovative Models
Repeated as C6

G11 Essential Assessment – Victorian Curriculum Assessment And Curriculum Made Easy
Andrew Spitty - Essential Assessment, VIC
Lecture Years F to 10
Commercial Presentation
Essential Assessment provides an easy and affordable way for Victorian Primary and Secondary schools to deliver a consistent and whole school approach to Victorian Curriculum numeracy assessment and curriculum. Essential Assessment delivers a whole school approach to formative and summative assessment for Victorian schools and delivers an online differentiated assessment and curriculum model aligned to the content descriptions of the Victorian Curriculum. Our online assessment program assesses and develops student knowledge within each proficiency standard while delivering a reportable Victorian Curriculum Level or Progression Point for each student. Our online assessment program then creates a differentiated online curriculum to progress each student understand within each sub-strand of the curriculum!
Keywords: Assessment
Repeated as E10

G12 Mathletics - Take A Fresh Look: Integrating Mathletics Into The Classroom
Lauren Anderson - 3P Learning, NSW
Tom Beardsworth - 3P Learning, NSW
Computer Workshop Years F to 10
Commercial Presentation
This session will provide you with an overview about how to successfully integrate Mathletics into the classroom. Looking at the ability to differentiate students as needed, as well as how to set curriculum topics and activities to enhance student understanding. We will also look at assessment and reporting within Mathletics. How it has changed and how to utilise this section to support your teaching. We will also take a look at the ebooks and problem solving resources, using the videos and interactives to enhance your explicit lessons.
Notes: Session One - Will be Primary Focus. Session Two - will be Secondary Focus.
Keywords: Assessment/Online Learning
Repeated as B9

G13 Building (And Rejecting!) Mathematical Intuition
Dr Amie Albrecht - University of South Australia
Workshop Years F to 12
Mathematical reasoning often relies on intuition - an instinct for what ‘feels right’ or ‘makes sense’. Problem solving can zig zag between logical reasoning and intuitive understanding, right up to the point where intuition is either confirmed or totally rejected. This workshop will explore ways in which mathematical intuition can be developed. We will also look at delightful non-intuitive mathematical problems - from probability to geometry - and discuss how to bridge the gap between wrong intuitive thinking and correct but counter-intuitive analytical calculations.
Keywords: Problem Solving
Not Repeated

G14 Planning Teacher Professional Learning To Foster Innovation In Mathematics Teaching
Professor Peter Sullivan - Monash University, VIC
Catherine Smith - Catholic Education Office, NSW
Paul Stenning - Catholic Education Office, NSW
Lecture Years F to 12
This session will be of interest to anyone leading teacher professional learning. This is the report of a particular teacher professional learning initiative that focused on an innovative approach to the teaching of mathematics. The initiative was supported by a set of resources and focussed on school based collaborative implementation of innovative approaches. Data suggest that the initiative had an impact on teachers’ practices. Key aspects of the initiative seemed to be the focus on innovation, the provision of quality resources, and the mix of external presentation of theory and school based implementation.
Keywords: Innovative Models
Not Repeated
G15  Step By Step - Maths Problem Solving Strategies Using Rich Investigative Tasks
Cathy Davidson - Bacchus Marsh Primary, VIC
Jenny Dicksey - Melton South Primary, VIC
June Penney - Pathways to Learning, VIC

Workshop  Years 2 to 5
Are your students authentic 21st Century learners? Looking for ideas to engage your students in meaningful mathematics investigations? Problem based learning - understanding, recognising and applying suitable Mathematical concepts is challenging for many students. How can we support and guide learning processes? What do I know? What is the problem asking me to do? How do I do it? How do I separate important content from distractions? READ, INTERPRET, STRATEGISE, SOLVE. We will show you how to help your students become proficient problem solvers. We will explore rich problems that encourage students to discover and communicate important mathematical concepts.

Keywords: Maths by Inquiry
Not Repeated

G16  Challenging Tasks: Multiplicative Thinking
Dr Sharyn Livy - Monash University, VIC
Dr Ann Downton - Monash University, VIC

Workshop  Years 2 to 7
We have been working with teachers and their students to explore ways of engaging students more actively in building mathematical connections for themselves. Our presentation will present some tasks on the topic of multiplicative thinking. We will share our experiences of how children apply themselves when making an effort to solve challenging mathematical tasks and the role of the teacher when facilitating these lessons.

Keywords: Multiplicative Thinking/Number
Not Repeated

G17  Using Sequenced Lessons To Develop Students’ Multiplicative Thinking
Lei Bao - Leopold Primary School, VIC

Workshop  Years 2 to 8
It has been observed that understanding multiplication is a significant step in learning mathematics and understanding the developmental stages of multiplicative thinking is an important step for teachers to help students develop multiplicative thinking skills.

Keywords: Multiplicative Thinking
Repeated as E16

G18  Formative Assessment Through Technology
Chris Daxecker - Tarneit P-9 College, VIC
John Eskander - Tarneit P-9 College, VIC

Workshop  Years 2 to 10
Commercial Presentation
Would you like a quick snap shot of your classes’ ability in a given topic? Is data sometimes arduous to analyse and provide little product for the time spent? Do you see yourself as a 21st century teacher integrating technology through every lesson? If your answer was ‘yes’, than do we have the PD for you. The idea of formative assessment does not simply rest in pre and post testing, but integrates itself through all aspects of instruction. As teachers we know that learning could be so much more successful if we could truly tailor and differentiate what we do in the classroom - but who has the time? In this workshop see how Mathspace can be used to create a learning environment for students that enables them to learn mathematics at their own pace, step by step with feedback and scaffolding to support their development of mathematical reasoning. With extensive data capture and reporting, Mathspace allows teachers to target their teaching, increasing one-to-one teacher-student time, catering for individual differences and achieving overall improved student outcomes.

Notes: Bring a laptop or tablet/iPad.
Keywords: Assessment/Differentiation
Not Repeated

G19  Kids & Cup Cakes & Poster Problem Clinics
Doug Williams - Mathematics Centre

Workshop  Years 2 to 10
A Poster Problem Clinic is a technique used to absorb learners in a problem by developing their ability to read and understand it. It will help them do better with word problems. The session is based on Task 212, Monkeys & Bananas, but the story shell is changed to make it natural to use your Poly Plug or other simple material to explore the challenge. The task requires little content background but has a deep iceberg which includes using a spreadsheet, finding patterns and creating algebra. We will explore all aspects and provide follow up information from Mathematics Centre about Poster Problems.

Keywords: Hands On/Maths by Inquiry
Not Repeated

G20  The Lost Logic Of Elementary Mathematics And The Haberdasher Who Kidnapped Kaizen
Jonathan Crabtree - VIC

Lecture  Years 3 to 8
The mathematician, René Thom, wrote: “There is no case in the history of mathematics where the mistake of one man has thrown the entire field on the wrong track.” Thom was wrong. He hadn’t heard about Henry. Strangely, the maths lessons children need have been missing for centuries. If an ancient Chinese, or Indian mathematician, were alive today, she would say we don’t understand mathematics. The reason is simple. Our lessons are derived from Greek mathematics, which had neither zero, nor negative numbers. So discover how simple mathematics could have been; if it hadn’t been for Henry the haberdasher!

Keywords: Number
Repeated as C18

G21  Creating Engaging Activities Using Origami
Ming Gao - Wellington Secondary College, VIC
Jan Mann - Wellington Secondary College, VIC

Workshop  Years 3 to 11
We have been using paper folding/origami in teaching Measurement and Geometry. They are hands-on, engaging activities that help students name shapes, build 2Ds and 3Ds shapes, develop their spatial abilities and improve their creativity. We also use paper folding to make parabolas, hyperbolas and ellipses in senior classes. We would like to have an opportunity to share our experience with other Maths teachers.

Keywords: Algebra/Geometry/Hands On
Repeated as H17

G22  Mathspace: Personalised Learning For The New Victorian Curriculum
Megan Blanch - Mathspace, VIC
Ash Breen - Mathspace, VIC

Lecture  Years 3 to 12
As teachers we know that learning could be so much more successful if we could truly tailor and differentiate what we do in the classroom - but who has the time? In this workshop see how Mathspace can be used to create a learning environment for students that enables them to learn mathematics at their own pace, step by step with feedback and scaffolding to support their development of mathematical reasoning. With extensive data capture and reporting, Mathspace allows teachers to target their teaching, increasing one-to-one teacher-student time, catering for individual differences and achieving overall improved student outcomes.

Keywords: Assessment/Differentiation
Not Repeated

G23  Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview
Craig Bauling - Wolfram Research, USA

Lecture  Years 4 to 12
Commercial Presentation
The Victoria Department of Education is supplying to all public and private schools the complete Wolfram tools suite including:

- Mathematica for higher secondary explorations,
- Mathematica Online for iPads and Tablets,
- Wolfram/Alpha Pro for cross discipline exploration,
- Wolfram Programming Lab for introductory coding and Algorithm explorations, and
- Wolfram SystemModeler for visual modelling and simulation.

Join Craig Bauling as he presents an overview of these tools and details on how to gain access for you and your students.

Keywords: STEM/Technology
Repeated as E24

G24  Formative Assessment For The Transition From Year 6 To Year 7
Pauline Rogers - ACER, VIC
Jim Spittal - ACER, VIC

Lecture  Years 5 to 8
The first step in planning a lesson sequence is to know what students can or cannot do. Year 7 students are mostly new to a school and come from a variety of Year 6 feeder schools. The presentation will describe what we learned from a small project designed to assist Year 7 teachers with formative assessment activities/lessons that might reveal where students are at in their understanding of important mathematical concepts. The focus is on fractions, capacity, geometric transformations and data analysis.

Keywords: Assessment
Repeated as D19
G25  Whadda We Hafta Do This For?  
Peter Sanders - La Trobe University, VIC  
Workshop  
Years 5 to 8  
Whadda we hafta do this for? A common lament amongst middle years' students about algebra. Leap Frog, is a multi-layered cooperative problem solving activity that gets to the heart of algebraic thinking. On one level, a fun, engaging problem, involving exploration of pattern – undertaken successfully by the presenter with children as young as 8/9 - as the problem develops, deeper mathematical understandings emerge which lead to a rationale for algebraic generalisations – ideal for convincing lower secondary students that algebra is indeed worth doing! Warning – you will be deeply engaged in this session, solving Leap Frog!  
Keywords: Algebra/Hands On  
Repeated as B23

G26  Teacher Teams Transforming Mathematics - Scoresby Secondary College Experience  
Leanne Wilson - Scoresby Secondary College, VIC  
Emma Morris - Scoresby Secondary College, VIC  
Workshop  
Years 5 to 9  
Leanne and Emma have designed and implemented a high quality teaching program that is inspiring student motivation, engagement and learning. The program is based on a guaranteed and viable curriculum that has been successfully differentiated to meet the needs of individuals and groups of students. Their classes are delivered as a team to Year 7 classes in purposeful spaces. The workshop will include some current theory, demonstration of planning documents and an opportunity for teachers to use resources that are available for free on the internet in many cases. There will be samples of pretesting pre-assessments, developing conceptual understanding through hands-on material, games and investigations and more. Guaranteed to be enjoyable and participants will gain knowledge of processes and resources that they will use in class the next lesson.  
Keywords: Assessment/Differentiation  
Repeated as C26

G27  SMART Tests, Smart Teaching, Smarter Students  
Sara McKee - Springside P-9 College, VIC  
Dr Max Stephens - The University of Melbourne, VIC  
Workshop  
Years 5 to 9  
Springside P-9 College has been using SMART (Specific Mathematics Assessments that Reveal Thinking) assessments since 2014 in Years 5-9. SMART tests are online diagnostic assessments developed by The University of Melbourne to assist teachers in identifying student understanding and revealing student misconceptions. Over the past year, 10 teachers have regularly used the SMART tests to complement their in-class assessments. Most importantly, SMART tests have enabled our teachers to be more confident about planning and teaching mathematical content appropriate to their year level, to identify student misconceptions and how to move students forward in regular class settings.  
Notes: Please bring a laptop.  
Keywords: Assessment  
Repeated as A27

G28  Scaffolding Statistics Understanding In The Middle School  
Professor Jane Watson - University of Tasmania, TAS  
Lecture  
Years 5 to 10  
The Reforming Mathematical Futures 2 Project (RMIT and AAMT) is building a learning and teaching resource to enhance mathematical reasoning in Years 7 to 10. One of the focus content areas is Statistics. Based on the results of survey items completed by students in the project schools across Australia, tasks and scaffolding strategies will be suggested to improve student understanding across the years and to prepare for further study in Years 11 and 12. The session is intended to be interactive with participants solving problems and giving feedback on the strategies suggested.  
Keywords: Probability & Statistics  
Repeated as E26

G29  My Students Don’t Know Their Tables!  
Norrian Rundle - Retired Teacher, VIC  
Michael O’Reilly - Retired Teacher, VIC  
Workshop  
Years 5 to 10  
Too many students in the Middle Years do not have automatic recall or even efficient strategies to work out the Multiplication Facts. While they have been taught strategies to calculate their Multiplication Facts, they mostly resort to counting on their fingers, using the ‘tables’ on the back of their exercise book or calculators. This workshop will look at an alternate representation of the ‘times tables’, with associated efficient strategies for learning the Multiplication Facts. In this option you will be shown how to effectively teach the Multiplication Facts to Middle Years students who do have automatic recall.  
Notes: Bring along a USB stick for resources.  
Keywords: Number  
Repeated as D24

G30  Collaborative/Social Learning: Today’s Student Pathway  
Alan Power - MathsRepublic, VIC  
Lecture  
Years 5 to 12  
This workshop will explain the difference between differentiation and modification and support delegates to effectively differentiate mathematical learning using content, strategies, process and classroom layout. Delegates will leave the session with a clear understanding of what and how to differentiate, as well as a tool box of ideas on how to effectively cater for all learning needs, abilities and learning styles in their mathematics classroom.  
Keywords: Differentiation  
Repeated as E30

