BACK TO THE FUTURE

THE MAV 52ND ANNUAL CONFERENCE

3 & 4 December 2015
La Trobe University, Bundoora

www.mav.vic.edu.au

THE MATHEMATICAL ASSOCIATION OF VICTORIA

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Special Note:

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.

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PROGRAM

THURSDAY 3rd DECEMBER

8:00am	-	5:00pm	Registration Open
8:00am	-	5:50pm	Exhibition Open
9:00am	-	9:10am	Welcome
9:10am	-	10:00am	Anniversary Lecture - Lily Serna
10:00am	-	10:30am	*Morning Tea*
10:30am	-	11:30am	Session A
10:30am	-	12:50pm	Session A-B
11:30am	-	11:50am	Change Over
11:50am	-	12:50pm	Session B
12:50pm	-	1:50pm	*Lunch*
1:50pm	-	2:50pm	Session C
1:50pm	-	4:10pm	Session C-D
2:50pm	-	3:10pm	Change Over
3:10pm	-	4:10pm	Session D
4:10pm	-	5:10pm	*Happy Hour*
7:00pm	-	10:30pm	Dinner

FRIDAY 4th DECEMBER

8:00am	-	4:30pm	Registration Open
8:00am	-	2:10pm	Exhibition Open
9:00am	-	10:00am	Session E
10:00am	-	10:45am	*Morning Tea*
10:45am	-	11:45am	Session F
10:45am	-	1:10pm	Session F-G
11:45am	-	12:10pm	Change Over
12:10pm	-	1:10pm	Session G
1:10pm	-	2:10pm	*Lunch*
2:10pm	-	3:10pm	Session H
3:10pm	-	3:30pm	Change Over
3:30pm	-	4:30pm	Closing Ceremony - Model Solar Car Challenge

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.

GENERAL INFORMATION

Conference Venue: La Trobe University
Kingsbury Drive
Bundoora Victoria

Parking: Carparks P3, P2 and P6 (Free for conference days)

KEYNOTE SPEAKERS:

- ◊ *Dr Amie Albrecht - University of South Australia, SA*
- ◊ *Dr Leicha Bragg - Deakin University, VIC*
- ◊ *Emeritus Professor Stephen Clarke - Swinburne University, VIC*
- ◊ *Dr Deborah King - The University of Melbourne, VIC*
- ◊ *Dr Roberto Ojeda - University of Tasmania, Australian Maritime College, TAS*
- ◊ *Burkard Polster - Monash University, VIC*
- ◊ *Marty Ross - VIC*
- ◊ *Dianne Siemon - RMIT, VIC*
- ◊ *Matt Skoss - Centralian Senior College, NT*
- ◊ *Professor Terry Speed - Walter & Eliza Hall Institute, VIC*
- ◊ *Professor Peter Sullivan - Monash University, VIC*
- ◊ *Dr Paul Swan - WA*

CONFERENCE OFFICE CONTACT:

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PH: 61 (0) 3 9380 2399
FX: 61 (0) 3 9389 0399
http://www.mav.vic.edu.au/conference

Cancellation Policy:

Participants who cancel their booking on or prior to Monday 9th November 2015 will receive a refund less a $25 administration fee. All cancellations MUST be in writing and include any documentation already sent out. NO REFUNDS are available after the 10th November 2015. Registration may be transferred to another person.

REGISTRATION INFORMATION

Registration Fees:

1. Session Registration	**1 Day**	**2 Days**
Member Metro	$ 248	$ 496
Member Non-Metro	$ 240	$ 480
Non-Member	$ 327	$ 654
Student	$ 123	$ 244

2. Conference Dinner (Thursday 3rd December) $ 89
3. Happy Hour (Thursday 3rd December) FREE to registered delegates
4. Lunch (1 per person, per day) FREE to registered delegates

All prices are inclusive of 10% GST.

**** SPECIAL CONFERENCE OFFER!!**

Select to attend 2 days of the conference for $654 at the non-member rate and we will include an individual membership for 2016 (valued at **$142**).

