MATHS

eˣPLOSION 2016

STEM

**THE MAV 53ʀᴅ ANNUAL CONFERENCE**

1 & 2 December 2016  //  La Trobe University, Bundoora

**www.mav.vic.edu.au**

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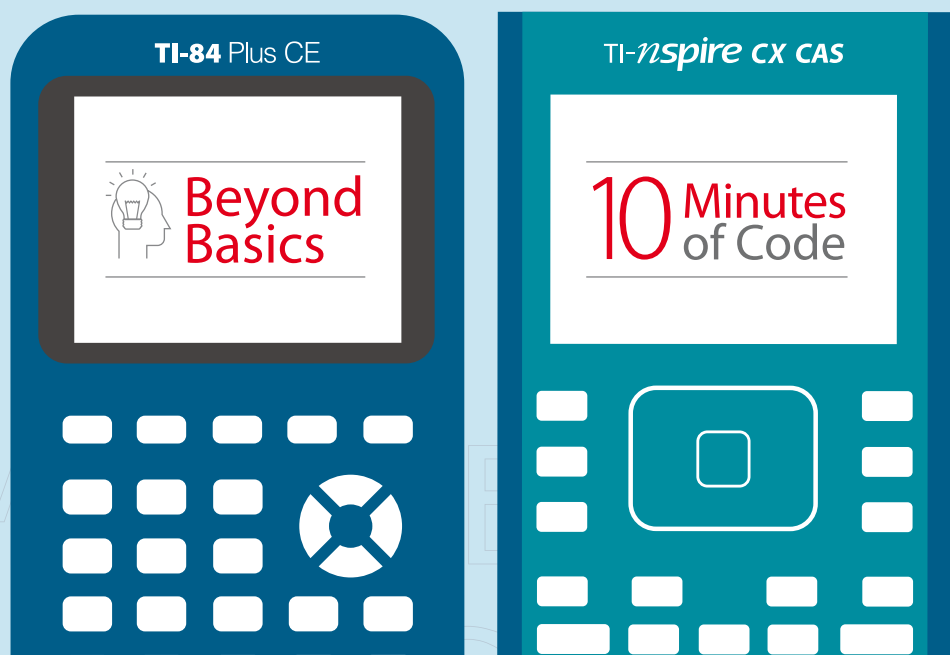*INSPIRED BY AUSTRALIAN TEACHERS*
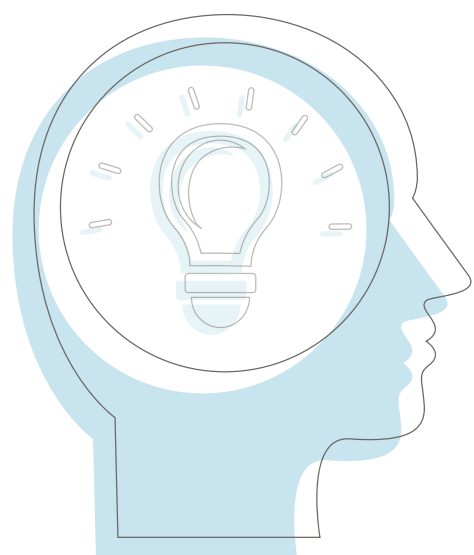*FOR AUSTRALIAN STUDENTS*

## CONTENTS — PAGES

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

## 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.

**TEXAS INSTRUMENTS**

# 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.
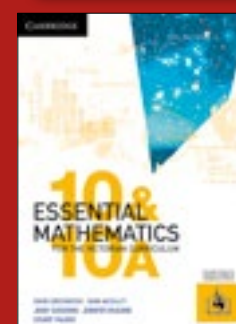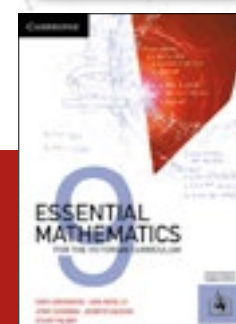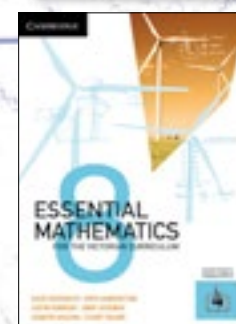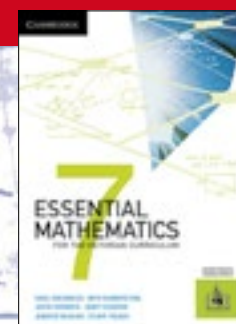
# REGISTRATION INFORMATION

**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 specufuc issues in the reading of matgematical text and particukarly word problems. In this session paul swan will share some if tgese 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 tge areas 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 colleague 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 Whimper
### 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 of 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.

*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 interdisciplinary 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 QAMT. 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.*

# KEYNOTE SPEAKERS - FRIDAY

**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.

*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.*

**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.*

# KEYNOTE SPEAKERS - FRIDAY

**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.

*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 - 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 a focus on how teachers and students can facilitate productive discussion and mathematical noticing to anticipate technology use to enable more successful task solving.

*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.*

# 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 to 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 **Ping's Café Moat**.

### Union Building

**Pings Café Moat**
*Thursday*
1. Hot Lunch Box - Lemon chicken 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 - Rainbow steak 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

**Grain Express**
1 x Large meal
PLUS Can of drink
*Available - Vegetarian, gluten free*

**Mamak Rice & Noodle**
Rice or noodle dish
PLUS Can of drink
*Available - Vegetarian*

**Supernatural La Trobe**
Any small salad
PLUS Bottle of water, raw slice
*Available - Vegetarian, vegan, gluten free, dairy free, nut free, lactose free*

**Vitality**
1 x Main roll of your choice
PLUS Drink, piece of fruit
*Available - Vegetarian*

**Writers Block**
1 x Boxed sandwich
PLUS Bottle of water, sweet treat
*Available - Vegetarian, vegan, gluten free*

# HAPPY HOUR
**DATE:** **Thursday 1 December 4:40pm - 6:40pm**
**VENUE:** **Exhibition, Main Hall, Union Building**
Happy Hour is free of charge and open to all registered delegates and exhibitors. Please indicate whether you will be attending this event when registering online.

# SHUTTLE BUS
During the conference we will be running a shuttle from Mantra Bell City to La Trobe University. This shuttle service will be run by Murrays Coaches.
Departure Point at Mantra – Corner of Hotham Street and Bell Street (in Hotham Street)
Drop Off and Pick up Point at La Trobe University – Bottom of Moat Drive at Bus Shelter

*Thursday 1 December*

| AM | **Depart**<br>Mantra Bell City | | | **Arrive**<br>La Trobe Uni Bus Shelter, Moat Drive | | |
|---|---|---|---|---|---|---|
| 7:00am | 7:45am | 8:30am | 9:15am | 9:45am | 10:30am |

| PM | **Depart**<br>La Trobe Uni Bus Shelter, Moat Drive | | | **Arrive**<br>Mantra Bell City | | |
|---|---|---|---|---|---|---|
| 5:00pm | 5:45pm | 6:30pm | 7:15pm | | |

*Friday 2 December*

| AM | **Depart**<br>Mantra Bell City | | | **Arrive**<br>La Trobe Uni Bus Shelter, Moat Drive | | |
|---|---|---|---|---|---|---|
| 7:00am | 7:45am | 8:30am | 9:15am | 9:45am | 10:30am |

| PM | **Depart**<br>La Trobe Uni Bus Shelter, Moat Drive | | | **Arrive**<br>Mantra Bell City | | |
|---|---|---|---|---|---|---|
| 5:00pm | 5:45pm | 6:30pm | 7:15pm | | |

# 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

## 9:00am-10:15am Session A (THURSDAY)

| A1 | F to 12 | Teaching Maths And YouTube - *Burkard Polster* |
| A2 | F to 12 | Word Questions - *Dr Paul Swan* |
| A3 | EY | 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* |
| A4 | F to 3 | Connecting Young Children's Mathematics Learning - *Professor Joanne Mulligan* |
| A5 | F to 6 | An Explosion Of Hope For The Teaching And Learning Of Our Future Mathematicians - *Matt Sexton* |
| A6 | F to 6 | Not So Much A Bang But A Whimper - *Rob Vingerhoets* |
| A7 | 7 to 12 | Mathematics Classrooms - Why Are Some Fireworks And Others Just Sparklers? - *Dr Derek Hurrell* |
| A8 | 7 to 12 | Models Of Inter-Disciplinary STEM Activities - How Can The Mathematics Be Made To Count? - *Russell Tytler* |