G31  Differentiation Versus Modification - How Do I Effectively Differentiate For All Learning Needs And Styles?  
Elizabeth Lonergan - Beth Rivkah Ladies College, VIC  
Workshop  
Years 6 to 10  
This workshop will explain the difference between differentiation and modification and support delegates to effectively differentiate mathematical learning using content, strategies, process and classroom layout. Delegates will leave the session with a clear understanding of what and how to differentiate, as well as a tool box of ideas on how to effectively cater for all learning needs, abilities and learning styles in their mathematics classroom.  
Keywords: Differentiation  
Repeated as E30

G32  Made By Maths Al La Trobe  
Dr Katherine Seaton - La Trobe University, VIC  
Workshop  
Years 7 to 8  
One of the free walks in the Made by Maths app of the MAV is a tour of La Trobe University. Join the author of the walk for a taste of the app, and enjoy some maths, architecture and sculpture.  
Notes: Download the walk onto a device such as iPad, tablet or smartphone prior to the conference.  
Keywords: Student Activities  
Repeated as B29

G33  Using Technology To Teach Geometry In A Local (Shanghai) International School  
Su Yin Tye - World Foreign Language Academy, Shanghai  
Lecture  
Years 7 to 9  
The Chinese curriculum has always placed a strong emphasis on proofs of geometry. To integrate the Middle Years Programme (International Baccalaureate) Mathematics Criteria D (Applying mathematics in real-life contexts) with the Shanghai local syllabus, we will show how we introduced a theoretical circle property via a real-life situation.  
Keywords: Geometry/Technology  
Not Repeated
G34 21st Century Problem Solvers
Rhianon Lowrey - Flinders Christian Community College, VIC
Workshop  Years 7 to 9
What does a problem solver look like in a 21st century classroom? Find out some strategies, new and tried and true
that will help you to what is a problem solver and what are educators doing to support thinkers.
Keywords: Maths by Inquiry/Problem Solving
Repeated as B31

G35 Pythagoras
Anthony Harradine - Potts-Baker Institute, Prince Alfred College, SA
Workshop  Years 7 to 10
The theorem of Pythagoras is one of the staples. This workshop will engage you in a way of introducing it and
extending it that you will most likely not have seen before. Students are presented with a very simple set of
manipulatives (paper) and a simple task allows them to reveal so very nice results. Tried and proven, low entry
point, as high an exit point as you desire.
Notes: Please bring, paper, pencil, calculator of your choice of device.
Keywords: Geometry/Measurement
Repeated as B33

G36 Pokies And Responsible Gambling
Dr Ian Lowe - The Mathematical Association of Victoria, VIC
Computer Workshop  Years 7 to 10
Ian Lowe and other MAV members have completed a successful research project at Year 9 demonstrating that good
teaching about probability using gambling-related contexts can make a considerable difference to the knowledge
and attitudes of students who formerly believed in luck or that they had some control over the outcomes of poker
machines. In this option teachers will experience some of the activities that led to this and be invited to use the
resulting materials in their classrooms.
Keywords: Hands On/Probability & Statistics
Repeated as J24

G37 How Far Can A Differentiated Learning Program Go?
Jenny Sutton - Lavalla Catholic College, VIC
Deborah Murrell - Lavalla Catholic College, VIC
Lecture  Years 7 to 10
The idea of offering a differentiated learning program sounds commendable, but is it actually possible? In 2014
Lavalla Catholic College introduced the Maths Pathway learning model which allowed teachers to know the
talents, skills, deficiencies and weaknesses in Mathematics of their students. However, the change to teaching
practice required for teachers to deliver a totally differentiated Mathematics program was initially underestimated.
Jenny Sutton and Deborah Murrell will discuss their experience of the change required of teachers and schools to
implement a differentiated program such as Maths Pathway and share a vision of a community of Maths Pathway
teachers who collaborate in creating differentiated rich lessons.
Keywords: Differentiation
Repeated as B34

G38 Fostering Student Engagement In A Networked Classroom
Thomas Yeoh - Texas Instruments, Singapore
Workshop  Years 7 to 10
In a typical classroom, it is common to see some students who are disengaged from the lesson, and often these
students lack the motivation or desire to participate in the Mathematics lesson. In this presentation, the presenter
will share his experience in using the TI-Nspire Navigator System in the Singapore Mathematics classroom to
improve on student engagement and understanding of concepts through some questioning techniques used with
the technology. Topics shared include functions and graphs, polynomials and statistics.
Notes: Please bring a TI-Nspire CX or CX CAS if you have one.
Keywords: Technology
Not Repeated

G39 Examview 101: Build A Sustainable Assessment Environment
John Meng - Rooty Hill High School/MANSW, NSW
Lecture  Years 7 to 12
This workshop aims to introduce teachers an effective tool, ExamView, to frequently assess, track, and analyse
student comprehension of the subject content taught. In this hands-on workshop John will demonstrate how to
effortlessly create study guides, quizzes and tests from the ExamView question banks. In addition, all the participants
will learn how to instantly generate a wide range of assessment result analytics through ExamView Test Manager,
which will be used to guide future teaching.
Notes: Bring your own laptop or mobile device to the workshop.
Keywords: Assessment
Repeated as D36

G40 Maths Activities For Students With Special Needs
Leigh Thompson - Bainsdale Secondary College, VIC
Gareth Jones - Victoria University, VIC
Workshop  Years 7 to 12
As part of the Victorian Government Special Needs Plan, teachers are required to build their capacity to teach
learners with disability. This workshop aims to provide a few activities that should meet some of the specific learning
needs of students across a range of abilities. Maths teaching activities that support the learning and participation
of learners with disability will be explored. The activities and teaching strategies aim to cater for a wide range of
abilities and recognise that all children can learn.
Notes: Pen, paper and ruler may be useful.
Keywords: Learning Needs
Repeated as H33

G41 Geometric Constructions Using Ti-Nspire
Mehmet Akif Altundal - Amity College, NSW
Lecture  Years 7 to 12
In this session we’ll construct simple shapes such as a midpoint, isoscles triangle, an equilateral triangle, a square
in the geometry section of TI-Nspire. Also we’ll do some challenging constructions by using limited tools in the
menus.
Notes: Please bring your TI Calculator to this session.
Keywords: Geometry/Technology
Not Repeated

G42 Data - Making Mathematics Real
Peter Fox - Texas Instruments, VIC
Lecture  Years 7 to 12
What do Monopoly™ and the Stratosphere have in common? Like many other opportunities and environments
they provide a wealth of data that help engage students. Mathematical concepts and skills developed by exploring
property values on a Monopoly board easily extrapolate to real estate prices in most cities. Shifting from the
horizontal plane to a vertical one, how do temperature and pressure really change with altitude? The stratosphere
is more accessible than ever before. Finally, we’ll explore how to generate data applicable to sampling distributions,
something for everyone!
Keywords: Probability & Statistics/Technology
Not Repeated

G43 Teaching Mathematics In The Digital Age
Phillip Sakeilaridis - St Francis Xavier College
Lecture  Years 7 to 12
Teaching mathematics in a growing and evolving digital environment is becoming increasingly challenging. Having
the right mix of traditional methodology paired with innovative teaching styles can for many seem like an impossible
feat. Then we have to deliver the content in a way that caters for our young learners. This session will provide
participants real examples of how the use of software like Microsoft OneNote can be used to teach day to day, allow
assessment to be distributed, give students the opportunity to have a collaboration space with their teachers to ask
questions. Delivering valuable insight in how to use CAS calculators can be used in effective ways where students
can understand not only the access to menus but recall screen outputs.
Keywords: Technology
Repeated as C34
G44 A Guide To Cambridge's Online Resources Powered By HOTmaths
VJ Gunawardana - Cambridge University Press, VIC

Lecture Years 7 to 12

Commercial Presentation

HOTmaths is Australia's premier online resource to teach and learn mathematics. Cambridge has loaded the new editions of the Essential Mathematics for the Australian/Victorian curriculum series (7-10), the new Cambridge Senior Maths for Australian Curriculum/VCE series (11-12) and Cambridge GOLD maths onto the HOTmaths platform. This workshop will highlight how these new titles have been integrated with HOTmaths and demonstrate how to navigate through all of these interactive resources. Learn how you can make the most of both the student resources and the Learning Management System for teachers. Whilst HOTmaths offers courses for Years F-10, this workshop will focus on secondary only.

Keywords: Online Learning
Repeated as D38

G45 Investigating A Mathematical Methods Unit 3 Application Task Using the TI-Nspire
Russell Brown - Educational Consultant, VIC

Workshop Years 10 to 11

This hands-on session will work through an application task that is similar to one recently published in Advice to Teachers. It will cover concepts from the areas of Functions and Differential Calculus using the TI-Nspire CAS functionality. It includes family of curves, simultaneous equations and smoothly joining curves. Worked solutions and TI-Nspire files will be available. TI-Nspire CAS handhelde will be required if required.

Notes: Bring your TI-Nspire CAS handheld.

Keywords: Technology
Not Repeated

G46 Nspired Mathematics Classroom
Bozena Graham - Wesley College, VIC

Workshop Years 10 to 12

Teaching with a CAS calculator brings a new dynamics to a Maths classroom. A range of class activities will be presented how to introduce new concepts, check students understanding and create a vibrant class discussion. From short ideas, through explorations and investigations, to assessment: how to encourage and motivate students with a range of mathematical abilities, improve their conceptual understanding and boost their confidence.

Notes: Please bring your TI-Nspire CAS calculator to collect the files. The session assumes that participants have at least basic to good skills in using TI-Nspire CAS.

Keywords: Technology
Not Repeated

G47 Understanding Finance - The General And Further Mathematics Courses
Robert Vermany - St Paul's Anglican Grammar School, VIC

Lecture Years 10 to 12

Knowledge and thorough understanding of relevant skills will help to maximise student success in the Financial Modelling core module in Further Mathematics 3&4. This lecture will explore a program from a focus on consumer mathematics in General Maths 1&2 to an expanded understanding of loans, investments and depreciation in Further Maths 3&4. This program, and this lecture, aims to develop student confidence and ability in skills and techniques applicable to them all; not just in exams, but in real life decisions. Application of the calculator's financial solver to the solution of several past examination questions will also be demonstrated.

Keywords: Number
Repeated as E47

G48 Picturing Relationships In Calculus
Alastair Lupton - Le Fevre High School, SA

Workshop Years 11 to 12

In Mathematical Methods, students should be "deducing the graph of the derivative function from the graph of a given function and deducing the graph of an anti-derivative function from the graph of a given function". More than just an assessable skill, a mental picture of this powerful relationship also underpins an understanding much of the work done in Calculus. This workshop will look at ways that this mental picture can be helped to develop in students, supported a little technology and some well posed questions.

Notes: Some technology that can graph a function and its derivative is desirable. Content will be presented with ClassPad and GeoGebra. ClassPads can be borrowed for the workshop.

Keywords: Algebra/Technology
Repeated as B50

G49 ClassPad For Further Mathematics
Charlie Watson - The Tuition Centre, WA

Lecture Years 11 to 12

This option will focus on efficient test and exam use of ClassPad by Year 12 Further Math students, with a backwards glance at preparatory work from Year 11 General. Participants will develop an awareness of key ClassPad skills that FM students should develop for use when solving mathematical problems and applying mathematical processes. Useful Activities, programs and functions will be demonstrated and shared. A reasonable working knowledge of ClassPad will be assumed in the session, but don't let that put you off - just come along, sit back and see what's possible.

Notes: You may choose to bring your own ClassPad calculator to this session, as only a few loan models available.

Keywords: Technology
Repeated as D48

G50 Linear Regression Analysis Using MS Excel: Simulation, Model Fitting, Diagnostics And Interpretation
Nasim Khan - St Mary MacKillop College, ACT

Computer Workshop Years 11 to 12

MS Excel's Data Analysis capabilities and Add-Ins will be used to demonstrate the concept of Least Squares Linear Regression Analysis. The idea of Least Squares Regression (LSR) will be demonstrated using simulations. LSR model will be fitted to a given data set and various Diagnostic Tests (including Residual Analysis) will be used to determine the adequacy of the model. We shall consider analysing two scenarios:
1) Both the dependent and independent variables are continuous;
2) The dependent variable is continuous but the independent variable is binary.

We will interpret the estimates of the slope parameter and its 95% confidence interval. We may also consider centering the independent variable around the mean/median to have a meaningful interpretation of the intercept parameter estimate.

Keywords: Technology
Repeated as C46

11:00am-1:20pm Session G-H (FRIDAY)

G-H1 The Robots Are Coming - Mathematics Through LEGO Mindstorms Robotics
Mark Gleeson - Lumen Christi Catholic Primary School, VIC

Workshop Years 5 to 8

This hands-on workshop will involve a presentation focussing on a student led initiative, funded by a grant and fundraising, to promote engagement and purpose in Mathematics through the use of robotics and coding using LEGO Mindstorms Robotics. Following this video - based presentation, participants will get the opportunity to explore the same mathematical principles our students identified using the software and pre-built robots. These include measurement, location, ratio, algebraic patterns, linear functions, estimation, problem solving and engaging practical use of arithmetic operations. Finally, participants will also share and explore their own ideas after experimentation.

Notes: I will be bringing laptops and LEGO Mindstorms Robots for exploration. No software/hardware required (unless you want to download the free software from a USB drive I will bring along).