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.
3. Contact at school 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) - 1 Copy of the Conference Proceedings; morning tea for each day registered; 1 lunch voucher for each day registered; attendance at selected sessions; Happy Hour on Thursday 3rd 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 MONDAY 30th NOVEMBER 2015 AT 5:00PM

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:

- ◊ Ping’s Café Moat
- ◊ Life Skills Café
- ◊ Café Spice
- ◊ Mamak Noodles
- ◊ Fusion
- ◊ Café Expresso
- ◊ Vital@T
- ◊ Caffeine Café
- ◊ Charlie’s Kebab House
- ◊ Fuel Juice and Soup Bar
- ◊ Café Veloci

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 mixed stir fry veg with tofu with steamed rice, bottle of drink
2. Cold Lunch Box - Roast chicken and salad roll, vegetarian sushi, bottle of drink

Friday

1. Hot Lunch Box - Rainbow steak OR mixed stir fry veg with tofu with steamed rice, bottle of drink
2. Cold Lunch Box - Teriyaki chicken OR salad roll, vegetarian sushi, bottle of drink

Agora Square

Life Skills Café

1. Choice of one from a variety of wraps, slice, bottle 600ml water
2. Vegetarian quiche, slice, bottle 600ml water

Café Spice

Large serve combination of any two curries served with rice from a selection of 3 meat and 3 vegetarian curries, soft drink can/bottle of water/cup of mango lassi

Vegan options are available / Curries are gluten and nut free

Mamak Noodles

All noodle or rice box come with a can of drink or a bottle of water

1. Vegetarian OR Chicken satay with hokkien noodle or rice
2. Beef & vegetable with black bean sauce with hokkien noodle or rice
3. Teriyaki chicken & vegetable with udon noodle or rice
4. Special order from the full menu

Gluten Free available

Fusion

1. 2 Slices of pizza + small chip + potato cake and a hashbrown, can of soft drink, piece of seasonal fruit
2. All combo deal - hamburger OR souvlaki OR seafood basket, can of soft drink, piece of seasonal fruit
3. 2 chicken drumsticks or whole Maryland or lasagna + small chip + potato cake and a hashbrown, can of soft drink, piece of seasonal fruits

Café Expresso
Filled foccacia with a salad, small coffee/tea/water

Vital@T
Any baguette, turkish roll OR sandwich, drink, piece of fresh fruit

Caffeine Café
1. Gourmet baguette - vegetarian delight/smoked salmon, cream cheese & salad/chicken, avocado, mayo & salad
2. Gourmet wrap - vegetarian/falafel, garlic aioli & salad/chicken, avocado, bacon & salad
3. Homemade Vietnamese rice paper roll pack - vegetarian/pawn/teriyaki chicken (pack of 3 rolls)
4. 3 Homemade sushi - vegetarian/chicken/salmon/prawn/crab/tuna/tempura prawn/crispy chicken
5. Brown rice salad on Thursday (vegetarian Included) OR Quinoa salad on Friday (vegetarian Included)

PLUS regular drink - coffee, water, juice, can of soft drink, PLUS assorted fresh fruit OR melting moment

Charlie's Kebab House
Freshly made sandwich/wrap/roll including Thai grilled chicken and salad/falafel with tabouli and hummus (vegetarian)/chicken schnitzel with lettuce, cheese and mayo/BBQ chicken and salad
PLUS drink - bottle of water, fruit juice PLUS piece of fruit - apple, orange, banana

Fuel Juice and Soup Bar
1. Regular salad, small fruit salad, water
2. Large salad, small juice

Variety of salads to cater for vegetarians and gluten free

Café Veloci
Main meal + fresh fruit + cold drink + chocolate treat
Main Meals (with meat) - chicken schnitzel roll/roast chicken wrap/beef and salad roll/chicken & avocado pasta salad/Caesar salad/pizza/pasta
Main Meals (vegetarian) - falafel, tabouli and humus wrap/potato and egg salad/brown rice salad (gluten free)/pizza/pasta

HAPPY HOUR

DATE: Thursday 3rd December 4:10pm - 5:10pm
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.

CONFERENCE DINNER

DATE: Thursday 3rd December
7:00pm - 10:30pm
VENUE: Eagle Cafe, La Trobe University

"Come with me, my love. To see, the sea of love..."

It's the 1950's and the band is playing in the background as you dance the night away to some old school tunes. Dress up, dress down, but whatever you do... be cool...

The price $89 includes three course dinner, beer, wine, soft drinks, participation in evenings activities.

A bus will pick up dinner attendees from the Mantra at 6:45pm and then at the end of the evening at 10:30pm to return to the Mantra.