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

| B1 | EY to 2 | Number In The Early Years - *Greta Brewin, Alice Turner* |
| B2 | EY to 6 | Eliminating Maths Anxiety Through Gamification - *Brent Hughes* |
| B3 | K to 12 | Making Maths300 Work For You - *Doug Williams* |
| B4 | F to 6 | Thought-provoking Maths - *Martin Richards* |
| B5 | F to 6 | CANCELLED |
| B6 | F to 7 | Breaking Down Barriers In The Teaching And Learning Of Mathematics - *Laura Barker, Chris Greene, Rebecca Backman* |
| B7 | F to 8 | Literacy Of Mathematics - *Kathryn Palmer* |
| B8 | F to 10 | Teach Maths For Understanding - *Dr Ian Lowe* |
| B9 | F to 10 | Mathletics - Take A Fresh Look: Integrating Mathletics Into The Classroom - *Lauren Anderson, Tom Beardsworth* |
| B10 | F to 10 | reSolve: Mathematics By Inquiry - *Dr Steve Thornton, Kristen Tripet, Bruce Ferrington, Michael Klinkert* |
| B11 | F to 10 | Family Maths - *Helen Haralambous* |
| B12 | F to 12 | Lighting The Fuse: Choose Maths One Year On - *Michael O'Connor* |
| B13 | F to 12 | Getting Bang For Your Buck; Teaching Concepts Not Procedures - *Yvonne Reilly, Jodie Parsons* |
| B14 | 2 to 10 | Formative Assessment Through Technology - *Chris Daxecker, John Eskander* |
| B15 | 3 to 6 | Numeracy: Going Beyond Fluency - *Karen McDaid* |
| B16 | 3 to 7 | Teaching And Learning Multiplication Facts In A Meaningful Way - *Justine Shelley, Natalie Bierman* |
| B17 | 3 to 8 | Captain Zero . . . Hero Or Villain? - *Dr Derek Hurrell, Dr Chris Hurst* |
| B18 | 3 to 12 | The World's Most Advanced Textbook Free In 2017 - *Megan Blanch, Ash Breen* |
| B19 | 4 to 10 | An Introduction To 3D Printing - *Nat Bradshaw* |
| B20 | 5 to 8 | Differentiation Without Technology: Using Enrichment Problems For Stages 3 And 4 - *Associate Professor Anne Prescott, Pauline Kohlhoff* |
| B21 | 5 to 8 | Some Favourite Problems - Do Them, Share Them, And Teach With Them - *Giovanna Vardaro, Bruce Henry* |
| B22 | 5 to 8 | Algorithmic Thinking, Flow-charts And Coding In Transition Years - *Martin Buchholtz* |
| B23 | 5 to 8 | Whadda We Hafta Do This For? - *Peter Sanders* |
| B24 | 5 to 9 | A Teacher's Journey Through Multiplicative Thinking With Early Secondary Students - *Jim O'Neill, Lorraine Day* |
| B25 | 5 to 9 | SMART Tests, Smart Teaching, Smarter Students - *Sara McKee, Dr Max Stephens* |
| B26 | 5 to 12 | Not Quite The Illuminati - *Andrew Wrigley, Wally Brodar* |
| B27 | 5 to 12, Adult | Non-Intuitive Mathematics - *Ken Ellis, Rick Swan* |
| B28 | 6 to 8 | Number And Algebra - A Bridge From Primary To Secondary School - *Ian Bull* |
| B29 | 7 to 8 | Made By Maths At La Trobe - *Dr Katherine Seaton* |
| B30 | 7 to 9 | Algorithmic Thinking In Middle-Years Mathematics - *Greg Breese* |
| B31 | 7 to 9 | 21st Century Problem Solvers - *Rhiannon Lowrey* |
| B32 | 7 to 10 | Are You Struggling To Engage Middle School Students In The Maths Classroom? - *Adam Kruger, Scott Rumble* |
| B33 | 7 to 10 | Pythagoras - *Anthony Harradine* |
| B34 | 7 to 10 | How Far Can A Differentiated Learning Program Go? - *Jenny Sutton, Deborah Murrell* |
| B35 | 7 to 10 | How Teachers Use Education Perfect Maths To Save Themselves Time And Hassle - *Clare Feeney* |

| B36 | 7 to 10 | Coding In The Mathematics Classroom - *Shelley Cross* |
| B37 | 7 to 10 | Mathematical Modelling in STEM - *Stephen Broderick* |
| B38 | 7 to 10 | Mathematical Tasks To Expose Student Thinking - *Vanessa Rule-Paddle* |
| B39 | 7 to 12 | The Joy Of Gambling - *Marty Ross* |
| B40 | 7 to 12 | Reasoning - How To Teach It Reasonably Well - *Dr Paul Brown* |
| B41 | 7 to 12 | STEM With Graphing Calculators - *Dr Pumadevi Sivasubramaniam, Nur Syamsila Mohd Haris, Syed Azman Syed Ismail* |
| B42 | 7 to 12 | Collaborative Tasks For Learning And Assessing Mathematics - *Sabine Partington, Dr Wendy Taylor, Brent Jewell* |
| B43 | 7 to 12 | CANCELLED |
| B44 | 7 to 12 | Putting Mathematics Back Into STEM - *Rodney Anderson* |
| B45 | 7 to 12, VCAL | Mathematica - An Introduction To The Basics - *Dr David Leigh-Lancaster, Linda Tilson* |
| B46 | 8 to 11 | Wi Phi Sangaku - *Ray Cross* |
| B47 | 8 to 12, VCAL | Teaching Mathematics In The Light Of STEM - *Karim Noura* |
| B48 | 9 to 11 | Numeracy For Life: Improving Numeracy Learning Outcomes - *Cherie Pickering* |
| B49 | 9 to 12 | Exploring Functions With Desmos - *William Seager* |
| B50 | 11 to 12 | Picturing Relationships In Calculus - *Alastair Lupton* |
| B51 | 11 to 12 | Assessment: Investigative Tasks And Sample Examinations For The ACARA Senior School Mathematics Courses - *Romolo Cirillo* |
| B52 | 12 to 12 | 2015 Math Methods CAS Examinations - *Allason McNamara, Mary Papp* |

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

| B-C1 | F to 6 | Having Fun And Learning Through Games - *Peggy Ashton, Jennifer Vincent* |
| B-C2 | 3 to 10 | Algorithmic Thinking in the Maths Classroom - *Adjunct Professor Mike Clapper* |
| B-C3 | 4 to 10, VCAL | Having Some Fun With Numeracy And Maths - *Dave Tout* |
| B-C4 | 4 to 12 | Wolfram Technologies In Education And Research - Hands-on Workshop - *Craig Bauling* |
| B-C5 | 5 to 10 | Rich Learning Lab - Create And Share Resources To Make Rich Learning More Impactful And Easy - *Michaela Epstein, Joel Smith* |
| B-C6 | 5 to 12 | TI STEM Playroom - Hands-on STEM Solutions For Your Classroom - *Stephen Arnold* |
| B-C7 | 10 to 12 | Effective Use Of TI-Nspire CAS Technology For VCE Mathematical Methods SAC's - *Sanjeev Meston* |
| B-C8 | 11 to 12 | Mathematical Methods Enriched With Dynamic TI-Nspire Activities - *Frank Moya* |

## 12:20pm-1:20pm Session C (THURSDAY)

| C1 | EY to 12 | MAV - Maths Talent Quest (MTQ) - *June Penney, Frances Sidari* |
| C2 | K to 6 | What's The Story?? - *Ellen Corovic* |
| C3 | K to 6 | Developing Powerful Multiplicative Strategies - *Nadine Meredith, Tammy Roosen, Patrice Brady, Geraldine Caleta* |
| C4 | K to 12 | 21st Century Differentiated Instruction - Empowering Teachers In New Ways - *Alexander Young* |
| C5 | K to 12 | Self-selected Mathematics Learning - *Doug Williams* |
| C6 | F to 6 | Mathematical Reasoning: A Top Drawer Teacher Resource - *Libbie Spohn* |
| C7 | F to 6 | Using Challenging Mathematics Tasks And Pedagogies To Improve Achievement Of All Students - *Professor Peter Sullivan* |
| C8 | F to 6 | Lesson Study: An Inspiring And Meaningful Way To Learn From Each Other - *Susie Groves, Felicity Ames* |
| C9 | F to 8 | Literacy Of Mathematics - *Kathryn Palmer* |
| C10 | F to 10 | reSolve: Mathematics By Inquiry - *Dr Steve Thornton, Kristen Tripet, Bruce Ferrington, Michael Klinkert* |
| C11 | F to 12 | Effective Use Of ICT And Digital Technologies In The Mathematics Classroom - *Chantelle Polkinghorne, Ben Allen, Caitlin Chandler* |
| C12 | 1 to 3 | From Counting Charts To Informal Strategies - *Ian Howard* |
| C13 | 1 to 12 | The Biggest Impediment To Student Growth. And How You Can Challenge It - *Richard Wilson, Justin Matthys* |
| C14 | 2 to 6 | Developing A Place Value App: A Teacher's Journey to Create "Zero Our Hero" - *Dr Angela Rogers* |
| C15 | 2 to 6 | Building On Student Strategy Knowledge Towards Efficient Recording For The Four Operations - *Michael Bairstow, Danielle Carter* |
| C16 | 3 to 6 | Making The Impossible Possible - *Pam Hammond* |