Keywords: Hands On/Innovative Models/Technology
Not Repeated

G-H2 Getting Started With Lua And TI-Nspire: Create Your Own Powerful Documents For Learning
Stephen Arnold - Texas Instruments Australia, VIC

Workshop Years 5 to 12

Commercial Presentation

So you thought Lua was just for programmers? You might be surprised to learn just how accessible this powerful authoring tool can be. In this session, we offer a gentle introduction and all the means to continue your Lua journey if you like what you see.

Notes: Bring a laptop with TI-Nspire software.

Keywords: Coding
Not Repeated
Using Wolfram SystemModeler it is possible to develop mathematical models in a large variety of areas, including mechatronics, computational biology, and social science. This hands-on workshop will show you how you can use mathematical models as a powerful teaching tool. The workshop focuses on examples from physics, dealing with questions such as: How does the Magnus effect work? How will a bouncing ball change behaviour when gravity changes? What happens if you weigh too little when bungee jumping? What’s the ideal setup for a catapult? A brief overview of how this can be applied in a cross curriculum environment will also be given. You will also learn how to gain access to the software.

Keywords: Technology
Not Repeated

H3 reSolve: Maths By Inquiry For F-6
Bruce Ferrington - Australian Academy of Science, ACT
Kristen Trivet - Australian Academy of Science, ACT

Workshop Years F to 6
The reSolve: Maths By Inquiry is an exciting new project co-sponsored by the AAMT and the Australian Academy of Science, producing lessons and resources for teachers F-10. This workshop, presented by two of the resource writers, will highlight many hands-on and engaging activities that illustrate the philosophy and pedagogy behind bringing inquiry into the maths classroom. The workshop will focus on the three elements of the resolve protocol – to be purposeful; to be accessible yet challenging; and to promote a supportive knowledge-building community.

Notes: Please bring a spirit of inquiry with you.
Keywords: Maths by Inquiry
Repeated as D3
H8  Financial Numeracy In The New Victorian F-10 Curriculum  
Shane O'Connor - Victorian Curriculum and Assessment Authority, VIC  
Workshop  Years F to 10  
The Victorian Government is launching a new program that will support schools and teachers to implement the new Victorian F-10 Curriculum. The program will ensure that Victorian students are better equipped to deal with our changing world. Effective implementation of the new Victorian F-10 Curriculum is an important part of the Education State. Schools will elect to access one or more of the ten specialist programs according to their self-assessed needs and focus. Financial numeracy/literacy is one of these key programs. This presentation will unpack the details of this Education State initiative, and provide participants with strategies and resources to achieve the best possible outcomes for their schools and students.  
Keywords: Literacy/Number  
Repeated as J9

H9  Family Maths  
Helen Haralambous - The Mathematical Association of Victoria, VIC  
Workshop  Years F to 10  
Participants in this session will gain some tips for hosting a Family Maths night at their school. Practical logistical tips, tried and trusted resources and ideas for running a successful event will be explored.  
Keywords: Games/Innovative Models/Student Activities  
Repeated as B11

H10  Getting Bang For Your Buck; Teaching Concepts Not Procedures  
Yvonne Reilly - Sunshine College, VIC  
Jodie Parsons - Sunshine College, VIC  
Workshop  Years F to 12  
This session will examine the difference between teaching mathematical concepts and procedures and how we use this knowledge to maximise the time we have in the classroom. The session will also allow participants the opportunity to workshop some approaches to delivering conceptual understandings which are effective at generating student learning.  
Notes: Bring a USB or QR READER.  
Keywords: Innovative Models/Maths by Inquiry  
Repeated as B13

H11  Cool Ways To Teach Place Value For Years 1 To 3  
Ian Howard - Charles Sturt University, VIC  
Workshop  Years 1 to 3  
In this hands-on workshop you’ll learn why place value is so vital and how you can ensure that your students develop the basic concepts. You’ll learn about the five basic properties of our number system. A feature of the workshop will be the use of simple materials and games that are designed to help children master the big ideas of place value. They’ll also develop the skills to become a wizard at mental computation. If you’re looking for some new engaging ideas and approaches then this workshop is for you.  
Keywords: Games/Hands On/Number  
Repeated as D8

H12  Go Further With PAT Maths  
Pauline Rogers - ACER, VIC  
Lecture  Years 1 to 10  
A constant question for teachers is "Now that we have our student data, what is best to do next?" This presentation will bring you up to date with recent enhancements to ACER's PAT Maths materials, such as i) extension to Early Years against the existing common PAT scale; ii) the power and flexibility of online reporting; iii) the use of PAT testing to inform teaching and learning; iv) the richness of the PAT Resources Centre materials for deepening understanding of mathematics pedagogy. This all amounts to re-framing the teacher’s role as one of action research.  
Keywords: Assessment  
Repeated as E14

H13  Engaging Tools Activities And Games That Deepen Learning  
Michael Barrsow - St Dominic's Primary School, VIC  
Workshop  Years 3 to 6  
Games can be a great way to engage students, while practicing skills, mental computation or acquiring some new learning. Teachers attending this session will participate in a series of games and activities perfect for tools sessions. These games include a mastermind style game focused on place value, a reasoning activity using the four operations and a BODMAS challenge. Other activities are variations of popular games that have been adapted to deepen the mathematics involved or increase participation, including buzz, pacman and the four corners card game.  
Keywords: Games  
Not Repeated

H14  Maths Card Games For Years 3-8 - A Strategy For Basic Number Facts  
Richard Korbosky - Dualahn Ply Ltd, WA  
Workshop  Years 3 to 8  
Commercial Presentation  
Get students excited to learn, think and communicate mathematically by playing maths cards games: Times Table, Tenth Game, Hundredth Game, Fraction Games and the Relato Game which links fractions, decimals and percentage. The maths cards are enjoyable, challenging and adaptable to different student ability levels. See how you can get students to practice basic facts using a different strategy, focus on mathematical language, see the same concept represented in different ways and develop student’s flexible mathematics thinking. This session is for any teacher who has students who need a different strategy to practice their basic facts in a range of mathematics ideas.  
Keywords: Games  
Repeated as D14

H15  Geometry Through The Art Of Paper Folding  
Averil Lee - University of Otago, New Zealand  
Shona McRae - University of Otago, New Zealand  
Workshop  Years 3 to 9  
This workshop will provide a hands-on display of how the properties of geometrical shapes can be explored through the art of paper folding. Ten different shapes will be made with conversations and discussions ranging from what the shape is called to how can this shape help to prove the sum of the angles in a polygon. Every attendee will receive a CD with materials from the workshop. (This is a repeat workshop from 2013)  
Keywords: Geometry  
Repeated as I14

H16  Intentionally Engaging 2.0  
Greg Carroll - AMSI, VIC  
Lecture  Years 3 to 10  
Not all engaging tasks are good tasks, but many are. In this hopefully engaging session, with lots of activities to be taken away, we will look at what distinguishes a good task from a time filler. Bring a sense of fun and a desire to enjoy your teaching career. This session has a similar theme to the 2015 presentation but covers all new activities.  
Keywords: Hands On  
Repeated as C20

H17  Creating Engaging Activities Using Origami  
Ming Gao - Wellington Secondary College, VIC  
Jan Mann - Wellington Secondary College, VIC  
Workshop  Years 3 to 11  
We have been using paper folding/origami in teaching Measurement and Geometry. They are hands-on, engaging activities that help students name shapes, build 2Ds and 3Ds shapes, develop their spatial abilities and improve their creativity. We also use paper folding to make parabolas, hyperbolas and ellipses in senior classes. We would like to have an opportunity to share our experience with other Maths teachers.  
Keywords: Algebra/Geometry/Hands On  
Repeated as G21
H18  Pyramid Problem: Using A Collaborative Problem Solving Approach  
Jo Knox - Maths Development, New Zealand  
Workshop  
Years 4 to 8  
This workshop will engage participants in a fun, hands-on pyramid building task that will link with an algebraic problem for students from Years 4-8. Participants will become familiar with a 5 step approach to support whole class, mixed ability, collaborative problem solving.  
Keywords: Algebra/Hands On  
Not Repeated

H19  An Introduction To 3D Printing  
Nat Bradshaw - Lowther Hall Anglican Grammar, VIC  
Workshop  
Years 4 to 10  
3D Printing is an emerging technology which is recently become both affordable and sustainable for use in schools. This workshop will introduce participants to Tinkercad, an online platform for the development of 3D models which can then be printed. The workshop will also discuss different activities which can be related to the maths classroom.  
Notes: Please bring a laptop.  
Keywords: Technology  
Repeated as B19

H20  Calculus in Primary School - A Hands-on Workshop Using ICT  
Dena Reddan - St Therese School, VIC  
Steinninn Nitschke - St Therese School, VIC  
Ronald Dando - St Therese School, VIC  
Workshop  
Years 5 to 8  
The session will workshop the ‘Calculus for Kids’ program. The project, in partnership with University of Tasmania, was created to provide primary school students with an application based understanding of engineering mathematics, through ICT, and ultimately encourage students into the field of engineering. The aim of the project is to teach Year 5 & 6 primary school students the concept of integral calculus, through the use of real-world engineering problems and the mathematics software; MAPLE. The purpose of this workshop is to use the program and share how it combines real-world problem solving and ICT to engage students in complex engineering mathematics. The session will also provide evidence of improvement in student confidence and love of mathematics.  
Keywords: Algebra/STEM/Technology  
Not Repeated

H21  Algorithmic Thinking, Flow-charts And Coding In Transition Years  
Martin Buchholtz - Rowville Secondary College, VIC  
Lecture  
Years 5 to 8  
This session is aimed at upper primary to lower secondary year level teachers who have had no prior exposure to coding. Participants will be run through a selection of examples and activities addressing progression points VCMNA194, 221, 251, 254 and 282. Participants will be encouraged to code their own simple programs during the session using freely available web interfaces. Different options of representing algorithms will be discussed with regards to their suitability for given year levels; options include worded coding, flow-charts, pseudocode and language specific coding, i.e. Python. Participants will be provided with an electronic copy of the used example programs.  
Notes: Bring your own laptop - fully charged.  
Keywords: Coding  
Repeated as B22

H22  Strategies For Problem Solving  
Susie Groves - Deakin University, VIC  
Workshop  
Years 5 to 9  
While Problem Solving is identified as one of the four Proficiency strands in the Australian Curriculum, there is little evidence of the type of problem solving that was included in the Working Mathematically dimension of VELS. This workshop focuses on ways in which teachers can develop their students’ sense of mathematical inquiry through mathematical activities that focus on problem solving skills and strategies.  
Keywords: Maths by Inquiry  
Repeated as D22

H23  Using Maths Games On The iPad To Increase Student Engagement  
Alistair Shaw - Atikin College, VIC  
Workshop  
Years 5 to 10  
After becoming frustrated with my student’s inability to quickly identify their times tables and factors, I created a game for the iPhone and iPad called Numbia. It is free and available to download from the iTunes store. In this game students are required to quickly identify multiples of numbers to help build their score. During the session you will learn how you can use the game in your class room and the benefits of students improving their time tables and factor skills.  
Notes: Bring your iPad or iPhone. Download Numbia from the iTunes store.  
Keywords: Games/Technology  
Repeated as I20

H24  Numeracy Intervention That Works  
Michelle Anderson - Numurkah Secondary College, VIC  
Helen Barker - Numurkah Secondary College, VIC  
Commercial Presentation  
Years 5 to 11  
Here at Numurkah Secondary College we have seen growth of 0.7 years above the general population by engaging the Quicksmart Program within our school. QuickSmart aims to improve the numeracy of students who are not achieving their academic potential. Participating students may have varying levels of learning difficulties because of knowledge gaps, lack of practice, anxiety and low confidence. The QuickSmart program is a responsive small-group intervention that aims to decolonise (Quick) and efficient (Smart) strategy use. QuickSmart uses research-based instructional strategies to support the learning of persistently low-achieving middle school students so that they are more actively and successfully engaged in inclusive classroom settings.  
Keywords: Learning Needs  
Repeated as E27

H25  Not Quite The Illuminati  
Andrew Wrigley - Somerset College, QLD  
Wally Broder - Somerset College, QLD  
Workshop  
Years 5 to 12  
A hands-on and interactive discussion of our experience in setting up and running a sustainable School Mathematical Society. What worked, what didn’t and what is to come. All participants will receive a FREE gift!  
Keywords: Innovative Models/Leadership  
Repeated as B26

H26  Developing An Integrated Inquiry Based Curriculum For Year 7 STEM (Science, Technology & Mathematics)  
Eliza Longeran - Beth Rivkah Ladies College, VIC  
Lecture  
Years 7 to 9  
This presentation shares with delegates the why, what and how our College integrated a Science, Technology and Mathematics Program into one subject in Year 7. We will share insights from parents, teachers and students in reference to the program, the rationale, the curriculum, the achievements and the challenges. We will share how we have empowered our teachers and students to be critical reflective learners whilst achieving academic and social outcomes.  
Keywords: STEM  
Repeated as C31