ACCOMMODATION

MANTRA BELL CITY, PRESTON
Located a short 10 minute drive from La Trobe University, this is a 4 star hotel. A shuttle bus will operate between Rydges 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: $76.00 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: $120.00 per Room/per Night

Option 3
1 Bed Manhattan Room
Simply stunning 1 Bed Manhattan offers 1 queen Rydges dream 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: $175.00 per Room/per Night

Option 4
2 Bed Manhattan Room
As per the 1 Bed Manhattan but with 2 queen Rydges Dream Beds

2 Bed Manhattan Room: $240.00 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: $45 Per Room/Per Night

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

Anniversary Lecture

Thursday 3rd December - 9:10am-10:00am, Agora Theatre

Back to the Future - Where's My Hoverboard?

Lily Serna - Mathematician, TV Personality

It's 2015, in the movie "Back to the Future", Professor Emmett Lathrop "Doc" Brown, Ph.D. takes Marty McFly into the future to save the world. There he discovers all kinds of ideas that have become reality, including the famous Hoverboard. Whilst the hoverboard has been made by man it is still not readily available to skateboarding enthusiasts.

So now in 2015 what do we think the future will look like? How will we teach? What will be the new things that will excite and encourage our students? Come along to hear a light hearted and inventive approach to "What will the future of teaching hold?"

Lily Serna is a mathematician with an unrivalled passion for education, and Science, Technology, Engineering and Mathematics Advocacy (STEM). In 2009, she completed a Bachelor of Mathematics and Finance and a Bachelor of International Studies at the University of Technology, Sydney.

She did an Honours year with a first class thesis in mathematics, with applications in biology. She has sat on the Board of the Australian Mathematical Sciences Institute for three years. In 2012 she was appointed Numeracy Ambassador for National Literacy and Numeracy Week.

However, Lily is best known for her media work: as the resident Numbers Expert on SBS's Letters and Numbers with David Astle and Richard Morecroft. She was also co-host of SBS's Destination Flavour with Adam Liaw, the 2010 winner of MasterChef, and Renee Lim, television presenter and doctor. Lily has also published a maths puzzle book named Lily's Numbers Puzzles.

Lily is a data scientist at Fairfax Media, specialising in building mathematical and statistical models. As part of her International Studies degree, Lily learnt French and spent a year studying at the University of Bordeaux, France. She also speaks some Arabic. Lily loves the outdoors and enjoys surfing, swimming and travelling.

CLOSING CEREMONY

Friday 4th December - 3:30pm-4:30pm, Agora Theatre

Model Solar Cars and Boats

The next iteration of the F–10 curriculum will be released in 2016 and will include: Critical and Creative Thinking, Ethical Capability, and Personal and Social Capability. Designing and building a model solar boat or car enables you to cover some of this curriculum in an integrated and meaningful way while enabling your students to apply their science and maths knowledge to solve problems, test hypotheses, record data and make decisions. We know that while at play students are naturally curious and resourceful, even the older ones. Questionnaire evidence indicates students are highly motivated by building a product which works and of course by competition, hence connecting theory to application and creating their own knowledge.

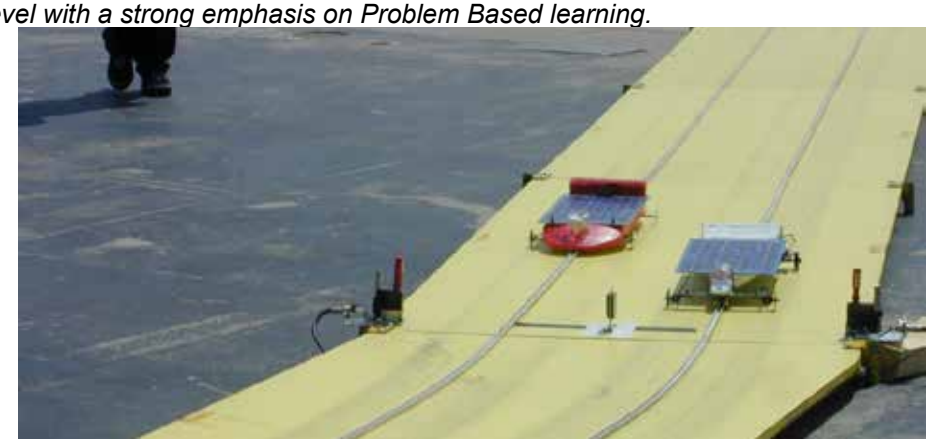
To design, make and test a working model, students need to work collaboratively; research to find information; apply their knowledge to address a problem; and be creative. They need to reflect on their model's performance and build their resilience and perseverance through the process of testing and improving their model. When knowledge is developed naturally through a task or activity, students come to see themselves as creative, as learners and as having the power to make a difference to their own lives.