# Session Summary

| C17 | 3 to 8 | Targeted Tasks For Taming Multiplicative Thinking - *Dr Chris Hurst, Dr Derek Hurrell* |
|---|---|---|
| C18 | 3 to 8 | 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 Tuchtan* |
| 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 Cirillo* |
| 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 Akif Altundal* |
| C34 | 7 to 12 | Teaching Mathematics In The Digital Age - *Phillip Sakellaridis* |
| C35 | 7 to 12 | Problems Worth Exploring - *Shane Dempsey, Peter Fox* |
| C36 | 7 to 12 | Putting Mathematics Back Into STEM - *Rodney Anderson* |
| C37 | 9 to 11 | Using Sliders Functionality In TI-Nspire For Graphical Exploration - *Yew Fook Chan* |
| C38 | 9 to 12 | Incorporating STEM Using TI-Innovator™ - *Neale Woods, Gary Bass* |
| C39 | 9 to 12 | Mathematical Problem Solving With A TI-Nspire CX CAS - *Dr Wee Leng Ng* |
| C40 | 10 to 12 | Worthwhile CAS Calculator Use In This Year's 2nd Methods Exam? - *Kevin McMenamin* |
| C41 | 10 to 12 | Learning Without Understanding - *Dr Pumadevi Sivasubramaniam* |
| C42 | 10 to 12 | How To Use The Notes Pages On The TI-Nspire CAS CX Calculator! - *Craig Browne* |
| C43 | 10 to 12 | How Desmos 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 Maths Methods 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 - *Allason McNamara, Dr Philip Swedosh, 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 Tripet* |
| D4 | F to 6 | Early And Aspiring Primary Maths Leaders - *Jen 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 Calthorpe* |
| D7 | F to 8 | Active e*plosion 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 6 | 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 Korbosky* |
|---|---|---|
| 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 Spithill* |
| 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 Breese* |
| 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, Jillian Kenny* |
| D30 | 7 to 10 | Differentiated Learning With Pearson Maths 2nd Edition - *Julian Lumb, 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 Pavlinovich* |
| 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 Brugård* |
| 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* |

# Session Summary

## 3:40pm-4:40pm Session E (THURSDAY)

| | | |
|---|---|---|
| E1 | EY to 2 | Challenging Tasks For The Early Years (Foundation - Year 2) - *Nadia Walker, Lisa Cuming* |
| E2 | K to 6 | TUNE ME IN, Short Sharp Maths Warm-Ups To Get Your Lessons Rolling - *Tim Colman, Jono Schmidt* |
| E3 | K to 12 | Self-selected Mathematics Learning - *Doug Williams* |
| E4 | F to 2 | Maths Card Games In Early Childhood F-2 - *Richard Korbosky* |
| E5 | F to 6 | Digital Tools To Capture The Proficiency Strands - *Brent Hughes* |
| E6 | F to 6 | Immersed In Maths - *Stephen Cadusch* |
| E7 | F to 6 | CANCELLED |
| E8 | F to 8 | Algebra Has An Identity Problem - *Jan Cavanagh* |
| E9 | F to 9 | Teachers' Emotional Mechanisms To Support Learning In Classroom - *Xin Zhao, Dr Max Stephens* |
| E10 | F to 10 | Essential Assessment - Victorian Curriculum Assessment And Curriculum Made Easy - *Andrew Spitty* |
| E11 | F to 12 | Prompting Productive Mathematical Discussions - *Dr Amie Albrecht* |
| E12 | F to 12 | Effective Use Of ICT And Digital Technologies In The Mathematics Classroom - *Chantelle Polkinghorne, Ben Allen, Caitlin Chandler* |
| E13 | F to 12 | The Importance Of A Growth Mindset In Mathematics (What The Dweck??) - *Leanne McMahon* |
| E14 | 1 to 10 | Go Further With PAT Maths - *Pauline Rogers* |
| E15 | 1 to 10 | Inquiry-based Mathematics - *Shyam Drury, Scott Hamilton* |
| E16 | 2 to 8 | Using Sequenced Lessons To Develop Students' Multiplicative Thinking - *Lei Bao* |
| E17 | 3 to 6 | Numeracy: Going Beyond Fluency - *Karen McDaid* |
| E18 | 3 to 6 | Grade 3/4s Developing Big Mathematical Ideas: Sharon's Little Red Book - *Sharon Goldfinch, Dr Gaye Williams* |
| E19 | 3 to 10 | There's A Lot More To Times Tables Than Meets The Eye - *Christine Lenghaus* |
| E20 | 3 to 10 | Algorithms And Coding Content In The New Victorian Curriculum - *Megan Blanch, Ash Breen* |
| E21 | 3 to 10, VCAL | Engaging Games To Develop Skills, Confidence And Higher Order Thinking - *Andrew Lorimer-Derham* |
| E22 | 4 to 9 | Understanding Where Learners Are In Their Learning Requires More Than Skills-based Assessment - *Professor Dianne Siemon* |
| E23 | 4 to 10 | Using Big Ideas To Connect The Dots In Mathematics - *Dave Tout, Jim Spithill* |
| E24 | 4 to 12 | Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview - *Craig Bauling* |
| E25 | 5 to 7 | Using Concrete And Visual Representations For Conceptual Understanding Of Operations Involving Fractions - *Dr Heather McMaster* |
| E26 | 5 to 10 | Scaffolding Statistics Understanding In The Middle School - *Professor Jane Watson* |
| E27 | 5 to 11 | Numeracy Intervention That Works - *Michelle Anderson, Helen Barker* |
| E28 | 5 to 12 | Cloud-based Planning, Tracking & Reporting For Easy Differentiation In Today's Classrooms - *William Murray, Victoria Pichler* |
| E29 | 6 to 7 | Using Technology To Teach And Assess Probability In The Middle Years Programme - *Kim Shuyue Zhang, Su Yin Tee* |
| E30 | 6 to 10 | Differentiation Versus Modification - How Do I Effectively Differentiate For All Learning Needs And Styles? - *Elizabeth Lonergan* |
| E31 | 6 to 10 | Problem Solving Literacy, Pedagogy And Strategies - *Kelly Gallivan, Jessica Mount, Shanna Rankin* |
| E32 | 7 to 8 | A Hands-on Approach To Mathematics - *Kim Walker* |
| E33 | 7 to 10 | Maths - Not For People Like Me - *Jillian Kenny, Felicity Furey* |
| E34 | 7 to 10 | Maths In A Box - Developing Mathematical Modelling Skills - *Jim Lowe* |
| E35 | 7 to 10 | What Happens When Challenging Tasks Are Used In Mixed Ability Middle School Mathematics Classrooms? - *Karen Perkins* |
| E36 | 7 to 10 | Using Challenging Mathematics Tasks And Pedagogies To Improve Achievement Of All Students - *Professor Peter Sullivan* |
| E37 | 7 to 10 | Mathematical Modelling Using Handheld Technology - *Thomas Yeo* |
| E38 | 7 to 11 | Re-Visioning Year 10: Student Ownership, Differentiation, And Rigour - *Colin Shnier, Emily Breslin* |
| E39 | 7 to 12 | Think Like A Coder - *Antje Leigh-Lancaster, Aynur Bulut, Sophie Matta* |
| E40 | 7 to 12 | Proofs By Pictures - *Adjunct Professor Mike Clapper* |
| E41 | 7 to 12 | CODE For Success In Mathematics - *Peter Fox* |
| E42 | 7 to 12 | STEM With Graphing Calculators - *Dr Pumadevi Sivasubramaniam, Nur Syamsila Mohd Haris, Syed Azman Syed Ismail* |
| E43 | 9 to 11 | Mathematical Investigations Using TI-Nspire: Years 9 And 10 - *Frank Moya* |
| E44 | 9 to 12 | Mathematical Problem Solving With A TI-Nspire CX CAS - *Dr Wee Leng Ng* |
| E45 | 10 to 12 | VCE Algorithmics (Modelling And Solving Problems) - *Georgia Gouros* |
| E46 | 10 to 12 | Approximations, Recursion And Sampling Using The Technology Of The Casio ClassPad - *Kevin McMenamin* |
| E47 | 10 to 12 | Understanding Finance - The General And Further Mathematics Courses - *Robert Vermay* |
| E48 | 10 to 12 | A New Look At Trinomials - *Dr Ray Williams* |
| E49 | 11 to 12 | Volumes Of Revolution Using TI-Nspire - *Tim Grabovszky, Raymond Rozen* |
| E50 | 12 to 12 | Using CAS To Teach Sampling In Methods And Specialist - *Greg Neal, Agathi Neal* |