H27  Are You Struggling To Engage Middle School Students In The Maths Classroom?  
Adam Kruger - Wesley College, VIC  
Scott Rumble - Parkdale Secondary College, VIC  
Workshop  
Years 7 to 10  
Students learn best when they are motivated to learn by seeing the value and importance of the information presented. This presentation will exhibit our ASAP, a student approach to learning. It is a 7-10 Secondary Mathematics program, which we developed at our college and are now working with a number of schools to implement this exciting approach to learning mathematics. Throughout the session we will demonstrate how we motivate students to learn, creating an interactive atmosphere to allow for student voice, build connections through directed assessments, provide opportunities to apply knowledge to real world situations, challenge and engage students through effective feedback strategies and work through using data as a tool to improve key numeracy skills of our students. By the end of the session, each attendee will walk away with engaging activities, strategies that they can use immediately in their classroom.  
Notes: Handouts will be supplied to all participants which will include ready to use materials for the Mathematics classroom.  
Keywords: Innovative Models  
Repeated as B32
H28  Coding In The Mathematics Classroom
Shelley Cross - St Hildas School, QLD
Workshop  Years 7 to 10
Coding, Maths and the TI-Nspire CAS APP! Did you know you can write code on graphics calculators? This hands-on workshop will examine the “10 minutes of code” principle. We will use the TI-Nspire CAS APP on the iPad to code some very basic programs in mathematics. You will be able to take away ideas ready to implement and use in your classroom with students from Years 7 to 10; no previous coding experience of any kind is required. Please bring your iPad with the TI-Nspire CAS APP installed. We will have a small number of iPads with the TI-Nspire CAS APP installed which can be borrowed if you do not have your own.
Notes: Please bring your iPad with the TI-Nspire CAS APP installed.
Keywords: Coding
Repeated as B36

H29  How To Teach Algebra To Secondary School Students
Peter Collins - Mordialloc College, VIC
Lecture  Years 7 to 10
Algebra is, and will remain, a large and important part of any secondary maths curriculum. From my observations over 26 years in Victorian State schools, it is a topic that causes an inordinate and unnecessary amount of sadness. This session is aimed at providing teachers with an approach / hints that the presenter has found to enable the maximum amount of learning with the minimum stress. The presenter has been teaching for 26 years. Most of his students / ex-students do not hate him. He has presented at MAV conferences before – feedback has been positive, and nobody much has walked out of his sessions. This session is basically an updated and improved version of a very positively received session I ran last year.
Keywords: Algebra

H30  Pearson Maths 2nd Edition - Coding, STEM And New Victorian Curriculum
Tim Carmuthers - Pearson, VIC
Catherine McKenzie - Pearson, VIC
Julian Lumb - Pearson, VIC
Computer Workshop  Years 7 to 10-10A
Commercial Presentation
See how to help save time and make your classroom teaching more effective, with the new features in Pearson Mathematics 2nd Edition. Automatic progress tracking and helpful formative assessment with Lightbook Starter. Algorithmic thinking and coding activities for the 2017 Victorian Curriculum. New STEM activities, rich exploration tasks, interactive, and content that is updated, revised and better differentiated for a range of student ability. Come along to see the new 2nd Edition for yourself, and bring your laptop to play with exciting new digital content.
Keywords: Coding
Not Repeated

H31  Dilating Proofs
Ray Cross - QLD
Workshop  Years 7 to 11
This workshop will use the TI-Nspire CX CAS calculator to explain constructing dynamic diagrams and interactive pages. The initial context is to facilitate a more comprehensive understanding of linear dilation transformations and polygon area. This then enables geometrical constructions for the exciting proofs: $a^2 = b^2 + c^2 ± bc$ for 60 deg and 120 deg triangles WITHOUT using the Theorem of Pythagoras or Cosine rule. An introduction to an innovative and instructive amalgamation of technology, geometry and trigonometry with potential for Years 7-11.
Notes: Please bring your TI-Nspire CX CAS calculator or laptop. Some calculators will be available.
Keywords: Geometry/Technology
Not Repeated

H32  A Pathway To VCE Algorithmics Units 3 & 4 (HESS)
Ivan Carlisle - Melbourne Girls Grammar, VIC
Lecture  Years 7 to 12
VCE Algorithmics is an exciting new opportunity for students in their final years of school. At Melbourne Girls Grammar we have been working towards the goal of offering VCE Algorithmics in 2017. Our journey has included: the establishment of the A.I. Network - a coaching opportunity for students engaged in computer science competitions; the integration of algorithmic approaches into our mathematics program; and, the establishment of a Year 10 Algorithmics elective. In this presentation I will: outline the pathway we have developed; discuss beneficial competition resources; and, consider some opportunities regarding Edgy, Python, and Wolfram as VCE Algorithmics programming languages.
Keywords: Algorithmics
Repeated as C32

H33  Maths Activities For Students With Special Needs
Leigh Thompson - Balmoral Secondary College, VIC
Gareth Jones - Victoria University, VIC
Workshop  Years 7 to 12
As part of the Victorian Government Special Needs Plan, teachers are required to build their capacity to teach learners with disability. This workshop aims to provide a few activities that should meet some of the specific learning needs of students across a range of abilities. Maths teaching activities that support the learning and participation of learners with disability will be explored. The activities and teaching strategies aim to cater for a wide range of abilities and recognise that all children can learn.
Notes: Pen, paper and ruler may be useful.
Keywords: Learning Needs
Repeated as G40

H34  Nspired To Flip
Melissa Hourigan - Narangba Valley State High School, QLD
Workshop  Years 7 to 12
Flipping your classroom can be a daunting process. I have used TI-Nspire CX calculators to enable me to flip my mathematics classroom. During this session I will show you how I have flipped my maths classroom and talk about the issues and successes that I have had.
Notes: Participants are encouraged to bring TI-Nspire calculators and laptops but it is not essential
Keywords: Technology
Repeated as I32

H35  Reasoning - How To Teach It Reasonably Well
Dr Paul Brown - Curtin University, WA
Lecture  Years 7 to 12
You will emerge from this session with some good resources for teaching mathematical reasoning, and perhaps with a clearer idea of what the curriculum intends by the word reasoning. Reasoning appears in the proficiency strand, but many teaching resources do not give it adequate attention and teachers may find it hard to assess. Paul has a considerable background as a secondary mathematics teacher, academic and author.
Keywords: Maths by Inquiry
Repeated as B40

H36  Mathematics - An Introduction To The Basics
Dr David Leigh-Lancaster - Victorian Curriculum Assessment Authority (VCAA), VIC
Linda Tilson - Mater Christi Belgrave, VIC
Computer Workshop  Years 7 to 12 & VCAL
This workshop provides an introduction for those with little or no previous familiarity with Mathematics. It will cover basics for numerical, graphical and symbolic computation. Participants will work through a collection of examples and activities related to the Year 7-12 mathematics curriculum. Practical aspects of classroom implementation and some related resources will also be discussed and shared.
Notes: Bring a USB to store sample files.
Keywords: Technology/VCAL
Repeated as B45
Imagine that you start at the mall of a large city and randomly select one of four possible walking directions to the next intersection. If you kept walking in this random way, would you get back to the mall? This workshop will look at questions from this year’s papers and discuss how useful applications of the CAS calculator could be recorded in the bound reference will be addressed. The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students. The session is open to Ti-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad.

Keywords: Probability & Statistics/Technology

H42 There Is An App For That!
Jim Lowe - QLD University of Technology, QLD
Workshop Years 10 to 12
Whether it is iOS, Android or even Windows there are Apps in existence for just about anything. This session will look at a few Apps that in addition to their intended function also provide useful information and data that we can use in the mathematics classroom. Data can be extracted from these and further investigations carried out using any of the technologies available in schools. The hands-on activities will make use of flight data that can be used to introduce some calculus concepts. Participants will learn how to use the Apps to obtain custom data for students or alternatively use the datasets and activities to be provided during this workshop.

Notes: Ti-Nspire technology used in the workshop, laptop helpful.

Keywords: Technology

H43 Further Maths Examinations 1 & 2: Advantageous Use Of The CAS Calculator
Kevin McMenamin - The Peninsula School, VIC
Workshop Years 10 to 12
This session will look at questions from this year’s papers and discuss how useful applications of the CAS calculator aided in finding many answers. The use of pre-programmed material and ways information assisting calculator functionality could be recorded in the bound reference will be addressed. The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students. The session is open to Ti-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad.

Notes: Bring along your own calculator. Some ClassPads will be available for loan.

Keywords: Technology

Repeats as D47

H44 The Senior Mathematics Class Can Be Fun Too
Lorna McClory - Stawton College, VIC
Lecture Years 10 to 12
Even with the time pressure of delivering a VCE subject it is still possible to teach using hands on activities and present activities that are fun and educational. I will share my experience of teaching Mathematical Methods and using items such as spaghetti and play doh to bring graphs alive.

Keywords: Hands On/Maths by Inquiry

Repeats as I47

H45 Mathematics Subjects At The Distance Education Centre Victoria
Neale Woods - Distance Education Centre Victoria
Georgia Gourou - Distance Education Centre Victoria
Bill Simmalavong - Distance Education Centre Victoria, VIC
Lecture Years 10 to 12
For over 100 years, the Distance Education Centre Victoria (DECV) has been providing students with the opportunity to further their education via distance learning. Over the last two years, DECV courses have undergone a major transformation to online curriculum delivery. Two mathematics teachers will share their experiences of writing online courses and will demonstrate the extensive range of mathematics courses available at DECV. The main focus of the presentation will be on VCE mathematics courses that allow students the opportunity to take subjects not offered at their own school.

Keywords: Online Learning

Not Repeated

H46 ClassPad For Mathematical Methods
Charlie Watson - The Tuition Centre, WA
Lecture Years 11 to 12
This option will focus on efficient test and exam use of ClassPad by Year 11 and 12 Methods students. Participants will develop an awareness of key ClassPad skills that MM students should develop for use when solving mathematical problems and applying mathematical processes. Useful eActivities, programs and functions will be demonstrated and shared. A reasonable working knowledge of ClassPad will be assumed in the session, but don’t let that put you off - just come along, sit back and see what’s possible.

Notes: You may choose to bring your own ClassPad calculator to this session, as only a few loan models available.

Keywords: Technology

Repeats as C44
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</tbody>
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I9  Rich Mathematical Tasks Using Dragon And Cat Data Cards
Dr Nicola Petty - Statistics Learning Centre, New Zealand
Workshop  Years 1 to 8
Commercial Presentation
Rich tasks enable students at all levels to engage in mathematical and statistical thinking. StatsLC is developing a range of data cards and resources involving dragons, cats and more. In this fun, hands-on workshop we will use StatsLC's Dragonicons data cards and Cat data cards in a number of statistical and mathematical tasks. Data cards can also be used in various games and activities developing skills in ordering, sorting and numeracy. The Dragon and Cat data cards are an exciting and inexpensive new product developed by StatsLC for use in classrooms from Year 1 up to Year 11.
Keywords: Probability & Statistics/Technology
Repeated as D9

I10  The Maths Enrichment Program (Real World Maths)
Shyam Drury - Scitech Discovery Centre, WA
Scott Hamilton - Portland Primary School, VIC
Lecture  Years 3 to 6
Scitech and Alcoa have created the Maths Enrichment Program which has been run successfully for four years throughout regional Western Australia and Portland Victoria. The program trains teachers of Year 4/5 students how to create and run context-driven, scenario-based maths projects that engage students by showing them the real-world relevance of the maths they are using. These rich tasks capture the interest and imagination of students as they allow them make choices, problem solve and create solutions using multi-modal representation. It also takes a very special approach to professional learning, running across a whole year, incorporating classroom support, review and feedback, and parent and community engagement. Shyam Drury, the coordinator of the program, and Scott Hamilton, a teacher who participated in the program this year, will share the success of this program as inspiration for teachers and professional learning agents in their approach.
Keywords: Gifted & Talented/Innovative Models/Maths by Inquiry/STEM/Student Activities
Not Repeated

I11  Teaching And Learning Multiplication Facts In A Meaningful Way
Justine Shelley - St Mary's Hampton, VIC
Natalie Biernan - St Mary's Hampton, VIC
Workshop  Years 3 to 7
Commercial Presentation
We are primary school teachers, with a passion for bringing 'times tables' into greater focus, in a more meaningful way. Through our experiences, we discovered the need for a multiplication program that was more than 'drill and practice' and memorisation. We decided to bring together our ideas, in an on-line resource which promotes conceptual understanding, mental strategies, practise and ultimately fast recall of the 121 multiplication facts. Through this approach, understandings flow into other key areas, such as division, multiplicative thinking and fractions. The resource we've created is called Mfacts121.
Notes: Bring your device (laptop or tablet) please.
Keywords: Number
Repeated as B16

I12  Differentiation In One Easy Lesson (!)
Jacinda Blencowe - AM51, VIC
Lecture  Years 3 to 8
We all know that there can be a wide range of abilities and attitudes towards maths in a single class. How do we cater to all these abilities in student learning? Differentiation is one answer. But what is differentiation, why does it work and most importantly, how can I do it in my classroom? Come and find out about differentiation; from the research base to classroom practice. And leave with some practical ideas and formats to try in your own classroom.
Keywords: Differentiation
Repeated as D13

I13  Obedience And Inequality OR Mathematics? Which Are You Teaching?
Dr Jude Ocean - RMIT University, VIC
Workshop  Years 3 to 8
‘Traditional’ mathematics education has a much stronger focus on producing obedience and compliance than it does on producing mathematical understanding. We will discuss these familiar maths classroom practices: silence, watchfulness, rules, and commands, and compare teaching graphing (bar graphs and line graphs) the traditional way and a different way, based on relationships, emotions and communication, which teaches for understanding. We will also look at how competition, testing, and streaming condition students for an acceptance of inequality. An example is drilling students in the Times Tables, and I’ll provide an effective way to teach the Tables that does not involve drilling, repetition and recitation. This session is intended to draw teachers’ attention to inadvertently working against democratic values when they teach mathematics using silence, watchfulness, rules, commands, competition, testing, and streaming.
Keywords: Innovative Models
Repeated as J13

I14  Geometry Through The Art Of Paper Folding
Averil Lee - University of Otago, New Zealand
Shona McRae - University of Otago, New Zealand
Workshop  Years 3 to 9
This workshop will provide a hands-on display of how the properties of geometrical shapes can be explored through the art of paper folding. Ten different shapes will be made with workshops and discussions ranging from what the shape is called to how can this shape help to prove the sum of the angles in a polygon. Every attendee will receive a CD with materials from the workshop. (This is a repeat workshop from 2013)
Keywords: Geometry
Repeated as H15