Developing solar powered vehicles also enable students to reflect and gain knowledge on solar energy, optimizing energy efficiency and enables them to reflect on the practical and ethical considerations of power generation and the environment. Hands-on learning also helps to develop life-long learners, encourages positive attributes in learners and prepares individuals to meet the challenges of life and work. In this presentation we hope to give you the confidence to use a problem-based approach to teaching and addressing potentially unfamiliar subject material as you learn about model solar powered vehicles. Short videos of the event will be shown along with examples taken from mentors' experience with middle and upper primary and secondary groups. The use of a mathematical simulation for optimizing design will also be shown.

Paul Wellington
Chairman of the Victorian Model Solar Vehicle Challenge committee and former lecturer in materials, manufacturing and engineering management at Monash University. He was project manager of entries in the first 3 World Solar Challenges and one of the founders of the model solar challenge concept.

Ian Gardner
Mechanical engineer with over 40 years experience, has mentored a number of secondary and primary schools participating in both the car and boat events, and has generated most of the technical data on frequently used components. He worked with students at Box Hill High School in 2005 to produce a computer simulation of model solar car performance.

Dr Janet Di Pilla
Principal of East Brunswick Primary School and coordinator of model solar car and boat projects for 25 years and has interviewed competing teams about their learning for the last 10. She has taught Science and Maths at secondary level with a strong emphasis on Problem Based learning.



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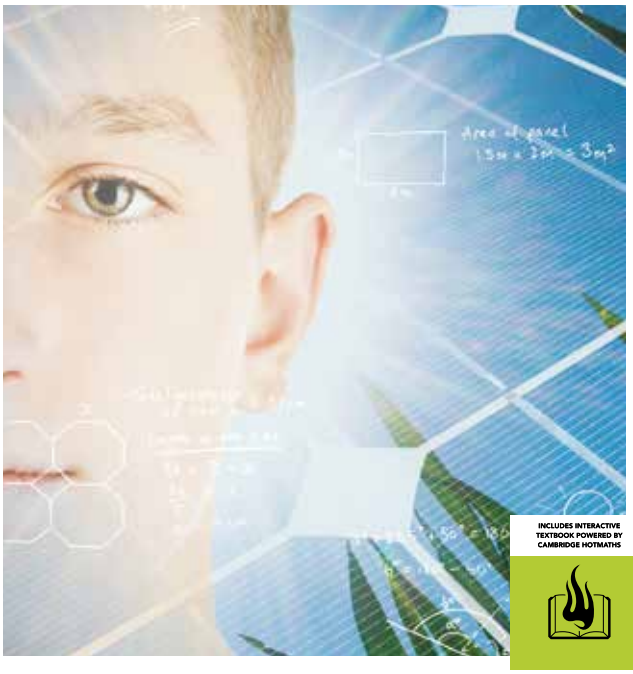