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

| | | |
|---|---|---|
| F1 | F to 12 | Same Sermon, New Jokes - *Marty Ross* |
| F2 | F to 12 | Learning Year Level Mathematics Curriculum When You're Years Behind: Approaches For The Classroom Teacher Of Students With Mathematics Learning Difficulties - *Dr Rhonda Faragher* |
| F3 | EY | Drawing, Gesturing And Talking: Using What Comes Natural To Young Learners Of Mathematics - *Professor Janette Bobis* |
| F4 | F to 6 | Planning For And Capitalising On 'Teachable Moments' In The Primary Mathematics Classroom - *Dr Tracey Muir* |
| F5 | F to 6 | Stories From The Classroom: The Practices Of Effective Teachers - *Professor Doug Clarke* |
| F6 | 7 to 12 | Digital Technologies Transforming Teaching And Learning - *Dr Jill Brown* |
| F7 | 7 to 12 | STEM - Mathematical Pedagogy That Supports Your STEM Program - *Yvonne Reilly, Jodie Parsons, Thao Huynh* |
| F8 | 7 to 12 | Inclining To Explore Mathematically And Pedagogically: Students And Teachers Possessing The Same Characteristics - *Dr Gaye Williams* |

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

| | | |
|---|---|---|
| G1 | K to 6 | What's The Story?? - *Ellen Corovic* |
| G2 | K to 6 | Developing Powerful Multiplicative Strategies - *Nadine Meredith, Tammy Roosen, Patrice Brady, Geraldine Caleta* |
| G3 | K to 12 | 21st Century Differentiated Instruction - Empowering Teachers In New Ways - *Alexander Young* |
| G4 | F to 2 | Maths Card Games In Early Childhood F-2 - *Richard Korbosky* |
| G5 | F to 4 | Daily Tasks To Develop Mental Computation - *Colleen Monaghan* |
| G6 | F to 4 | Using The Early Years Numeracy Interview To Inform Teaching Practice - *Nicole Rheumer, Mandy Henia* |
| G7 | F to 6 | Growing Your Mindset - *Cassandra Lowry, Alanna Butcher* |
| G8 | F to 6 | Assessing Common Misunderstandings To Support Primary Students At Risk In Mathematics - *Jen Briggs* |
| G9 | F to 6 | Data Fun With Bioglyphs - *Dr Leicha Bragg, Jessica Koch, Ashley Wilis* |
| G10 | F to 6 | Mathematical Reasoning: A Top Drawer Teacher Resource - *Libbie Spohn* |
| G11 | F to 10 | Essential Assessment – Victorian Curriculum Assessment And Curriculum Made Easy - *Andrew Spitty* |
| G12 | F to 10 | Mathletics - Take A Fresh Look: Integrating Mathletics Into The Classroom - *Lauren Anderson, Tom Beardsworth* |
| G13 | F to 12 | Building (And Rejecting!) Mathematical Intuition - *Dr Amie Albrecht* |
| G14 | F to 12 | Planning Teacher Professional Learning To Foster Innovation In Mathematics Teaching - *Professor Peter Sullivan, Catherine Smith, Paul Stenning* |
| G15 | 2 to 5 | Step By Step - Maths Problem Solving Strategies Using Rich Investigative Tasks - *Cathy Davidson, Jenny Dockeary, June Penney* |
| G16 | 2 to 7 | Challenging Tasks: Multiplicative Thinking - *Dr Sharyn Livy, Dr Ann Downton* |
| G17 | 2 to 8 | Using Sequenced Lessons To Develop Students' Multiplicative Thinking - *Lei Bao* |
| G18 | 2 to 10 | Formative Assessment Through Technology - *Chris Daxecker, John Eskander* |
| G19 | 2 to 10 | Kids & Cup Cakes & Poster Problem Clinics - *Doug Williams* |
| G20 | 3 to 8 | The Lost Logic Of Elementary Mathematics And The Haberdasher Who Kidnapped Kaizen - *Jonathan Crabtree* |
| G21 | 3 to 11 | Creating Engaging Activities Using Origami - *Ming Gao, Jan Mann* |
| G22 | 3 to 12 | Mathspace: Personalised Learning For The New Victorian Curriculum - *Megan Blanch, Ash Breen* |
| G23 | 4 to 12 | Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview - *Craig Bauling* |

# Session Summary

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

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

## 2:20pm-3:20pm Session I (FRIDAY)

# Session Summary

| I19 | 5 to 9 | An Intensive Intervention Program For Underachieving And Disengaged Year 8 Students Focussing On Multiplicative Thinking, Motivation And Engagement - *Oliver Lovell, Dr Max Stephens* |
|-----|--------|------|
| I20 | 5 to 10 | Using Maths Games On The iPad To Increase Student Engagement - *Alistair Shaw* |
| I21 | 6 to 8 | Investigative Activities: Year 7 Australian Mathematics Curriculum - *Romolo Cirillo* |
| I22 | 6 to 10 | Problem Solving Literacy, Pedagogy And Strategies - *Kelly Gallivan, Jessica Mount, Shanna Rankin* |
| I23 | 7 to 9 | The Miniature Maths Book - A Student's First Resort - *Brett Van As* |
| I24 | 7 to 10 | Investing In Teachers: A System Plan - *Catherine Smith, Paul Stenning* |
| I25 | 7 to 10 | Making Confident Maths Teachers - *Dr Ian Lowe* |
| I26 | 7 to 10 | An Introduction To Programming And Algorithmic Thinking With Python - *Nat Bradshaw* |
| I27 | 7 to 10 | How Teachers Use Education Perfect Maths To Save Themselves Time And Hassle - *Clare Feeney* |
| I28 | 7 to 10 | Our Experiences Implementing Personalised Learning - *Vicki Nation, David Kinnersley* |
| I29 | 7 to 10 | Desmos For Pre-VCE Mathematics - *Bryn Humberstone, Chris McCarty* |
| I30 | 7 to 11 | Re-Visioning Year 10: Student Ownership, Differentiation, And Rigour - *Colin Shnier, Emily Breslin* |
| I31 | 7 to 12 | Mathematica and Wolfram\|Alpha, Coding And Functionality To Access Real-world Data - *Ian Willson* |
| I32 | 7 to 12 | Nspired To Flip - *Melissa Hourigan* |
| I33 | 7 to 12 | Introduction To Programming Using TI-Nspire - *Raymond Rozen, Tim Grabovszky* |
| I34 | 7 to 12 | Digital Resources For Mathematics Education - *Ro Bairstow* |
| I35 | 7 to 12 | Collaborative Tasks For Learning And Assessing Mathematics - *Sabine Partington, Dr Wendy Taylor, Brent Jewell* |
| I36 | 8 to 9 | How To Run A Bridge Building Competition - *Peter McClive* |
| I37 | 8 to 12, VCAL | Teaching Mathematics In The Light Of STEM - *Karim Noura* |
| I38 | 9 to 10 | Probability And Sports Gambling - *Robert Money* |
| I39 | 9 to 11 | Numeracy For Life: Improving Numeracy Learning Outcomes - *Cherie Pickering* |
| I40 | 9 to 11 | Creating Lua Apps For TI-Nspire Without Coding - *Neale Woods* |
| I41 | 9 to 12 | A Forgotten Theory In Secondary School Mathematics - Polar Coordinates - *Hoi Yuen Hilary Lai* |
| I42 | 10 to 12 | Mandelbrots And Multibrots - *Brett Stephenson* |
| I43 | 10 to 12 | Great e$^x$pectations – E($x$) and e$^x$ - *Brian Lannen* |
| I44 | 10 to 12 | Symbol Sense: From School To University - *Caroline Bardini, Robyn Pierce* |
| I45 | 10 to 12 | EAL In The Maths Classroom - *Ewan Campbell, Richard Myddleton* |
| I46 | 10 to 12 | VCE Algorithmics (Modelling And Solving Problems) - *Georgia Gouros* |
| I47 | 10 to 12 | The Senior Mathematics Class Can Be Fun Too - *Lorna McClory* |
| I48 | 11 to 12 | Bisection Method & Newton's Method - *Brian Stokes* |
| I49 | 11 to 12 | Harmony In Polynomials - *Dr Ray Williams, Peter Flynn* |