I15  Student Performance In The AMC
Adjunct Professor Mike Clapper - Australian Mathematics Trust
Lecture  Years 3 to 12
Over the last few years, the Australian Mathematics Trust has developed a sophisticated calibration mechanism for its AMC competition in order to ensure the appropriate level of accessibility and challenge in the competition. This has involved analysing the performance of many years of past competition questions which has revealed some fascinating insights into the questions that students can and can’t do. This presentation will provide teachers with a few surprise results from this analysis and some strategies for improving problem-solving performance.
Keywords: Problem Solving/Student Activities
Repeated as D16

I16  Computer Programming In Mathematics
Jan Honnens - Christ Church Grammar School, WA
Lecture  Years 3 to 12
The process of writing a computer program is very similar to the process of solving a mathematical problem, and computer programming has the potential to play a major role in the mathematics classroom by enabling students to mix the traditional mathematics curriculum with algorithmic and computational thinking. In this session we will look at how the computer programming languages Scratch and Python can be used to make the teaching and learning of mathematics more relevant, inspiring and challenging.
Keywords: Algorithmics/Coding
Not Repeated

I17  Using Big Ideas To Connect The Dots In Mathematics
Dave Tout - ACER, VIC
Jim Spithill - ACER, VIC
Lecture  Years 4 to 10
Big Ideas thinking helps teachers and students to see the connectedness in mathematics. Sometimes a top-down approach to thinking about curriculum works best. But faced with the reality of dot-pointed curriculum documents it is sometimes necessary to take a bottom-up approach. This presentation will look at some of the research around Big Ideas thinking, and give examples of how to employ it.
Keywords: Innovative Models
Repeated as E23
118  Sundials And Other Solar Instruments
Tim Byrne - VIC

Workshop  Years 5 to 8
We are given one day at a time to live, so our fundamental unit of time is arguably the day. We divide the day into 24 parts and further subdivide that into 60 parts and even further into 60 parts before becoming metric. Curiously, time is the only area which has largely resisted metrication, for reasons which are worth reflecting upon. In this workshop, participants make simple instruments without moving parts that have worked for millennia. This workshop helps participants create instruments which mark the passing hours and minutes; while also creating an instrument which monitors the apparent passage of the sun across the sky. Modifications for each location are explained. Participants will be invited to consider the possibilities of a metrification of time, namely, a sundial for a metric day. What would a sundial look like on another planet, like Mars where a sol is 24 hours and 37 minutes?

Keywords: Hands On/Measurement  Repeated as D20

119  An Intensive Intervention Program For Underachieving And Disengaged Year 8 Students
Focussing On Multiplicative Thinking, Motivation And Engagement
Oliver Lovell - The Melbourne Graduate School of Education, VIC
Dr Max Stephens - The University of Melbourne, VIC

Workshop  Years 5 to 9
This presentation will discuss teaching strategies and assessments used in a recent intensive intervention research program focussing on multiplicative thinking, motivation, and engagement. This research program worked with a total of 12 Year 8 students who had been identified by the school as low achieving and prone to disengagement. Intensive teaching took place in small groups for two 1 hour session per week over 15 weeks and focussed on multiplicative thinking and exploring strategies to strengthen students’ engagement, motivation, and resilience. Findings regarding the efficacy of the program will be reported.

Keywords: Assessment/Innovative Models/Multiplicative Thinking  Not Repeated

120  Using Maths Games On The iPad To Increase Student Engagement
Allister Shaw - Aitken College, VIC

Workshop  Years 5 to 10
After becoming frustrated with my student’s inability to quickly identify their times tables and factors, I created a game for the iPhone and iPad called Numbia. It is free and available to download from the iTunes store. In this game students are required to quickly identify multiples of numbers to help build their score. During the session you will learn how you can use the game in your class room and the benefits of students improving their time tables and factor skills.

Notes: Bring your iPad or iPhone. Download Numbia from the iTunes store.

Keywords: Games/Technology  Repeated as H23

121  Investigative Activities: Year 7 Australian Mathematics Curriculum
Roncolo Cirillo - Mathematical Association of Western Australia, WA

Workshop  Years 6 to 8
Commercial Presentation
Sample investigative activities suitable for use with students in Years 6-8, will be provided and discussed as indicative of what is available for purchase from the MAWA website. These are online resources available in editable digital form upon the purchase of a school site licence. Each activity comes with teacher notes indicating the dots points covered by the activity and the proficiencies that are addressed plus, solutions and a student handout of the activity. Participants will have opportunity to see the range of activities available within a bank of 120 activities covering all content areas of the Year 7 curriculum. While the session may be considered ‘commercial’ as it will be showcasing materials available for purchase, the focus of the session will be on delivery of the Year 7 content and proficiencies.

Keywords: Assessment/Games/Hands On/ Maths by Inquiry  Repeated as C29

122  Problem Solving Literacy, Pedagogy And Strategies
Kelly Gallivan - St Kevin’s College, VIC
Jessica Mount - Mentone Girls Grammar School, VIC
Shanna Rankin - St Kevin’s College, VIC

Workshop  Years 6 to 10
As a mathematics teacher, how often have you made the report comment that a particular student needs to improve their ability to accurately read and solve problems? This presentation presents pedagogy that can be used to integrate problem solving into any and every lesson. It will focus on how to teach problem solving strategies and how to build upon students’ language / literacy skills to decode worded problems.

Keywords: Literacy/Problem Solving  Repeated as E31

123  The Miniature Maths Book - A Student’s First Resort
Brett Van As - Mornbulk College, VIC

Workshop  Years 7 to 9
Rare is the student who will read the textbook for help. Do you find that board notes written in workbooks are largely ignored, if they can be found at all? The solution is the Miniature Maths Book, a reference that students love, can always find and will use, not just during the current topic, but even months after it has been taught. This is a practical idea that can be applied immediately to your classroom practice. In this session you will make one of these incredibly simple learning tools. Full written instructions will also be provided. Ideal for Years 7 to 9.

Keywords: Innovative Models/Literacy  Repeated as J23

124  Investing In Teachers: A System Plan
Catherine Smith - Catholic Education Office, NSW
Paul Stenning - Catholic Education Office, NSW

Lecture  Years 7 to 10
The creation of any new curriculum creates opportunities for teachers to review and evaluate their current practices and the achievements of their students with a view to improve learning opportunities. As noted by Peter Sullivan in Chapter 9 of the 2012 MERGA publication “Engaging the Australian National Curriculum: Mathematics - Perspectives from the Field”, the take up of these opportunities will largely depend on the type and nature of the support teachers are given. This session will explore the response by a system of schools to significantly invest in teacher learning using current research and best practices to drive the development of key initiatives.

Keywords: Leadership  Repeated as D28

125  Making Confident Maths Teachers
Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop  Years 7 to 10
We all know that most secondary schools have many teachers who are not trained to teach mathematics. Ian has been running an extensive program this year for just such teachers, covering content and pedagogy for Years 7 to 9, and therefore the curriculum from Years 4 to 10. Come, hear about it, sample some activities and resources.

Keywords: Hands On/Innovative Models  Not Repeated

126  An Introduction To Programming And Algorithmic Thinking With Python
Nat Bradshaw - Lowther Hall Anglican Grammar, VIC

Workshop  Years 7 to 10
A knowledge of programming and algorithmic thinking concepts can open many possibilities for problem solving activities in the classroom. The Python language is easy to use and runs on most operating systems making it an ideal platform to teach with. This workshop will introduce participants to introductory python syntax and provide a range of teaching materials and problems which can be taken back to the classroom.

Notes: Would participants please bring a laptop to the presentation.

Keywords: Coding  Repeated as J26
I27  How Teachers Use Education Perfect Maths To Save Themselves Time And Hassle
Clare Feeney - Education Perfect, NSW

Lecture  Years 7 to 10

Commercial Presentation

In this session, we'll go through specific strategies Maths teachers use to save time and hassle in the classroom, using Education Perfect. We'll look at how teachers can use the program to monitor student progress, provide quality feedback and support struggling students.

Keywords: Assessment
Repeated as B35

I28  Our Experiences Implementing Personalised Learning
Vicki Nation - Billanook College
David Kinnersley - Billanook College

Lecture  Years 7 to 10

We believe at Billanook College the ideal personalised learning program offers self-paced learning, a choice on how students learn and flexible modes of instruction. With the use of Mathspace, ongoing assessment, a new Learning Management System and investigation projects, we are now providing individual learning plans for Year 7 Mathematics. Students across all capabilities have shown increased engagement. We would like to share our successes and failures with you in the aim that you may choose to adopt a similar program. We will discuss the evidence of the benefits associated with this style of learning.

Keywords: Maths by Inquiry/Online Learning
Not Repeated

I29  Desmos For Pre-VCE Mathematics
Bryn Humbersone - Caulfield Grammar School, VIC
Chris McCarty - Caulfield Grammar School, VIC

Lecture  Years 7 to 10

Many know Desmos to be a highly usable graphing calculator, suitable for exploring functions at VCE-level Mathematics. However, it is so versatile that it can be used to help students understand almost any mathematical topic, providing useful real time feedback on learning for both teachers and students. In this talk we will demonstrate how we have used Desmos to teach Year 7-10 students, with a particular focus on the formative assessment and collaborative functionality available through Classroom Activities. No prior knowledge of Desmos is assumed.

Notes: Participants are encouraged to bring along a tablet or laptop.
Keywords: Technology
Not Repeated

I30  Re-Visioning Year 10: Student Ownership, Differentiation, And Rigour
Colin Stonier - John Monash Science School, VIC
Emily Breslin - John Monash Science School, VIC

Workshop  Years 7 to 11

- How can we design a course that allows all students to learn, regardless of their prior knowledge?
- How can we give effective, timely feedback to students and teachers, and use it to guide student learning?
- How can we provide students with the opportunity and skill set to manage their own learning?

Our Mathematics faculty used these questions to guide reform of our Year 10 classrooms. In this session, some of our teachers will share their process for setting up new courses, the products we developed, and our research into the effectiveness. Teachers will leave the session with sample units and strategies to implement similar models in their own classroom.

Keywords: Assessment/Maths by Inquiry/Differentiation/Innovative Models
Repeated as E38

I31  Mathematica and WolframAlpha, Coding And Functionality To Access Real-world Data
Ian Wilson - VIC

Computer Workshop  Years 7 to 12

Use the Wolfram language of Mathematica to access an astounding array of data to provide real-world contexts for mathematical activities. Use the language to obtain real data that can be used across all secondary years for activities in computation, statistics and graphical work. Reference will also be made to the Wolfram/Alpha computational knowledge engine and its use in the classroom.

Notes: Participants may choose to bring their own laptops with Mathematica software loaded.
Keywords: Coding/Technology
Repeated as D35

I32  Nspired To Flip
Melissa Hourigan - Narangba Valley State High School, QLD

Workshop  Years 7 to 12

Flipping your classroom can be a daunting process. I have used TI-Nspire CX calculators to enable me to flip my mathematics classroom. During this session I will show you how I have flipped my maths classroom and talk about the issues and successes that I have had.

Notes: Participants are encouraged to bring TI-Nspire calculators and laptops but it is not essential
Keywords: Technology
Repeated as H34

I33  Introduction To Programming Using TI-Nspire
Raymond Rozen - RMIT University, VIC
Tim Grabovszky - The Hutchins School, TAS

Workshop  Years 7 to 12

In this hands-on workshop, participants will be introduced to programming using TI-Nspire. This can be done using TI-Nspire handhelds, computer software or on the app for iPad. Programming, has become a critical skill for 21st century careers, so come along and learn how to create, save, and run programs, including input and output, using loops and conditional statements. No previous programming experience of any kind is required. TI-Nspire handhelds will be provided if you do not have your own.

Notes: Please bring along your TI-Nspire handheld, iPad or laptop.
Keywords: Technology
Repeated as J31

I34  Digital Resources For Mathematics Education
Ro Bairstow - King’s College, New Zealand

Lecture  Years 7 to 12

Ro will show how using digital resources he has created, including ebooks, apps, games and a content website for Years 7 to 12, has changed the way he teaches his classes and the way his students learn mathematics. All of these resources are free and available through The BestMaths Foundation at www.bestmaths.net. BestMaths is a registered NZ charity.

Keywords: Online Learning
Repeated as J32

I35  Collaborative Tasks For Learning And Assessing Mathematics
Sabine Partington - Carey Baptist Grammar School, VIC
Dr Wendy Taylor - Bentleigh Secondary College, VIC
Brent Jewell - Carey Baptist Grammar, VIC

Lecture  Years 7 to 12

Collaborative tasks and assessments have many benefits for student learning and play a key role in a balanced maths program, however they can also bring up some new challenges in the classroom. In this session we will unpack the benefits and also discuss how to address potential challenges. Sample tasks and projects from Years 7 to 12 will be run with the group and a bank of resources will be shared.

Keywords: Assessment
Repeated as B42

I36  How To Run A Bridge Building Competition
Peter McClive - Sacred Heart Girls' College, VIC

Lecture  Years 8 to 9

A bridge building competition extends the thinking of students in many ways. We have used it to explicitly teach teamwork, project management, leadership, craftsmanship and presentation skills, and introduce the engineering and design fields. We run an annual competition for Year 8 and 9 students from late Term 1 until the end of Term 2, with the winning team competing at Scienecworks in Term 3. This presentation will demonstrate how to run a low cost competition that involves the whole school, and participants will receive an updated file of resources and tips to enable them to run their own competitions.