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Session Summary

SESSION A: 10:30am-11:30am Thursday 3rd December

AK1	3 to 10	Privileging Understanding and Prioritising Proficiency - Addressing the STEM Challenge - *Dianne Siemon*
AK2	4 to 12	Exploring Maths Problems with a Bit of Grit - *Matt Skoss*
A3	F to 1	Engaging Preppies - *Ivanka Vinski, Michelle Lopaticki*
A4	F to 4	Maths Intervention in the Early Years - *Deb Dodd, Leonie Riches, Kylie Clark*
A5	F to 6	Teaching and Differentiating Maths for Understanding - *Dr Ian Lowe*
A6	F to 6	Making the Most of the Maths in the Olympics - *Pam Hammond*
A7	F to 6	Engaging Students In Mathematics Using Picture Story Books - *Colleen Monaghan*
A8	F to 6	Planning for all 4 Maths Proficiencies - *Lisia Halton, Melissa Brown, Hayley Osborne*
A9	F to 6	TUNE ME IN, Short Sharp Maths Warm-ups to Get Your Lessons Rolling - *Tim Colman, Bree Collins*
A10	F to 7	Improving - *Anne Erskine*
A11	F to 10	Warping the Australian Mathematics Curriculum - *Michael O'Connor*
A12	F to 12	Career Development and Teaching Enrichmant Through Massive Open Online Courses (MOOCs) - *Dr Brenton Groves*
A13	1 to 2	Arithmetic and the Primary Mathematics Ruler - *John Lawton, John Exton*
A14	1 to 8	Mental Thinking in the Mathematics Classroom - *Richard Korbosky*
A15	2 to 4	From Counting Charts to Informal Strategies - *Ian Howard*
A16	2 to 6	Problem Solving Together – Using Assessment to Unlock Student Potential - *Cassandra Lowry, Marguerite McGrath*
A17	2 to 8	10 Tips and Tricks When Teaching Primary School - Number and Measurement - *Mike Ristovsky*
A18	2 to 9	Why I Don't Hate NAPLAN - *Tierney Kennedy*
A19	3 to 6	A Student-based Approach to Mathematics Assessment - *Stephanie Nitschke, Bridget O'Dwyer*
A20	3 to 6	Using Assessment Task to Guide Teaching and Learning - *Jennifer Bowden*
A21	3 to 8	Developing Multiplicative Thinking and Basic Facts Knowledge Using Array-based Materials - *Carol Efford, Annabelle Armstrong*
A22	3 to 8	Investigating Children's Multiplicative Thinking - *Dr Chris Hurst*
A23	3 to 8	Developing a Sense of Space: Working With Three-dimensional Solids - *Dr Rebecca Seah*
A24	4 to 7	Collaborative Problem Solving - *Christine Graham, Sue Pine*
A25	4 to 9	Using Instructional Games to Promote Understanding of Fraction Concepts and Processes - *George Booker*
A26	4 to 9	How to Teach Decimals Better - *Norrian Rundle, Michael O'Reilly*
A27	4 to 10	These 4 Visualisations Make Fractions Easy; Free Resource Pack - *Joel Smith, Justin Matthys*
A28	5 to 9	Learning and Teaching Together - Peer Mentor Numeracy Project - *Tina Fitzpatrick, Dr Dona Martin, Simon Turnbull, Vicki Mitchell, Ariana Te Arihi, Jasmin O'Sullivan, Adam Clusker, Jennifer Curtis, Elle Livingston, Brent Ritchie, Karen Smith*
A29	5 to 10	Proficiency Strands in a Content Strand - *Professor Derek Holton*
A30	5 to 11	ABC - 123. AMSI - BHP - CHOOSE MATHS. 1. Who Are We? 2. What Is It? 3. When, Where & How? - *Ann Kilpatrick, Kerrie Shearer*
A31	5 to 11	Using Technology to Make Formative Assessment Easier, Faster and More Effective - *Bruce Jackson*
A32	6 to 12	Day at the Museum (of Mathematics) - *Andrew Wrigley*, *Wally Brodar*
A33	6 to 12	Education Perfect Mathematics: Motivating Your Students to Excel in an Online Learning Environment - *Craig Smith*
A34	7 to 10	Made By Maths - An APP Developed by the MAV - *Ellen Corovic, Helen Haralambous*
A35	7 to 10	Managing Differentiated Learning Needs in the Maths Classroom - *Jennifer Nolan, Melinda Schumann*
A36	7 to 12	Unleashing the Power of the TI-Nspire CAS - Introductory Programming Made Easy - *Stephen Julian, Ray Cross*
A37	7 to 12	It's All About the Data - *Rodney Anderson*
A38	7 to 12	Whiteboarding in the Mathematics Classroom - *Dietmar Schaffner, Maria Schaffner*
A39	7 to 12	FX Draw - The Maths Teacher's Swiss Army Knife - *Paul Hooper*
A40	7 to 12	Improving Maths Outcomes Through the Use of Assessment Diagnostics - *Alexander Young*
A41	7 to 12	Teaching and Learning With a Digital Resource - Exploring Instructional Models and Feedback - *Catherine Mckenzie, Julian Lumb, Vanessa Rule*