## 2:20pm-4:40pm Session I-J (Friday)

| I-J1 | 4 to 12 | Making Worksheets Come Alive With Adobe Acrobat Pro? - *Brian Chau* |
|------|---------|------|
| I-J2 | 7 to 11 | Using 'Algebra Tiles' To Teach Integers, Simplification, Expansion And Factorisation - *Michael O'Reilly, Norrian Rundle* |
| I-J3 | 7 to 12 | Algebra Experiences You Won't Forget - *Doug Williams* |
| I-J4 | 7 to 12 | Implementing Computer-Based Exams For VCE Mathematical Methods - *Rohan Barry, Terri Gregotski, Ian Berryman* |
| I-J5 | 9 to 12 | Mathematica For Mathematics Teachers - How To Create Tests, Worksheets And More - *John Fitzherbert* |

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

| J1 | EY to 2 | Challenging Tasks For The Early Years (Foundation - Year 2) - *Nadia Walker, Lisa Cuming* |
|----|---------|------|
| J2 | EY to 12 | MAV - Maths Talent Quest (MTQ) - *June Penney, Frances Sidari* |
| J3 | K to 1 | Moving Maths - *Elise Mackie, Ben Kelso* |
| J4 | K to 6 | TUNE ME IN, Short Sharp Maths Warm-Ups To Get Your Lessons Rolling - *Tim Colman, Jono Schmidt* |
| J5 | F to 6 | Once A Day-Two Ways - *Shane Calthorpe* |
| J6 | F to 6 | Immersed In Maths - *Stephen Cadusch* |
| J7 | F to 8 | Maths And Minecraft - *David Shigrov* |
| J8 | F to 8 | Waging War On Worksheets - *Martin Holt* |

# Session Summary

| J9 | F to 10 | Financial Numeracy In The New Victorian F-10 Curriculum - *Shane O'Connor* |
|----|---------|------|
| J10 | 1 to 6 | Creative Design With MATHOMAT And Snappies - *John Lawton, Emma Waite, Callum Waite* |
| J11 | 1 to 12 | The Biggest Impediment To Student Growth. And How You Can Challenge It - *Richard Wilson, Justin Matthys* |
| J12 | 3 to 6 | Grade 3/4s Developing Big Mathematical Ideas: Sharon's Little Red Book - *Sharon Goldfinch, Dr Gaye Williams* |
| J13 | 3 to 8 | Obedience And Inequality OR Mathematics? Which Are You Teaching? - *Dr Jude Ocean* |
| J14 | 3 to 10 | There's A Lot More To Times Tables Than Meets The Eye - *Christine Lenghaus* |
| J15 | 3 to 10, VCAL | Engaging Games To Develop Skills, Confidence And Higher Order Thinking - *Andrew Lorimer-Derham* |
| J16 | 3 to 12 | The Joy Of Informatics, From CAT To AIO And Beyond - *Jan Honnens* |
| J17 | 4 to 8 | Google "Maths" - Using Google Apps For Maths Learning And Teaching - *Mark Gleeson* |
| J18 | 5 to 7 | Using Concrete And Visual Representations For Conceptual Understanding Of Operations Involving Fractions - *Dr Heather McMaster* |
| J19 | 5 to 8 | Some Favourite Problems - Do Them, Share Them, And Teach With Them - *Giovanna Vardaro, Bruce Henry* |
| J20 | 5 to 8 | Exploring Problem Solving Strategies In Maths - Teachers' Starting Point - *Iqbal Hossain, Fahmida Hossain* |
| J21 | 5 to 10 | Teaching Statistics With Data Investigations And 'Cool' Tools - *Dr Dung Tran, Dr Max Stephens* |
| J22 | 5 to 12 | Cloud-based Planning, Tracking & Reporting For Easy Differentiation In Today's Classrooms - *William Murray, Victoria Pichler* |
| J23 | 7 to 9 | The Miniature Maths Book - A Student's First Resort - *Brett Van As* |
| J24 | 7 to 10 | Pokies And Responsible Gambling - *Dr Ian Lowe* |
| J25 | 7 to 10 | Maths In A Box - Developing Mathematical Modelling Skills - *Jim Lowe* |
| J26 | 7 to 10 | An Introduction To Programming And Algorithmic Thinking With Python - *Nat Bradshaw* |
| J27 | 7 to 10 | How To Teach Algebra To Secondary School Students - *Peter Collins* |
| J28 | 7 to 10 | Card Games - *Helen Haralambous* |
| J29 | 7 to 10 | CANCELLED |
| J30 | 7 to 12 | Proofs By Pictures - *Adjunct Professor Mike Clapper* |
| J31 | 7 to 12 | Introduction To Programming Using TI-Nspire - *Raymond Rozen, Tim Grabovszky* |
| J32 | 7 to 12 | Digital Resources For Mathematics Education - *Ro Bairstow* |
| J33 | 7 to 12 | STEM Activities In Astronomy - *Stephen Broderick* |
| J34 | 7 to 12, VCAL | Making Flipped Learning Work For Your Class - *Ben Dennis* |
| J35 | 7 to 12, VCAL | Teaching Mathematics In The Light Of STEM - *Karim Noura* |
| J36 | 8 to 12 | Using Algorithms To Make Better Decisions - *Kylie McColl, Michael Kirley* |
| J37 | 9 to 12 | A Forgotten Theory In Secondary School Mathematics - Polar Coordinates - *Hoi Yuen Hilary Lai* |
| J38 | 10 to 12 | Symbol Sense: From School To University - *Caroline Bardini, Robyn Pierce* |
| J39 | 10 to 12 | EAL In The Maths Classroom - *Ewan Campbell, Richard Myddleton* |
| J40 | 10 to 12 | How Mathematical Modelling Can Help You Understand The World - *Jan Brugård* |
| J41 | 10 to 12 | Worthwhile CAS Calculator Use In This Year's 2nd Methods Exam? - *Kevin McMenamin* |
| J42 | 10 to 12 | How To Use The Notes Pages On The TI-Nspire CAS CX Calculator! - *Craig Browne* |
| J43 | 11 to 12 | Bisection Method & Newton's Method - *Brian Stokes* |
| J44 | 11 to 12 | Assessment: Investigative Tasks And Sample Examinations For The ACARA Senior School Mathematics Courses - *Romolo Cirillo* |
| J45 | 11 to 12, VCAL | VCAL Responsible Gambling Victoria Units - *Jamie Gray, Oliver Lovell* |

# 9:00am-10:15am Session A (THURSDAY)
# Keynote Presentations

**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 NEWMAN 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/numeracy/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/num_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 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.

**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 of 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 I1*

**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 Maths**
*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 maths use a blend of digital resources and 'hands-on' activities. We'll also look at ways to integrate mathematics and digital technologies. See how directional language is used with programmable robots, explore contexts to collect, interrogate and display data digitally. The maths quiz maker is a useful way to combine mathematical operations and learn about flow charts and decision making. We will be looking at teaching ideas available for free on The Digital Technologies Hub https://www.digitaltechnologieshub.edu.au/. Thought-provoking maths are free resources available through Scootle https://www.scootle.edu.au/ec/p/home.
***Keywords: Games/Number/Online Learning/Technology***
***Not repeated***

**B5      Multiplicative Thinking: Groups Of, Arrays, Regions, 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 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 G12***

**B10    reSolve: Mathematics By Inquiry**
*Dr Steve Thornton - Australian Academy of Science, ACT*
*Kristen Tripet - 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 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 rest in pre and post testing, but integrates itself through 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 proficiencies 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 I11*

**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/iPad.*
*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 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 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 used effectively 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*
**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 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 G32*

**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*

**B32    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 H27*

**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 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 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, hypothesize, 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. Not only is this study educational and mathematically rich, it can, perhaps surprisingly, be lucrative. There is the added benefit that we can really irritate Nick Xenophon and other sanctimonious clowns.
*Keywords: Probability & Statistics, Sitrring 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 Syamsila Mohd Haris - 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*
*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 ran 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 Revesby, 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 as it occurs. A variety of topics from the Australian curriculum will be explored.
*Keywords: Assessment/Technology*
*Not Repeated*

~~CANCELLED~~

**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 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 C36*

**B45    Mathematica - 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 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 Years 8-11. Investigations may be done by hand. Technology based illustrations will use TI-Nspire calculators which will be provided. You're welcome to bring you own or a laptop.
*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 of 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**
*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 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*

**B-C7  Effective Use Of TI-Nspire CAS Technology For VCE Mathematical Methods SAC's**
*Sanjeev Meston - Lakeside College, VIC*

**Workshop**                                                                                        **Years 10 to 12**
The session will focus on Analysis and Application on Concepts learned in this course as preparation for the VCE
SAC's at Units 3 and 4 level. The session will also incorporate the new concepts that have been included in the
study design.
*Notes: It is advisable to bring personal handhelds so that participants can have the files for future use.*
*Keywords: Technology*
*Not Repeated*