Notes: Please bring a laptop to download the file of resources.
Keywords: Maths by Inquiry/Student Activities
Not Repeated
I37  Teaching Mathematics In The Light Of STEM
Karim Noura - Bayside P-12 College, VIC
Workshop  Years 8 to 12 & VCAL
In this presentation, teachers will share experiences of linking what to teach in the classroom to real life situations. We will address problem solving situations using various ideas and strategies in the light of science, technology, engineering and mathematics.
Keywords: Problem Solving/STEM/VCAL
Repeated as B47

I38  Probability And Sports Gambling
Robert Money - The Mathematical Association of Victoria, VIC
Lecture  Years 9 to 10
The Sports Betting Unit in MAV’s Year 9/10 Biggest Loser’ Gambling Project offers an engaging and timely way of covering the statistics and probability content of the Year 9/10 curriculum. Come along and see how the unit covers such tricky ideas as two stage sampling, with and without replacement. Try out some of the simulations and have a discussion about the place of such theme-based material in the curriculum.
Keywords: Probability & Statistics/Hands On
Repeated as H39

I39  Numeracy For Life: Improving Numeracy Learning Outcomes
Cherie Pickering - Unley High School, SA
Lecture  Years 9 to 11
Students in South Australia are required to achieve a C grade or better in one semester of Stage 1 Maths in Year 11. This is one of the compulsory components of the South Australian Certificate of Education (SACE). Failure to achieve a C grade or better means no SACE. Wind the clock back in time and consider: how many of our young people have failed Maths in the years preceding Year 11 and SACE … Years 8, 9 and 10? What can be done to change this growing phenomenon? At Unley High School, we’ve implemented personalised numeracy programs at Years 9 and 10, creating a pathway for those students most at risk of not achieving their SACE in Senior School. This presentation will provide delegates with a snapshot of our program, including how we identify students at risk, our pedagogical content and how it is designed to enable students to develop the skills they need to pass the compulsory SACE Maths component … but more importantly to be able to work and function successfully in life beyond school.
Keywords: Innovative Models
Repeated as B48

I40  Creating Lua Apps For Ti-Nspire Without Coding
Neale Woods - Distance Education Centre Victoria, VIC
Workshop  Years 9 to 11
The Ti-Nspire software contains a Lua script editor that allows the user to create applications that run on both the software and the handheld. The Geometry Expressions program allows the user to create these applications without actually writing any Lua code. In this session, participants will have the opportunity to learn the various tools available in the Geometry Expressions program and to try a variety of the applications created.
Notes: Participants are encouraged to bring their own Ti-Nspire CAS handheld but spare handhelds will be provided. Participants are also encouraged to bring their own laptops to the session so they can install a trial version of Geometry Expressions.
Keywords: Technology
Not Repeated

I41  A Forgotten Theory In Secondary School Mathematics – Polar Coordinates
Hoi Yuen Hilary Lai - Diocesan Boys’ School, Hong Kong
Workshop  Years 9 to 12
Mathematical theories are often used to relate two measurable quantities, like length and area, distance and intensity. Though direction is very common and easily measurable, it is often lacking in teachers’ attention. With the focus of STEM in recent years, it will be good to bring more this reality back into the class context. In this exploration, a guided study of microphone’s directional properties will be used to deliver concepts of polar coordinates and polar graphs. Besides, a trial of “guided failure” is used to trigger students’ reflection on the importance of error handling.
Keywords: STEM
Repeated as J37

I42  Mandelbrot And Multibrots
Brett Stephenson - Guildford Young College, TAS
Workshop  Years 10 to 12
The Mandelbrot set will be presented by starting with a drawing investigation involving modular arithmetic. This will then be extended to other Multibrot sets. An investigation of the points which are in each of the sets and those which are not in the different sets using complex number calculations will be investigated using a CASIO ClassPad. ClassPads will be available during the session although participants are encouraged to BYOD for the investigation.
Keywords: Technology
Not Repeated

I43  Great expectations – E(x) and e
Brian Lannen - Wodonga Institute of TAFE, VIC
Lecture  Years 10 to 12
Maths explorations just has to be the best MAV Conference theme yet! Apart from the fact that the presenter closely identifies with the number e (because it is so irrational), e is definitely explosive. Having mostly taught classes from Years 9 to 12 in recent years, I would like to discuss the importance of both E(x) and e as they apply to the Maths Methods course, but also demonstrate some favourite activities for introducing expected outcome (probability) and exponential functions that I have used with my Y9 & 10 classes.
Notes: Ti-Nspire CAS will be used for the modelling of some of these activities, though it is not essential for participants to bring their own device.
Keywords: Algebra/Probability & Statistics/Technology
Not Repeated

I44  Symbol Sense: From School To University
Caroline Bardini - The University of Melbourne, VIC
Robyn Pierce - The University of Melbourne, VIC
Lecture  Years 10 to 12
This session looks at the misuse, misinterpretation and misunderstandings of symbols potentially creating pitfalls for senior students. Results of research with first year university mathematics students suggest that despite their success in VCE Maths Methods many students are in particular confused by notation. E.g. ; they misuse the “=” sign; confuse “tan” and “arctan”; and struggle to recognise patterns in expressions such as difference of squares when different letters are used. In this session we track likely sources of such confusion and consider teaching strategies to promote mathematical thinking to underpin success at VCE and beyond.
Keywords: Learning Needs
Repeated as J38

I45  EAL In The Maths Classroom
Ewan Campbell - Essendon Keilor College, VIC
Richard Myddleton - Essendon Keilor College, VIC
Lecture  Years 10 to 12
As a Victorian Education is increasingly popular with International Students, many schools have an increasing number of students whose first language is not English. VCE Mathematics is often a popular choice for English as Another Language (EAL) students as it is assumed that the language requirement of this subject is low and that the base knowledge of incoming students is high. Ewan is a senior Maths teacher at Essendon Keilor College and Richard is the International Student Coordinator. They have worked together to explore language acquisition in the Maths classroom and develop strategies for improving student comprehension.
Keywords: Learning Needs
Repeated as J39

I46  VCE Algorithmics (Modelling And Solving Problems)
Georgia Gouros - Distance Education Centre Victoria, VIC
Lecture  Years 10 to 12
As a subject VCE Algorithmics introduces students to new ways of thinking about problem solving, building on the foundations of mathematics of the middle years of secondary education. This course gives students the opportunity to develop algorithms to solve problems, leading to a solution to the problem as an algorithm. They go on to develop skills of evaluation by comparing algorithmic solutions in terms of correctness and efficiency. Students doing Algorithmics have expressed that they felt empowered with new knowledge, confidence and skills when approaching unfamiliar problems and challenges. This session will focus on exploring the creation of correct and efficient solutions by sharing some of the activities used to engage a diverse and dispersed cohort of students.
Keywords: Algorithmics
Repeated as E45
2:20pm-4:40pm Session I-J (Friday)

I-J1  Making Worksheets Come Alive With Adobe Acrobat Pro?
Brian Chau - Adobe, VIC

Lecture  Years 4 to 12

Commercial Presentation
Acrobat Pro allows teachers to simply convert paper-based mathematics worksheets into interactive digital documents that can be completed via a laptop, tablet device or smart phone. With a bit of Java knowledge, these documents can become self-correcting and fully dynamic. Adobe Solution Consultant Brian Chau will show how easy it is to work with Adobe Acrobat Pro DC (https://acrobat.adobe.com/au/en/acrobat/acrobat-pro.html) which is part of the Adobe Creative Cloud suite of software now available in most Victorian schools.

Keywords: Technology  Not Repeated

I-J2  Using ‘Algebra Tiles’ To Teach Integers, Simplification, Expansion And Factorisation
Michael O’Reilly - Retired Teacher, VIC
Norrian Rundle - Retired Teacher, VIC

Workshop  Years 7 to 11

Commercial Presentation
This extended session is an introduction to ‘Algebra Tiles’. ‘Algebra Tiles’ are a hands-on teaching aid used to introduce and teach Middle Years students directed numbers and simplification, expansion & factorisation of algebraic terms. Teaching strategies will be explained throughout the session. We will also provide participants with the templates to cheaply make their own class sets of ‘algebra tiles’. We will be developing the ideas firstly with integers, and then moving on to algebraic simplification, expansion and then factorisation. The use of arrays with the algebra tiles build on the initial work with integers. [This is a repeat of the sessions we offered at the 2009 - 2014 MAV Annual Conferences.] It is planned that the presenters and the MAV will publish these materials in 2016.

Notes: Bring along a USB stick for take home resources.
Keywords: Algebra/Hands On  Not Repeated

I-J3  Algebra Experiences You Won’t Forget
Doug Williams - Mathematics Centre, VIC

Workshop  Years 7 to 12

In the context of learning to work like a mathematician we will explore two apparently disconnected problems - one in number and one in 3D space - which turn out to be linked by the algebraic beauty of natural, triangle, square and cube numbers. We will also discover connections between these special numbers which you may not know and we will discover that intersections and unions and proof by mathematical induction can make sense to the learner. But the most important discovery may be when we ask: Why is it that we are unlikely to forget these experiences?

Keywords: Algebra/Geometry/Hands On/Number  Not Repeated

3:40pm-4:40pm Session J (Friday)

J1  Challenging Tasks For The Early Years (Foundation - Year 2)
Nadine Walker - Benton Junior College, VIC
Lisa Cuming - Benton Junior College, VIC

Workshop  Years EY to 2

As part of the EPMC Challenging Tasks project, Benton Junior College has been developing ways to engage our Early Years students in complex and challenging mathematical learning tasks. This hands-on workshop will explore some of the tasks that have been successful with Foundation to Year 2 students. The workshop will involve lessons, lesson ideas, student videos and works samples.

Keywords: Maths by Inquiry/Problem Solving  Repeated as E1

J2  MAV - Maths Talent Quest (MTQ)
June Penny - MAV Council/Student Activities Committee, VIC
Frances Sidari - MAV Council/Student Activities Committee/Lakeview Senior College, VIC

Workshop  Years EY to 2

The Maths Talent Quest (MTQ) continues to be an important component of the MAV’s Student Activities program. Running for over 30 years, it involves students engaging in personally chosen ‘real life’ math investigations. The categories include all Primary and Secondary year levels and investigations may be performed by individuals, groups or classes. Certificates and prizes are awarded at a presentation ceremony and some investigations are selected to represent Victoria in the Asia Pacific MTQ. Interested in in the MTQ and how to incorporate it into your school/class program? Do you have a personal interest or have questions about running it at your school? Join us to discuss ideas, criteria and process and to view past investigation examples.

Keywords: Student Activities  Repeated as C1
J3  Moving Maths
Elise Mackie - Derindimut Primary School, VIC
Ben Kelso - Derindimut Primary School, VIC
Workshop  Years K to 1
Looking to excite and engage young students in early number concepts? This workshop will use a kinaesthetic approach to teaching maths and will aim to show how we can use physical movement to help students understand numbers from 0 to 20. We will be sharing how you can use games, and stories to engage young minds and develop a deep understanding of number in the early years, such as, sequencing and ‘trusting the count.’ The session will harness children’s natural love of movement and creative imagination to engage them in understanding what each number means.
Keywords: Games/Hands On/Literacy/Number
Repeated as I2

J4  TUNE ME IN, Short Sharp Maths Warm-Ups To Get Your Lessons Rolling
Tim Colman - Stonnington Primary School, VIC
Jono Schmidt - Stonnington Primary School, VIC
Workshop  Years K to 6
Do you want to engage and excite your students at the beginning of every Mathematics lesson? In this workshop participants will work through a series of hands-on practical short activities to implement at the beginning of their Mathematics lessons. The session will highlight simple and effective tuning in activities across P-6 in a mixed ability classroom. Join us in this interactive workshop! Dice games, card games and engaging picture books will be explored.
Keywords: Games/Hands On/Number/Student Activities
Repeated as E2

J5  Once A Day-Two Ways
Shane Calthorpe - St Catherine’s School, VIC
Lecture  Years F to 6
A two prong presentation, focusing on the research into problem solving and how this research can best be applied to a classroom learning situations. Trisha F and one - Corinda State High School, QLD Callum Waite - QLD Student from St Joseph’s College, QLD
Workshop Years F to 10
Looking to excite and engage young students in early number concepts? This workshop will use a kinaesthetic approach to teaching maths and will aim to show how we can use physical movement to help students understand numbers from 0 to 20. We will be sharing how you can use games, and stories to engage young minds and develop a deep understanding of number in the early years, such as, sequencing and ‘trusting the count.’ The session will harness children’s natural love of movement and creative imagination to engage them in understanding what each number means.
Keywords: Games/Hands On/Literacy/Number
Repeated as I2

J6  Immerged In Maths
Stephen Cadusch - Pyalong Primary School, VIC
Lecture  Years F to 6
I work at a rural school with a current enrolment of 36 students in three classes. In 2015 we changed the way we operate, with teachers working in subject areas rather than year level classes. I am the Mathematics teacher, teaching all three classes across seven year levels. Many teachers I have spoken to have expressed interest in what this could mean for their classrooms.
Keywords: Innovative Models
Repeated as D6

J7  Maths And Minecraft
David Shigrov - St Peter’s College, SA
Workshop  Years F to 8
Escaping Minecraft is as easy as escaping the sun! Good luck! Instead, embrace what exists and tap into the potential of what this digital space offers in the realm of coding and mathematics. This is not limited to Minecraft and will look more broadly at tools that could be utilised at various year levels and their links to the Australian Curriculum.
Notes: For those interested in following along and bookmarking pages, please bring your own laptop or device.
Keywords: Coding
Repeated as I5