Session Summary

A42	8 to 12	Maths Inside: Engaging Students in Maths by Using Real World Problems - *Dr Anne Prescott, Dr Mary Coupland*
A43	8 to 12	Mathspace - Leading the World in Adaptive Learning - *Mohamad Jebara*
A44	9 to 12	Make Your TI-Nspire More Dynamic and Interactive - *Frank Moya*
A45	9 to 12	Enhancing the Teaching and Learning of Mathematics Through TI-Nspire CAS - *Dr Wee Leng Ng*
A46	9 to 12	A Woman in STEM: Observations from Twenty Years in the Field - *Jude Alexander*
A47	10 to 12	Han Solo and Feedbacca - *Luke Bohni, Tristan Vale, Lisa Pizzol*
A48	10 to 12	New Study Design Content Using the Technology of the Casio ClassPad - *Kevin McMenamin*
A49	10 to 12	'Burn the Textbook' - Project Based Learning for VCE and VCAL - *Kara Fox, Duane Anderson, Kris Ellery*
A50	11 to 12	The Revised Core in Further Mathematics - *Russell Brown*
A51	11 to 12	Specialist Mathematics 2016 - What's in, What's out, What now? - *Peter Fox, Raymond Rozen*
A52	11 to 12	ClassPad Support for the New Specialist Mathematics - *Anthony Harradine*
A53	11 to 12	2016 Math Methods and Specialist Mathematics Courses - *Allason McNamara, Dr Philip Swedosh, Dean Lamson*
A54	11 to 12	How to Use Video Lessons and Performance Data to Improve VCE Results - Years 11 & 12 - *Ben Sze*
A55	12 to 12	University Mathematics as SAC Topics - *Joel Black*

SESSION A-B: 10:30am-12:50pm Thursday 3rd December

A-B1	K to 6	Nine & Over: Adventures in Place Value - *Douglas Williams*
A-B2	1 to 12	Using and Creating iTunes U Courses in Maths - *Kristi Usher, Clare Rafferty*
A-B3	3 to 7	Making the 4 Operations Happen for Students - *Rob Vingerhoets*
A-B4	7 to 12	Making Sense of Sensors: Building and Calibrating Sensors for Mathematics Investigations - *Colin Chapman*
A-B5	9 to 12	Exploring Circle Geometry: Functions Emerging from Data Capture - *Roger Wander*
A-B6	10 to 12	TI-Nspire Technology for VCE Mathematical Methods (CAS) New Study Design - *Sanjeev Meston*
A-B7	11 to 12	A Framework for Developing a Statistical Application Task for the New Further Mathematics Curriculum - *Professor Peter Jones*

SESSION B: 11:50am-12:50pm Thursday 3rd December

BK1	F to 12	Back is the Only Way to the Future - *Marty Ross*
B2	F to 3	Moving Maths! How to Recharge and Energise Your Mathematics Lessons! - *Johnny Alagappan*
B3	F to 4	Maths Intervention in the Early Years - *Deb Dodd, Leonie Riches, Kylie Clark*
B4	F to 6	Making the Most of the Maths in the Olympics - *Pam Hammond*
B5	F to 6	Class Structure of a Typical Day in Our School - *Paul Tuchtan*
B6	F to 6	TUNE ME IN, Short Sharp Maths Warm-ups to Get Your Lessons Rolling - *Tim Colman, Bree Collins*
B7	F to 6	Dice & Cards: Tools for Developing Fluency and Reasoning - *Ellen Corovic, Jennifer Bowden*
B8	F to 6	Improving Maths Outcomes Through the Use of Assessment Diagnostics - *Alexander Young*
B9	F to 9	What to Do When Kids Already Know Everything - Serious Maths Extension - *Tierney Kennedy*
B10	F to 10	Financial Numeracy – A Critical Context for Student Learning - *Shane O'Connor*
B11	F to 10A	Essential Assessment – AusVELS and Australian Curriculum Assessment and Curriculum Made Easy - *Andrew Spitty*
B12	F to 12	Teacher Supply and Demand: Is There a Crisis in Mathematics? - *Dr Paul Weldon*
B13	F to 12	Using Lego to Engage, Explore and Develop Rich Conceptual Learning Within the Maths Program - *Dianne Winbanks, Rob Deakin*
B14	1 to 7	Exploring the Big Ideas and Understandings in Measurement - *Trevor Saunders, Janine Simpson*
B15	1 to 12	Constructing and Delivering an Effective Maths Program - *Jodie Parsons, Yvonne Reilly*
B16	3 to 8	Where There is No Difficulty There is No Problem - *Dr Sharyn Livy*
B17	3 to 8	Investigating Children's Multiplicative Thinking - *Dr Chris Hurst*
B18	3 to 12	Just Mathematics - *Anthony Harradine*