**B-C8  Mathematical Methods Enriched With Dynamic TI-Nspire Activities**
*Frank Moya - Educational Consultant, VIC*

**Workshop**                                                                                        **Years 11 to 12**
This will be a hands-on workshop in which participants create dynamic, interactive TI-Nspire documents related to
various VCE Maths Methods topics. These topics will include bisection and Newton's methods, calculus and the
distribution of sample proportions and confidence intervals. In addition to setting up statistical inference simulations
for sample proportions, other TI-Nspire functionalities to be used will include dynamic computation in the Notes
application, dynamic geometry, data capture, dynamic graphing using sliders and the use of the transformations
menu.
*Notes: Loan calculators will be available, if required. Alternatively, bring your own handheld or TI-Nspire software,
with the latest operating system.*
*Keywords: 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 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 leaning 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**
*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 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 Walls 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 Tripet - 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 I7*

**C13 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 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 straight forward 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 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 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 Tuchtan - 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*
*Norrian 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**                                                                          **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 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 Akif Altundal - Amity 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 exams. 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 Sakellaridis - 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 handhelds 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 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*
*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 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 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 Humberstone - 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 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*
*Repeated as H46*

**C45     ClassPad: CAS For Learning In Maths Methods Units 1&2**
*Ian Sheppard - Geelong College, VIC*
**Workshop**                                                          **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**
*Nazim 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 G50*

**C47** **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 D50*

**C48** **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 J45*

**C49** **2015 Specialist Mathematics Examinations**
*Allason McNamara - Mount Scopus Memorial College, VIC*
*Dr Philip Swedosh - King David School, VIC*
*Dean Lamson - Kardinia International College, VIC*

**Lecture** **Years 12 to 12**
Allason, 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 - Killester College, VIC*

**Workshop** **Years EY to 12 & VCAL**
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 Jelbart - Victoria University, VIC*

**Lecture** **Years K to 12**
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** **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 H3*

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

**Lecture** **Years F to 6**
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 Derrimut 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** **Years F to 6**
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 YuMi 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 session 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 Korbosky - Dualoh 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**
*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 I15*

**D17     Maths And Sport**
*Dr Ian Lowe - The Mathematical Association of Victoria*

**Workshop**                                                  **Years 4 to VCAL**
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 <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*
*Not Repeated*

**D18     Exploring Problem Solving Strategies In Maths - Teachers' Starting Point**
*Iqbal 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 J20*

**D19     Formative Assessment For The Transition From Year 6 To Year 7**
*Pauline Rogers - ACER, VIC*
*Jim Spithill - 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 G24*

**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 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 metrication 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 I18*

**D21     Algebraic Thinking Revealed In Responses To Fraction Tasks**
*Catherine Pearn - 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 C25*

**D22     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 H22*

**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 readings to use in classrooms.
*Notes: Please bring an iPad or laptop with you!*
*Keywords: Probability & Statistics/Technology*
*Repeated as J21*

**D24     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 G29*

**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 G30*

**D26   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*

**D27   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*

**D28   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*

**D29   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*

**D30   Differentiated 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*

**D31   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*

**D32   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**
re(Solve) 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*

**D33   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*

**D34   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*

**D35   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*

### 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 to 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 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 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
*Kylie McColl - The University of Melbourne, VIC*
*Michael Kirley - 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 207 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. This means that there is a potential that by the time learners reach Grade 11, they would have acquired different kinds 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 is less 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*

**CANCELLED**

### 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 datasets 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 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*
*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 Curriculum ATAR 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 class 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 project "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*

**D-E4    Hexagonal Prism, 2^x, Numeration And Calculus**
*Anthony Harradine - Potts-Baker Institute, Prince Alfred College, SA*

**Workshop**                                                    **Years 10 to 12**
Come and experience a series of increasingly complex activities about functions and the hexagonal prism. The tasks require students to apply Pythagoras, trigonometry and either the table function (or spreadsheet) on a calculator and/or calculus. Low entry, as high an exit as you desire with a delicious outcome that links nature to mathematics.
*Notes: Please bring, paper, pencil, calculator, or device of your choice.*
*Keywords: Geometry/Measurement*
*Not Repeated*

# 3:40pm-4:40pm Session E (THURSDAY)

**E1    Challenging Tasks For The Early Years (Foundation - Year 2)**
*Nadia 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 J1*

**E2    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 J4*

**E3    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 C5*

**E4    Maths Card Games In Early Childhood F-2**
*Richard Korbosky - Dualoh 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.
*Keywords: Games*
*Repeated as G4*

**E5    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 stop all of this.
*Notes: Bring something that connects to the internet.*
*Keywords: Technology*
*Not Repeated*

**E6    Immersed 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 this model. This presentation will provide details of how we have structured classes; our timetable; feedback and comments from students, parents, and teachers; impact on student learning and engagement; positives and negatives; and overall impressions and experiences from the past two years.
*Keywords: Innovative Models/Leadership*
*Repeated as J6*

**E7    Multiplicative Thinking: Groups Of Arrays, Regions, 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 B5*

~~Cancelled~~

**E8    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 Repeated*

**E9    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 students understand 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 mathematics 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 S. 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 which 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**
*Shyam 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. Shyam 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 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 - 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 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 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 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 learning management system, is getting re-routed to easier problem or a 'hint' the way to go? This seminar 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 I17*

**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 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 G23*

**E25    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 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 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 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 Pichler - 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 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 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 Tee - 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?**
*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 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?**
*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 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***
***Repeated as I30***

**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***
***Repeated 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 Pumadevi Sivasubramaniam - Teacher Education Institute, Malaysia*
*Nur Syamsila Mohd Haris - 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***
***Repeated as B41***

**E43    Mathematical Investigations Using TI-Nspire: Years 9 And 10**
*Frank Moya - 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***
***Repeated 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***
***Repeated 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. Annuities, 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 Vermay - 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 D51*


**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 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**
*Marty 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.

**F6** **Digital Technologies Transforming Teaching And Learning**
*Dr Jill Brown - Australian Catholic University, VIC*

**Keynote** **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 findings from classroom research in Years 9-11 with a focus on how both teachers and students can facilitate productive discussion and mathematical noticing to anticipate technology use that enables more successful task solving.

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

**Keynote** **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 to 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.

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

**Keynote** **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.

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

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

**Workshop** **Years K to 6**

Participants in this professional leaning 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 C2*

**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.
*Keywords: Multiplicative Thinking, Number*
*Repeated as C3*

**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.
*Keywords: Assessment*
*Repeated as C4*

**G4** **Maths Card Games In Early Childhood F-2**
*Richard Korbosky - Dualoh 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.
*Keywords: Games*
*Repeated as E4*

**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.
*Keywords: Number*
*Not Repeated*

**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*
*Not Repeated*

## 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 wifi 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 Wilis - 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 students 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 zigzag 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 Dockeary - 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 mathematical 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 distractors? 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 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 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 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 B14*

### 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**

*Commercial Presentation*

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*

### 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 Spithill - 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 B25*

## 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**

*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 D25*

## 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 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 B29*

## G33  Using Technology To Teach Geometry In A Local (Shanghai) International School
*Kim Shuyue Zhang - World Foreign Language Academy, Shanghai*
*Su Yin Tee - 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. Using graphing technology, we showed and tried to inspire students to find special cases of positions of different geometric objects.