J8  Waging War On Worksheets
Martin Holt - The Mathematical Association of Victoria, VIC
Workshop  Years F to 8
In this session, we will scrutinise worksheets and worksheet alternatives, considering what is known about the link between motivation and learning. What criteria might be used to assess the potential of a given resource? What are some of the ingredients of a vibrant maths lesson or unit? How might ‘good’ resources be utilised in short and long term planning in Maths? What does a balanced Maths curriculum look like in the context of your school environment? This session aims to draw upon the knowledge and expertise of its participants and will also provide a range of practical tools that can be implemented in the classroom.
Notes: Bring short and long term planning documentation. Bring two worksheets (one that you like and one that you don’t).
Keywords: Innovative Models
Repeated as I4

J9  Financial Numeracy In The New Victorian F-10 Curriculum
Shane O’Connor - Victorian Curriculum and Assessment Authority, VIC
Workshop  Years F to 10
The Victorian Government is launching a new program that will support schools and teachers to implement the new Victorian F-10 Curriculum. The program will ensure that Victorian students are better equipped to deal with our changing world. Effective implementation of the new Victorian F-10 Curriculum is an important part of the Education State. Schools will elect to access one or more of the ten specialist programs according to their self-assessed needs and focus. Financial numeracy/literacy is one of these key programs. This presentation will unpack the details of this Education State initiative, and provide participants with strategies and resources to achieve the best possible outcomes for their schools and students.
Keywords: Literacy/Number
Repeated as H8

J10  Creative Design With MATHOMAT And Snappies
John Lawton - Objective Learning Materials, VIC
Emma Waite - Corinda State High School, QLD
Callum Waite - QLD
Student from St Joseph’s College, QLD
Workshop  Years 1 to 6
Commercial Presentation
Snappies are imaginary creatures that can be made using a Mathomat template. Snappies ask students to use mathematics creatively, by developing geometric drawings that have personalities, and defining characteristics, drawn by modeling real life creatures. Callum Waite first started drawing Snappies when he was seven. Emma Waite teaches secondary school art and mathematics and helped Callum to develop the whole Snappy family. In this hands-on workshop, participants will use the Snappies instruction manual, recently published by OLM. Snappies have the ability to foster a love of mathematics, fine motor skills, spatial reasoning and a deeper understanding of shape property.
Keywords: Geometry
Not Repeated

J11  The Biggest Impediment To Student Growth. And How You Can Challenge It
Richard Wilson - Maths Pathway, VIC
Justin Matthys - Maths Pathway, VIC
Lecture  Years 1 to 12
“Sarah just doesn’t get maths”. “Jayden will be lucky if he passes the next test”. “I’ve got a really low class this year and there’s no point trying to push them”. What’s wrong with these statements? How do they impact student learning? And how can you work with staff to powerfully reflect on their practice and create real improvements in maths as a result? In this session, we will be bringing theory and practice together so that you can walk away with concrete ideas for challenging impediments to student growth and making impactful change in your team. The session is aimed at coaches, leading teachers and others who support the ongoing professional development of their staff.
Keywords: Leadership
Repeated as C13
J12  Grade 3/4s Developing Big Mathematical Ideas: Sharon’s Little Red Book  
Sharon Goldfinch - Brunswick South West Primary School, VIC  
Dr Gaye Williams - Deakin University, VIC  
Workshop  
Years 3 to 6  
Sharon’s little red book containing her notes and reflections whilst working with Gaye stimulated this presentation.  
It is very precious to Sharon and often makes Gaye smile as Sharon refers to it as an authority in discussions with  
other teachers. Gaye is astounded at what Sharon has achieved through this reflective process and will point to key  
features as Sharon shares her insights and surprises and their relevance across the curriculum. Sharon and Gaye  
will share their amazement as Sharon’s Grade 3/4 class excitedly developed ‘big mathematical ideas’. This session  
is a must for primary teachers considering changing their practice.  
Keywords: Innovative Models  
Repeated as E18

J13  Obedience And Inequality OR Mathematics? Which Are You Teaching?  
Dr Jude Ocean - RMIT University, VIC  
Workshop  
Years 3 to 8  
‘Traditional’ mathematics education has a much stronger focus on producing obedience and compliance than it  
does on producing mathematical understanding. We will discuss these familiar maths classroom practices: silence,  
watchfulness, rules, and commands, and compare teaching graphing (bar graphs and line graphs) the traditional  
way and a different way, based on relationships, emotions and communication, which teaches for understanding.  
We will also look at how competition, testing, and streaming condition students for an acceptance of inequality.  
An example is drilling students in the Times Tables, and I’ll provide an effective way to teach the Tables that does  
not involve drilling, repetition and recitation. This session is intended to draw teachers’ attention to inadvertently  
working against democratic values when they teach mathematics using silence, watchfulness, rules, commands,  
competition, testing, and streaming.  
Keywords: Innovative Models  
Repeated as I13

J14  There's A Lot More To Times Tables Than Meets The Eye  
Christine Lenghaus - Traralgon College, VIC  
Workshop  
Years 3 to 10  
Wouldn’t we all love our students to have their times tables at their fingertips, without a calculator? That doesn’t  
match the reality of my classroom. In this hands-on workshop, use the resources that I have developed, in a visual  
and kinaesthetic system for teaching multiplication and division, which goes beyond rote and is suitable for starting  
to teach these concepts through to completing the square. Understanding multiplication is essential as it is the  
foundation of nearly all secondary maths but very few of our students see the patterns in numbers, carry over into  
topics such as Algebra.  
Notes: All resources and templates will be uploaded to Box and the link given to participants.  
Keywords: Number  
Repeated as E19

J15  Engaging Games To Develop Skills, Confidence And Higher Order Thinking  
Andrew Lorimer-Derham - St Mary’s Primary School, VIC  
Workshop  
Commercial Presentation  
Years 3 to 10 & VCAL  
Ever heard the words “Maths is boring?” This session exists to prove otherwise. A hands-on workshop catering  
for all learning styles with a variety of engaging games. The Think Square is a dynamic teaching and learning tool  
designed to develop skills, confidence and higher order thinking in your students. Be inspired by creative activities  
you can use in your own classroom. This workshop is ideal for innovative mathematics teachers.  
Keywords: Games/VCAL  
Repeated as E21

J16  The Joy Of Informatics, From CAT To AIO And Beyond  
Jan Hornens - Christ Church Grammar School, WA  
Lecture  
Years 3 to 12  
Informatics is mathematics related to computer programming and includes topics such as algorithms, networks  
and logic. In this session we will work through some of the past questions from the Computational and Algorithmic  
Thinking (CAT) competition and the Australian Informatics Olympiad (AIO) to appreciate the relevance and elegance  
of this kind of modern mathematics. No programming experience is needed for the CAT competition whereas the  
AIO requires students to be able to write a computer program.  
Keywords: Coding  
Not Repeated

J17  Google “Maths” - Using Google Apps For Maths Learning And Teaching  
Mark Gleeson - Lumen Christi Catholic Primary School, VIC  
Workshop  
Years 4 to 8  
With the proliferation of Google Apps for Education in our schools, opportunities for making mathematics interactive,  
collaborative and accessible to both students and teachers are readily available. This interactive workshop (laptop/  
tablet and Google account recommended for full participation) explores how the Australian Mathematics Curriculum  
can be enhanced through the use of Google’s suite of apps. Examples of how Sheets (Excel alternative), Maps, and  
Forms can be used by teachers and students in your lessons will be presented (and explored by participants if they  
have internet access). Google account recommend for participation. You can still be an observer of possibilities if you  
do n’t have one.  
Notes: Bring your own laptop (tablet if Google apps installed on it will work for some examples but laptop  
recommended for all options, especially Maps).  
Keywords: Technology  
Not Repeated

J18  Using Concrete And Visual Representations For Conceptual Understanding Of Operations  
Involving Fractions  
Dr Heather McMaster - University of Sydney, NSW  
Workshop  
Years 5 to 7  
Fractions have multiple meanings and there are multiple ways in which fractions can be represented. This confusion  
impedes the progress of students in the middle years in their ability to conceptually understand and work with  
fractions symbolically. In this workshop, participants will discuss approaches to teaching common fractions in Years  
5-7 of the Australian Curriculum. The aim is for students to develop mental strategies for working with fractions by  
being able to “see them” in their heads.  
Notes: Bring your own laptop if possible.  
Keywords: Fractions/Number  
Repeated as E25

J19  Some Favourite Problems - Do Them, Share Them, And Teach With Them  
Giovanna Vardaro - Wesley College/Australian Maths Trust, VIC  
Bruce Henry - Australian Maths Trust, VIC  
Workshop  
Years 5 to 8  
A number of favourite problems will be presented. Participants can try them, discuss solutions and learn how to use  
them in the classroom. Feel free to bring a problem of your own to share.  
Keywords: Maths by Inquiry  
Repeated as B21

J20  Exploring Problem Solving Strategies In Maths - Teachers’ Starting Point  
Iqlal Hossain - The Grange P-12 College, VIC  
Fahmida Hossain - Scholarship Assessment Training (SAT), VIC  
Computer Workshop  
Years 5 to 8  
Without direction, the majority of students in upper primary and lower secondary students will fall back on ‘trial and  
error’. To become an efficient problem solver, we must explore the different strategies for problem solving. This  
session will cover in detail strategies to help develop good problem solving habits. Also, to provide teachers and  
their students with opportunities to develop their problem solving skills, a wide range of valuable resources and web  
references will be supplied.  
Keywords: Maths by Inquiry/Problem Solving  
Repeated as D18

J21  Teaching Statistics With Data Investigations And ‘Cool’ Tools  
Dr Dung Tran - Victoria University, VIC  
Dr Max Stephens - The University of Melbourne, VIC  
Lecture  
Years 5 to 10  
Data… data… data…. This session will explore what it means to teach and learn statistics through an investigative  
cycle focusing on data. We will explore the possibilities of students engaging with real data, using ‘cool’ tools such as  
Gapminder World and TuvaLabs and of teaching statistics with data. Participants will have opportunities to engage  
with exciting videos and use web-based tools for exploring data. Participants will be introduced to some free online  
data visualization tools as well as quality resources such as lesson plans and readings to use in classrooms.  
Notes: Please bring an iPad or laptop with you!  
Keywords: Probability & Statistics/Technology  
Repeated as D23
**J22** Cloud-based Planning, Tracking & Reporting For Easy Differentiation In Today’s Classrooms  
William Murray - Mentone Girls Secondary College, VIC  
Victoria Pichtet - Full Circle Education Pty Ltd, VIC  
**Lecture**  
**Commercial Presentation**  
The new cloud-based Classroom Organiser enables teachers to prepare a lesson plan for every topic set for the year and to track student progress against the set lesson plan. With separate login-ins for students, teachers and parents, the system enhances student self-paced learning and encourages students to work through various levels of achievement. The system helps teachers to differentiate to meet individual student needs. The system also enables extension students to work well ahead of their year level and teachers to monitor their progress. The planning and tracking is easy to set up and the Classroom Organiser can import or export data in standard formats to work in with existing school record systems.  
**Notes:** Please bring your own laptop with access to the internet.  
**Keywords:** Learning Needs/Technology  
**Repeated as E28**

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**J23** The Miniature Maths Book - A Student’s First Resort  
Brett Van As - Monbulk College, VIC  
**Workshop**  
**Years 7 to 9**  
Rare is the student who will read the textbook for help. Do you find that board notes written in workbooks are largely ignored, if they can be found at all? The solution is the Miniature Maths Book, a reference that students love, can find and will use, not just during the current topic, but even months after it has been taught. This is practical idea that can be applied immediately to your classroom practice. In this session you will make one of these incredibly simple learning tools. Full written instructions will also be provided. Ideal for Years 7 to 9.  
**Keywords:** Innovative Models/Literacy  
**Repeated as I23**

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**J24** Pokies And Responsible Gambling  
Dr Ian Lowe - The Mathematical Association of Victoria, VIC  
**Computer Workshop**  
**Years 7 to 10**  
Ian Lowe and other MAV members have completed a successful research project at Year 9 demonstrating that good teaching about probability using gambling-related contexts can make a considerable difference to the knowledge and attitudes of students who formerly believed in luck or that they had some control over the outcomes of poker machines. In this option teachers will experience some of the activities that led to this and be invited to use the resulting materials in their classrooms.  
**Keywords:** Hands On/Probability & Statistics  
**Repeated as G36**

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**J25** Maths In A Box - Developing Mathematical Modelling Skills  
Jim Lowe - QLD University of Technology, QLD  
**Workshop**  
**Years 7 to 10**  
Using origami folding techniques to create a series of paper boxes produces a dataset which students can use to develop mathematical models using an investigative approach. Using the measurement from the boxes, students investigate relationships between side length and volume which can then be modeled algebraically and graphically. Students will also gain experience using spreadsheet and graphing software. In this hands-on workshop participants will be involved in both the construction and modelling activities using the available technology to provide a focus for the discussion on how best to develop students' mathematical modelling skills.  
**Notes:** Ti-Nspire used during session but data can be entered on other technologies.  
**Keywords:** Problem Solving  
**Repeated as E34**

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**J26** An Introduction To Programming And Algorithmic Thinking With Python  
Nat Bradshaw - Lowther Hall Anglican Grammar, VIC  
**Workshop**  
**Years 7 to 10**  
A knowledge of programming and algorithmic thinking concepts can open many possibilities for problem solving activities in the classroom. The Python language is easy to use and runs on most operating systems making it an ideal platform to teach with. This workshop will introduce participants to introductory python syntax and provide a range of teaching materials and problems which can be taken back to the classroom.  
**Notes:** Would participants please bring a laptop to the presentation.  
**Keywords:** Coding  
**Repeated as J26**