*Keywords: Geometry/Technology*
*Not Repeated*

**G34    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 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 Yeo - 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 to 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 - Bairnsdale 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, isosceles 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 Sakellaridis - 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 handhelds will be available if required.
*Notes: Bring your TI-Nspire CAS handheld.*
*Keywords: Technology*
*Not Repeated*

**G46    Nspired Mathematics Classroom**
*Bozenna 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 Vermay - 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 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 D48*

**G50    Linear Regression Analysis Using MS Excel: Simulation, Model Fitting, Diagnostics And Interpretation**
*Nazim 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*

**G-H3    Wolfram STEM Tools Available For Free To All Victoria Schools: An Overview**
*Jan Brugärd - Wolfram MathCore, Sweden*

**Computer Workshop**                                                      **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 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*

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

**H1    Using Technology To Make Formative Assessment More Effective And Efficient**
*Karen McMullen - Killester College, VIC*

**Workshop**                                                      **Years EY to 12 & VCAL**
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 D1*

**H2    Working Mathematically With Infants**
*Doug Williams - Mathematics Centre*

**Workshop**                                                      **Years K to 2**
Children learn more and teachers love it. Developed by teachers who are engineering their classrooms to enhance children's number sense, Working Mathematically with Infants splices Threaded Activities from Calculating Changes with Investigations adapted from Mathematics Task Centre and elsewhere. Access to Maths300 is not necessary, but enriches if available. Threading is a teaching technique using rich, differentiated activities for small amounts of time often. The workshop introduces sample activities and investigations and the planning model teachers have developed to implement them. Mathematical conversation and learning in community - whole class and small groups - are key features.
*Keywords: Maths by Inquiry*
*Not Repeated*

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

**H4    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 G7*

**H5    Data Fun With Bioglyphs**
*Dr Leicha Bragg - Deakin University, VIC*
*Jessica Koch - Toorak College, VIC*
*Ashley Wilis - 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 G9*

**H6    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 B6*

**H7    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 E9*

**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**
*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 E14*

**H13    Engaging Tools Activities And Games That Deepen Learning**
*Michael Bairstow - 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 - Dualoh 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 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*
*Stephanie 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 - 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 Numbla. 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 Numbla 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*

**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 E27*


**H25    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 B26*


**H26    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 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*
*Repeated as J27*

### H30 Pearson Maths 2nd Edition - Coding, STEM And New Victorian Curriculum
*Tim Carruthers - 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, interactives, 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 - Bairnsdale 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 Mathematica - 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 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 B45*

**H37     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/VCAL*
*Repeated as D41*

**H38     Gamification And ICT In Year 9 Probability**
*Simon Lewis - Stawell Secondary College, VIC*
*Jonathan Pollock - Stawell Secondary College, VIC*

**Computer Workshop**                                                                              **Years 9 to 9**
Experience a casino management group project aimed at increasing engagement and building Excel skills at Year 9. Students investigate the probabilities of casino style slot machines and use that knowledge to manage and build their own casinos. They then use Excel and statistics to create a report to their board of directors regarding their casino's performance. Engagement is increased through working in teams and through computer simulated casino performance. Spark endless conversations about the probabilities involved, core business principles, responsible gambling, and computer programming. All resources, including student workbooks, unit outlines, Excel templates, Simulator and instructional videos are included.
*Keywords: Probability & Statistics/Technology*
*Not Repeated*

**H39     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 I38*

**H40     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 B49*

**H41     Random Walks And Complex Numbers**
*Brett Stephenson - Guilford Young College, TAS*

**Workshop**                                                                                      **Years 10 to 12**
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 this walk and walks in other dimensions and how we can use complex numbers to look at the outcomes. Some of the ideas will be investigated using Graphics Calculator technology and Casio ClassPad II calculators will be available. The use of Scratch to investigate random walks will also be demonstrated.
*Keywords: Probability & Statistics/Technology*
*Not Repeated*

**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*
*Repeated as D46*

**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*
*Repeated as D47*

**H44     The Senior Mathematics Class Can Be Fun Too**
*Lorna McClory - Staughton 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*
*Repeated as I47*

**H45     Mathematics Subjects At The Distance Education Centre Victoria**
*Neale Woods - Distance Education Centre Victoria*
*Georgia Gouros - 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*
*Repeated as C44*

**H47** **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 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 E50*

# 2:20pm-3:20pm Session I (FRIDAY)

**I1** **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 B1*

**I2** **Moving Maths**
*Elise Mackie - Derrimut Primary School, VIC*
*Ben Kelso - Derrimut 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 math 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 J3*

**I3** **reSolve: Maths By Inquiry - The Project In Victoria**
*Nadia Walker - reSolve: Mathematics by Inquiry Project, VIC*
Workshop                                **Years F to 6**
reSolve: Maths by Inquiry is a national project that provides Australian schools with classroom resources to help students learn mathematics in an innovative and engaging way. The resources are based on relevant 'real world' examples to help students deal with complex situations using a variety of mathematical methods. This hands-on workshop will unpack some of the Primary classroom resources and give participants an opportunity to trial the lessons and provide feedback for the project. reSolve: Maths by Inquiry is an initiative of, and funded by, the Australian Government Department of Education and Training.
*Keywords: Maths by Inquiry*
*Not Repeated*

**I4** **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 J8*

**I5** **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 J7*

**I6** **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 B12*

**I7** **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 C12*

**I8** **Re-examining Student Experiences With Manipulatives Using The MATHOMAT Template**
*John Lawton - Objective Learning Materials, VIC*
*Richard Korborsky - Edith Cowan University, WA*
Workshop                                **Years 1 to 6**
*Commercial Presentation*
Constructing designs and being mathematically creative using pattern blocks, attribute blocks, and 2-D shapes is a very common, and important, learning strategy in primary school classrooms. Students learn by reflecting on their actions with manipulatives and their drawings. In this workshop Richard Korbosky shows how learners can use MATHOMAT to make geometric drawings and to then check their work. This powerful learning strategy calls on students to reflect and to refine, their ideas as they work. Participants will be introduced to the new MATHOMAT ONE primary school template. This session gives participants a glimpse of the enormous potential that Mathomat has as a classroom tool.
*Keywords: Geometry*
*Not Repeated*

**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 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 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 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 B16***

**I12 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 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 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 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***

**I18     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 metrication 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*

**I19     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*

**I20     Using Maths Games On The iPad To Increase Student Engagement**
*Alistair 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 Numbla. 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 Numbla from the iTunes store.*
*Keywords: Games/Technology*
*Repeated as H23*

**I21     Investigative Activities: Year 7 Australian Mathematics Curriculum**
*Romolo 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*

**I22     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*

**I23     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 always 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 J23*

**I24     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*

**I25     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*

**I26     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 Humberstone - 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 to 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 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***
***Repeated as E38***

**I31 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 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*

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 ran 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 Scienceworks 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 on 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 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 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 trial 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    Mandelbrots And Multibrots**
*Brett Stephenson - Guilford 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 e$^x$pectations – E($x$) and e$^x$**
*Brian Lannen - Wodonga Institute of TAFE, VIC*

**Lecture**                                                                             **Years 10 to 12**
Maths e$^x$plosions 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$^x$ 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$^x$ as they apply to the Maths Methods course, but to also demonstrate some favourite activities for introducing expected outcome (probability) and exponential functions that I have used with my Yr 9 & 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 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 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*

**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*
*Repeated as E45*

### I47  The Senior Mathematics Class Can Be Fun Too
*Lorna McClory - Staughton 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*
*Repeated as H44*

### I48  Bisection Method & Newton's Method
*Brian Stokes - Monash University, VIC*

**Lecture**                                               **Years 11 to 12**
In the current VCE Mathematics Study Design (2016-2018) for the subject Mathematical Methods, additional algebra 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 J43*

### I49  Harmony In Polynomials
*Dr Ray Williams - St Mark's Anglican Community School, VIC*
*Peter Flynn - Texas Instruments, VIC*

**Workshop**                                               **Years 11 to 12**
What has the harmonic series got to do with adding progressive roots to a polynomial? The more roots, the steeper the tangent to the curve at zero! This session investigates the above relationship with interesting results.
*Keywords: Algebra/Algorithmics*
*Not Repeated*

# 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*

### I-J4  Implementing Computer-Based Exams For VCE Mathematical Methods
*Rohan Barry - Wodonga Senior Secondary College, VIC*
*Terri Gregotski - Wodonga Senior Secondary College, VIC*
*Ian Berryman - Wodonga Senior Secondary College, VIC*

**Computer Workshop**                                               **Years 7 to 12**
*Commercial Presentation*
Wodonga Senior Secondary College Methods students, for the first time ever, will sit Exam 2 on computer in 2016. No, not just computations – the entire exam is to be done on screen! Come and discover teaching with Mathematica – how it works, how we use it as a teaching and assessment tool, what it changed in our classrooms and what stayed the same. We'll take you on a whistle-stop tour of our journey, but then it's over to you: learn how you could use Mathematica in our "maximum play-time" double session.
*Notes: Mathematica will be installed on the desktops in your session. Just bring yourself!*
*Keywords: Assessment/Technology*
*Not Repeated*

### I-J5  Mathematica For Mathematics Teachers - How To Create Tests, Worksheets And More
*John Fitzherbert - Ivanhoe Girls Grammar School, VIC*

**Computer Workshop**                                               **Years 9 to 12**
This session will be a hands-on workshop looking at how to create documents for use in class that include simple and complex graphics, equations and (if time permits) interactives. No previous experience required.
*Notes: Bring a USB to save all your work afterwards.*
*Keywords: Technology*
*Not Repeated*

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

### J1  Challenging Tasks For The Early Years (Foundation - Year 2)
*Nadia 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 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 C1*

### J3 Moving Maths
*Elise Mackie - Derrimut Primary School, VIC*
*Ben Kelso - Derrimut 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 math 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. 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 D6***

### J6 Immersed 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 this model. This presentation will provide details of how we have structured classes; our timetable; feedback and comments from students, parents, and teachers; impact on student learning and engagement; positives and negatives; and overall impressions and experiences from the past two years.

***Keywords: Innovative Models/Leadership***
***Repeated as E6***

### 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**                                                        **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 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 Honnens - 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 don'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**
*Iqbal 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 Pichler - 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 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*

**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 always 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*

**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*

**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 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 E34*

**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 I26*

**J27    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*
*Repeated as H29*

**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*

**J29    Using Technology To Teach Statistics in Years 7 to 10**
*Tobias Cooper - De La Salle Revesby, NSW*

**Workshop**                                                                    **Years 9 to 12**
*Commercial Presentation*
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*

~~CANCELLED~~

**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*

**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*

**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*

**J33    STEM Activities In Astronomy**
*Stephen Broderick - St Ursula's College, QLD*
**Workshop**                                                    **Years 7 to 12**
Astronomy is an excellent vehicle for getting students engaged in STEM. In this workshop, several contemporary activities will be presented. These include: how to collect and analyse real time data from the FUNCUBE satellite. All that is required is an aerial and a Funcube Pro+ dongle connected to a computer. Currently over 3000 exoplanets have been discovered since ˈ1995. Their mass, orbital period and location of the exoplanet relative to the star's habitable zone (the Goldilock's zone) can all be determined from Doppler measurements from the star's wobble. The mathematics of pulsars and spectroscopy will also be investigated. Graphical calculators will be used throughout the workshop to investigate, display the data and make conjectures.
*Notes: These session uses TI-Nspire technology. Calculators will be supplied. You may also bring your laptop.*
*Keywords: STEM/Technology*
*Not Repeated*

**J34    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 D39*

**J35    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 D40*

**J36    Using Algorithms To Make Better Decisions**
*Kylie McColl - The University of Melbourne, VIC*
*Michael Kirley - 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**
*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 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 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 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** **Years 11 to 12**

In the current VCE Mathematics Study Design (2016-2018) for the subject Mathematical Methods, additional algebra 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 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 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

Derek Hurrell – A7, B17, C17, D12
Chris Hurst – B17, C17, D12
Thao Huynh – F7
Trish Jelbart – C22, D2
Brent Jewell – B42, I35
Gareth Jones – G40, H33
Ben Kelso – I2, J3
Jillian Kenny – D29, E33
Nazim Khan – C46, G50
David Kinnersley – I28
Michael Kirley – D42, J36
Tim Kitchen – D-E2
Michael Klinkert – B10, C10, D32
Jo Knox – H18
Jessica Koch – G9, H5
Pauline Kohlhoff – B20, C23
Richard Korbosky – D14, E4, G4, H14, I8
Adam Kruger – B32, H27
Hoi Yuen Hilary Lai – I41, J37
Dean Lamson – C49
Brian Lannen – I43
John Lawton – I8, J10
Averil Lee – H15, I14
Antje Leigh-Lancaster – E39
David Leigh-Lancaster – B45, H36
Christine Lenghaus – E19, J14
Simon Lewis – H38
Sharyn Livy – G16
Elizabeth Lonergan – C31, E30, G31, H26
Andrew Lorimer-Derham – E21, J15
Oliver Lovell – C48, I19, J45
Ian Lowe – B8, C30, D17, G36, I25, J24
Jim Lowe – D46, E34, H42, J25
Rhiannon Lowrey – B31, G34
Cassandra Lowry – G7, H4
Julian Lumb – D30, H30
Alastair Lupton – B50, G48
France Machaba – D44
Elise Mackie – I2, J3
Jan Mann – G21, H17
Sophie Matta – E39
Justin Matthys – C13, J11
Chris McCarty – I29
Peter McClive – I36
Lorna McClory – H44, I47
Kylie McColl – D42, J36
Karen McDaid – B15, E17
Sara McKee – B25, G27
Catherine McKenzie – H30
Leanne McMahon – E13
Heather McMaster – E25, J18
Kevin McMenamin – C40, D47, E46, H43, J41
Karen McMullen – D1, H1
Allason McNamara – B52, C49
Shona McRae – H15, I14
John Meng – D36, G39
Nadine Meredith – C3, G2
Nicole Merlich – C22
Sanjeev Meston – B-C7
Nur Syamsila Mohd Haris – B41, E42
Colleen Monaghan – G5
Robert Money – H39, I38
Emma Morris – C26, G26

Jessica Mount – E31, I22
Frank Moya – B-C8, D34, E43
Tracey Muir – F4
Joanne Mulligan – A4
William Murray – E28, J22
Deborah Murrell – B34, G37
Richard Myddleton – I45, J39
Vicki Nation – I28
Agathi Neal – E50, H47
Greg Neal – E50, H47
Wee Leng Ng – C39, E44
Stephanie Nitschke – H20
Karim Noura – B47, D40, I37, J35
Jude Ocean – I13, J13
Michael O'Connor – B12, I6
Shane O'Connor – H8, J9
Jim O'Neill – B24
Michael O'Reilly – C24, D24, G29, I-J2
Kathryn Palmer – B7, C9
Mary Papp – B52
Jodie Parsons – B13, F7, H10
Sabine Partington – B42, I35
Leith Pavlinovich – D41, H37
Catherine Pearn – C25, D21
June Penney – C1, G15, J2
Karen Perkins – D31, E35
Nicola Petty – D9, I9
Victoria Pichler – E28, J22
Cherie Pickering – B48, I39
Robyn Pierce – I44, J38
Chantelle Polkinghorne – C11, E12
Jonathan Pollock – H38
Burkard Polster – A1
Alan Power – D25, G30
Anne Prescott – B20, C23, D-E3
Shanna Rankin – E31, I22
Dena Reddan – H20
Yvonne Reilly – B13, F7, H10
Nicole Rheumer – G6
Martin Richards – B4
Angela Rogers – C14, H12
Pauline Rogers – D19, E14, G24
Tammy Roosen – C3, G2
Marty Ross – B39, D49, F1
Raymond Rozen – D51, E49, I33, J31
Vanessa Rule-Paddle – B38
Scott Rumble – B32, H27
Norrian Rundle – C24, D24, G29, I-J2
Phillip Sakellaridis – C34, G43
Peter Sanders – B23, G25
Jono Schmidt – E2, J4
William Seager – B49, H40
Katherine Seaton – B29, G32
Matt Sexton – A5
Alistair Shaw – H23, I20
Justine Shelley – B16, I11
Ian Sheppard – C45, D52
Fatimah Sheriffdeen – B5, E7
David Shigrov – I5, J7
Colin Shnier – E38, I30
Frances Sidari – C1, J2
Dianne Siemon – E22
Bill Simmalavong – H45

Pumadevi Sivasubramaniam – B41, C41, E42
Catherine Smith – D28, G14, I24
Joel Smith – B-C5
Jim Spithill – D19, E23, G24, I17
Andrew Spitty – E10, G11
Libbie Spohn – C6, G10
Paul Stenning – D28, G14, I24
Max Stephens – B25, C25, D23, E9, G27, H7, I19, J21
Brett Stephenson – H41, I42
Brian Stokes – I48, J43
Peter Sullivan – C7, E36, G14
Jenny Sutton – B34, G37
Paul Swan – A2, D5
Rick Swan – B27, D26
Philip Swedosh – C49
Syed Azman Syed Ismail – B41, E42
Wendy Taylor – B42, I35
Su Yin Tee – E29, G33
Leigh Thompson – G40, H33
Steve Thornton – B10, C10, D32
Linda Tilson – B45, H36
Dave Tout – B-C3, E23, I17
Dung Tran – D23, J21
Kristen Tripet – B10, C10, D3, H3
Paul Tuchtan – C21
Alice Turner – B1, I1
Russell Tytler – A8
Brett Van As – I23, J23
Giovanna Vardaro – B21, J19
Robert Vermay – E47, G47
Jennifer Vincent – B-C1
Rob Vingerhoets – A6
Callum Waite – J10
Emma Waite – J10
Kim Walker – E32
Nadia Walker – E1, I3, J1
Charlie Watson – C44, D48, G49, H46
Jane Watson – E26, G28
Ashley Wilis – G9, H5
Ann Williams – D-E1
Doug Williams – B3, C5, D10, E3, G19, H2, I-J3
Gaye Williams – E18, F8, J12
Ray Williams – E48, I49
Ian Wills – D35, I31
Leanne Wilson – C26, G26
Richard Wilson – C13, J11
Neale Woods – C38, H45, I40
Andrew Wrigley – B26, H25
Thomas Yeo – E37, G38
Alexander Young – C4, G3
Kim Shuyue Zhang – E29, G33
Xin Zhao – E9, H7