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**J27** How To Teach Algebra To Secondary School Students  
Peter Collins - Morialta College, VIC  
**Lecture**  
**Years 7 to 10**  
Algebra is, and will remain, a large and important part of any secondary maths curriculum. From my observations over 26 years in Victorian State schools, it is a topic that causes an inordinate and unnecessary amount of sadness. This session is aimed at providing teachers with an approach / hints that the presenter has found to enable the maximum amount of learning with the minimum stress. The presenter has been teaching for 26 years. Most of his students / ex-students do not hate him. He has presented at MAV conferences before – feedback has been positive, and nobody much has walked out of his sessions. This session is basically an updated and improved version of a very positively received session I ran last year.  
**Keywords:** Algebra  
**Repeated as H29**

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**J28** Card Games  
Helen Haralambous - The Mathematical Association of Victoria, VIC  
**Lecture**  
**Years 7 to 10**  
In this workshop, participants will explore a number of card games that can be used in secondary classes. The session will explore various scenarios of how these games can be used in the classroom such as warm up activities, a means to enhance student understanding via a hands on game or to use as part of a school numeracy program.  
**Keywords:** Games/Hands On/Number  
**Not Repeated**

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**J29** Using Technology To Teach Statistics in Years 7 to 10  
Tobias Cooper - De La Salle College, NSW  
**Workshop**  
**Years 9 to 12**  
This session will focus on bringing Statistics alive with dynamic Statistics software. Real world data sets will be explored in a dynamic and interactive way. A variety of concepts in the Australian curriculum will be the foundation of the workshop. Participants will also see how to use formative assessment seamlessly in a lesson.  
**Keywords:** Probability/Statistics/Technology  
**Not Repeated**

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**J30** Proofs By Pictures  
Adjunct Professor Mike Clapper - Australian Mathematics Trust, VIC  
**Lecture**  
**Years 7 to 12**  
This presentation presents a number of interesting algebraic and geometric problems or theorems that can be solved or proved by a purely pictorial method. These pictures can often provide striking insights into the connections between different mathematical ideas.  
**Keywords:** Problem Solving  
**Repeated as E40**

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**J31** Introduction To Programming Using TI-Nspire  
Raymond Rozen - RMIT University, VIC  
Tim Grabovszky - The Hutchins School, TAS  
**Workshop**  
**Years 7 to 12**  
In this hands-on workshop participants will be introduced to programming using TI-Nspire. This can be done using TI-Nspire handhelds, computer software or on the app for iPad. Programming, has become a critical skill for 21st century careers, so come along and learn how to create, save, and run programs, including input and output, using loops and conditional statements. No previous programming experience of any kind is required. TI-Nspire handhelds will be provided if you do not have your own.  
**Notes:** Please bring along your TI-Nspire handheld, iPad or laptop.  
**Keywords:** Technology  
**Repeated as I33**

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**J32** Digital Resources For Mathematics Education  
Ro Bairstow - King's College, New Zealand  
**Lecture**  
**Years 7 to 12**  
Ro will show how using digital resources he has created, including ebooks, apps, games and a content website for Years 7 to 12, has changed the way he teaches his classes and the way his students learn mathematics. All of these resources are free and available through The BestMaths Foundation at www.bestmaths.net. BestMaths is a registered NZ charity.  
**Keywords:** Online Learning  
**Repeated as I34**
Keywords: STEM/Technology
Not Repeated

J34 Making Flipped Learning Work For Your Class
Ben Dennis - Terang College, VIC
Lecture Years 7 to 12 & VCAL
This session will share some practical maths activities in the light of STEM program (Science, Technology, Engineering & Maths).
Notes: Bring calculator & computer.
Keywords: STEM/VCAL
Repeated as D40

J36 Using Algorithms To Make Better Decisions
Kylie McColl - The University of Melbourne, VIC
Michael Kiley - The University of Melbourne, VIC
Workshop Years 8 to 12
This hands-on workshop demonstrates how to incorporate algorithms into your mathematics classroom. How do algorithms run our computers and our lives? These sample lessons will explain how they work, provide practical and engaging tasks and show students how to take advantage of them to make better decisions in their own lives.
Keywords: Coding
Repeated as D42

J37 A Forgotten Theory In Secondary School Mathematics - Polar Coordinates
Ho Yuen Hilary Lai - Diocesan Boys’ School, Hong Kong
Workshop Years 9 to 12
Mathematical theories are often used to relate two measurable quantities, like length and area, distance and intensity. Though direction is very common and easily measurable, it is often lacking in teachers’ attention. With the focus of STEM in recent years, it will be good to bring more this reality back into the class content. In this exploration, a guided study of microphone’s directional properties will be used to deliver concepts of polar coordinates and polar graphs. Besides, a trial of “guided failure” is used to trigger students’ reflection on the importance of error handling.
Keywords: STEM
Repeated as I41

J38 Symbol Sense: From School To University
Caroline Bardini - The University of Melbourne, VIC
Robyn Pierce - The University of Melbourne, VIC
Lecture Years 10 to 12
This session looks at the misuse, misinterpretation and misunderstandings of symbols potentially creating pitfalls for senior students. Results of research with first year university mathematics students suggest that despite their success in VCE Maths Methods many students are in particular confused by notation involving superscript “^” in, for example, ; they misuse the “=” sign; confuse “tan” and “arctan”; and struggle to recognise patterns in expressions such as difference of squares when different letters are used. In this session we track likely sources of such confusion and consider teaching strategies to promote mathematical thinking to underpin success at VCE and beyond.
Keywords: Learning Needs
Repeated as I44

J39 EAL In The Maths Classroom
Ewan Campbell - Essendon Keilor College, VIC
Richard Myddleton - Essendon Keilor College, VIC
Lecture Years 10 to 12
As a Victorian Education is increasingly popular with International Students, many schools have an increasing number of students whose first language is not English. VCE Mathematics is often a popular choice for English as Another Language (EAL) students as it is assumed that the language requirement of this subject is low and that the base knowledge of incoming students is high. Ewan is a senior Maths teacher at Essendon Keilor College and Richard is the International Student Coordinator. They have worked together to explore language acquisition in the Maths classroom and develop strategies for improving student comprehension.
Keywords: Learning Needs
Repeated as I45

J40 How Mathematical Modelling Can Help You Understand The World
Jan Brugård - Wolfram MathCore, Sweden
Lecture Years 10 to 12
Commercial Presentation
Using Wolfram SystemModeler it is possible to develop mathematical models in a large variety of areas, including mechatronics, computational biology, and social science. This presentation will illustrate how you can use a graphical environment like SystemModeler to easily create equations (DAE’s) in order to perform advanced simulations. Making it possible for students to study and understand realistic systems while getting an insight to how powerful mathematics can be. You will also learn how Victoria teachers and students can gain free access to the software.
Keywords: Technology
Repeated as D45

J41 Worthwhile CAS Calculator Use In This Year’s 2nd Methods Exam?
Kevin McMenamin - The Peninsula School, VIC
Workshop Years 10 to 12
Routine and clever use of the CAS calculator in past Methods 2 examinations has shown it to be advantageous and worth the time and effort in getting to know its workings. Generally, half of the multiple choice questions and many parts of the extended answer questions benefit from good calculator skills. This hands-on session will get you using the calculator to see just how helpful (or not) it was with this year’s questions. The most efficient methods will be presented and questions where the calculator should be avoided will be pointed out. The session is suitable for Ti-Nspire and ClassPad users and the Casio ClassPad will be the featured CAS.
Notes: Bring along your own ClassPad calculator. Some ClassPads will be available for loan.
Keywords: Technology
Repeated as C40

J42 How To Use The Notes Pages On The Ti-Nspire CAS CX Calculator!
Craig Browne - St Joseph’s College, VIC
Workshop Years 10 to 12
This workshop will focus on how to use the Notes Page application on the Ti-Nspire CX Calculator. If you use the calculator in Years 10, 11 or 12 and have not used it then this session may interest you. The use of notes pages can give an alternative in how to perform calculations in an efficient manner.
Notes: Please bring your own calculator with operating system updated to version 4.2. Laptops with the Ti-Nspire CAS CX Teacher software with operating system 4.2 will be even better.
Keywords: Technology
Repeated as C42
J43  Bisection Method & Newton’s Method
Brian Stokes - Monash University, Victoria

Lecture
In the current VCE Mathematics Study Design (2016-2018) for the subject Mathematical Methods, additional algebraic material has been added as follows: Numerical approximation of simple polynomial functions using the Bisection Method and numerical approximation of roots of cubic polynomial functions using Newton’s method. The purpose of this presentation is to discuss these two methods and to illustrate their application with examples.

Notes: Bring a CAS calculator.

Keywords: Algebra/Number
Repeated as I48

J44  Assessment: Investigative Tasks And Sample Examinations For The ACARA Senior School Mathematics Courses
Romolo Cirillo - Mathematical Association of Western Australia, WA

Workshop
Years 11 to 12

Commercial Presentation
Sample investigative tasks suitable for school based assessment in General Mathematics, Mathematical Methods and Specialist Mathematics, will be provided to participants as indicative of what is available for purchase from the MAWA website. These – and associated screen shots. While the session may be considered ‘commercial’ as it will be showcasing materials upon purchase on a school site licence. Both resources include examples of appropriate use of CAS calculators and associated screen shots. While the session may be considered ‘commercial’ as it will be showcasing materials available for purchase, the focus of the session will be on designing quality assessment tasks for the respective courses.

Keywords: Assessment
Repeated as B51

J45  VCAL Responsible Gambling Victoria Units
Jamie Gray - Peter Lalor Vocational College, VIC
Oliver Lovell - Sunshine College, VIC

Workshop
Years 11 to 12 & VCAL

This session will share three Units of VCAL numeracy focusing on the topic of Responsible Gambling. Developed in partnership between MAV, experienced VCAL numeracy teachers, and the Victorian Responsible Gambling Foundation, the engaging, hands-on activities/lesson plans shared in this session have been trialled in numerous VCAL numeracy classes around the State. Designed with the challenges of differentiation in the diverse VCAL classroom, and the large number of out of field teachers taking VCAL numeracy classes in mind, this session will be of high value to all those aiming to support the mathematical development of VCAL students.

Keywords: VCAL
Repeated as C48

Presenter Listing

Amie Albrecht – E11, G13
Ben Allen – C11, E12
Mehmet Akif Altundal – C33, G41
Felicity Ames – C8
Lauren Anderson – B9, G12
Michelle Anderson – E27, H24
Rodney Anderson – B44, C36
Marco Angelini – D-E3
Stephen Arnold – B-C6, G-H2
Peggy Ashton – B-C1
Rebecca Backman – B6, H6
Michael Bairstow – C15, H13
Ri Bairdow – I34, J32
Lei Bao – E16, G17
Caroline Bardini – I44, J38
Helen Barker – E27, H24
Laura Barker – B6, H6
Rohan Barry – I-J4
Gary Bass – C38
Craig Bauling – B-C4, E24, G23
Tom Beardsworth – B9, G12
Ian Berryman – I-J4
Natalie Biernack – B6, H11
Megan Blanch – B18, E20, G22
Jacinta Blencowe – D13, H2
Janette Bobis – F3
Patrice Bradly – C3, G2
Leicha Bragg – G9, H5
Ash Breen – B18, E20, G22
Greg Breese – B30, D27
Elin Bremell – E38, I30
Greta Brewin – B1, H1
Jean Briggs – D4, G8
Wally Brodar – B28, H25
Stephen Broderick – B37, J33
Jill Brown – F6
Paul Brown – B40, H35
Russell Brown – C47, D50, G45
Craig Browne – C42, J42
Jan Brugärd – D45, G34
Martin Bucholtz – B22, H21
Ian Bull – B28, C28
Aynur Bullut – E39
Cathy Bushell – C22
Allanna Butler – G7, H4
Tim Byrne – D20, H18
Stephen Cadusch – E6, J6
Geraldine Caleta – C3, G2
Shane Calthorpe – D6, J5
Ewan Campbell – I45, J39
Ivan Carlisle – C32, H32
Greg Carroll – C20, H16
Tim Caruthers – D30, H30
Danielle Carter – C15
Jan Cavanagh – D7, E8
Yew Fook Chan – C37, D43
Caitlin Chandler – C11, E12
Brian Chau – C12, H1, I-J
Romolo Cirillo – B51, C29, I21, J44
Mike Clapper – B-C2, D16, E40, I15, J30
Doug Clarke – F5
Peter Collins – H29, J27
Tim Colman – E2, J4
Tobias Cooper – B42, I29
Ellen Corovic – G2, G1
Mary Coupland – D-E3
Jonathan Crabtree – C18, G20
Linda Cranley – C19, D15
Ray Cross – B46, H31
Shelley Cross – B36, H28
Lisa Cuming – E1, J1
Ronald Dando – H20
Cathy Davidson – G15
Chris Daxecker – B14, G18
Lorraine Day – B24, C27
Shane Dempsey – C35, D37
Ben Dennis – J44
Jenny Dockeary – G15
Ann Downton – G16
Shyma Drury – E15, I10
David Dustan – D5
Ken Ellis – B27, D26
Michaela Epstein – B-C5
John Eiskander – B14, G18
Rhonda Faragher – F2
Clare Feeney – B35, I27
Bruce Ferrington – B10, C10, D3, H3
John Fitzherbert – I-J5
Peter Flynn – I9
Peter Fox – C35, D37, E41, G42
Felicity Furey – D29, E33
Kelly Gallivan – E31, I22
Ming Gao – G21, H17
Ann Gerasimenko – A3
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Sharon Goldfinch – E18, J12
Georgia Gourou – E45, H45, I46
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Chris Greene – B6, H6
Terri Gregoritski – I-J4
Susie Groves – C8, D22, H22
VJ Gunawardana – D38, G44
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Pam Hammond – C16, D11
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Iqbal Hossain – D18, J20
Melissa Hourigan – H34, I32
Ian Howard – D-G18, H11, I7
Brent Hughes – B2, E5
Bryn Humbersone – C43, I29
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