Session Summary

B19	4 to 6	Fantastic Fractions - *Ian Howard*
B20	4 to 7	Collaborative Problem Solving - *Christine Graham, Sue Pine*
B21	4 to 10	Is Perfect Differentiation Possible? These Teachers Found a Way and Save Time - *Justin Matthys, Joel Smith*
B22	5 to 8	Getting into Gear - Conceptualising Ratio's - *Julia Tong, Suzanne Sinclair*
B23	5 to 8	APSMO Maths Games and Teacher Professional Development Courses Workshop - *Dr Anne Prescott, Jon Phegan*
B24	5 to 10	Bringing It All Together - *Ben Dennis*
B25	6 to 8	Algebraic Thinking in the Upper Primary and Lower Secondary School - Profile of a Challenging Program - *Ian Bull*
B26	6 to 9	Design and Implementation of a Project Based Learning Unit for Middle School Students in Measurement - From Conception to Delivery - *Rennae Miszkurka*
B27	6 to 12	… and Not a Textbook in Sight - *Ro Bairstow*
B28	6 to 12	The Classroom Organiser: Lesson Planning and Student Tracking Made Easy - *Bill Murray, Victoria Pichler*
B29	6 to 12	Statistics Learning Centre Videos and Resources Enrich Learning - *Dr Nicola Petty*
B30	7 to 10	A New Approach to Engaging Middle Year Students in Mathematics! - *Adam Kruger, Scott Rumble*
B31	7 to 10	Itching to Scratch - Block Based Programming in the Middle Years - *Jennifer Palisse*
B32	7 to 10	Classroom and Computer Games for Visual Algebra - *Dr Ian Lowe*
B33	7 to 10	Developmental Mathematics in 2015 - *Robert Yen*
B34	7 to 10	Engaging Students Through Formative Assessment – Instant Feedback! - *Shelley Cross, Karleigh Nicholls*
B35	7 to 12	Non-Intuitive Mathematics - *Ken Ellis, Rick Swan*
B36	7 to 12	Sources of Questions and Data - *Dennis Fitzgerald*
B37	7 to 12	Turning Engaging Mathematics Classroom Experiences Into Robust Learning - *Professor Peter Sullivan, Caroline Brown*
B38	7 to 12	Positive Education Applied to the Mathematics Classroom - *Steve Andrew*
B39	9 to 12	Google Drive and Google Forms in the Maths Classroom - *Hayley Dureau*
B40	9 to 12	From Shotgun Teaching to Differentiated Learning - Take Two - *Anthony Nunan*
B41	10 to 11	Numerical Solutions of Equations - A CAS Active Task - *Lindy Grahn, Meredith Plaisted*
B42	10 to 12	Further Maths Examinations This Year: How Useful Was the CAS Calculator? - *Kevin McMenamin*
B43	10 to 12	Mathematical Valuations - *Tessa Leigh-Lancaster, Dr David Leigh-Lancaster*
B44	10 to 12	'Burn the Textbook' – Project Based Learning for VCE and VCAL - *Kara Fox, Duane Anderson, Kris Ellery*
B45	11 to 12	ClassPad and the New 2016 VCE Mathematical Methods Exam - *Charlie Watson*
B46	11 to 12	The New VCE Mathematical Methods Study Enriched with TI-Nspire - *Frank Moya*
B47	11 to 12	The Revised Core in Further Mathematics - *Russell Brown*
B48	11 to 12	2014 Specialist Mathematics Examinations - *Allason McNamara, Dr Philip Swedosh, Dean Lamson*
B49	11 to 12	Dealing With the Tricky New Bits of General and Further Mathematics - *Dirk Strasser*
B50	11 to 12	Teaching the New VCE Mathematics Courses in a Connected Classroom - *Pauline Holland, Brent Ramsay, Shirly Griffith*
B51	12 to 12	Properties of the Product of Two Independent Cauchy Random Variables - *John Kermond*

SESSION C: 1:50pm-2:50pm Thursday 3rd December

CK1	10 to 12	The FYiMaths (First Year In Maths) Network - *Dr Deborah King*
C2	F to 6	Having Fun With Maths Card Games - *Richard Korbosky*
C3	F to 6	Unpacking the Proficiency Strands - *Kathryn Palmer*
C4	F to 6	Multiplicative Thinking - Using Action Research to Drive Professional Learning - *Melinda Williams, Cathy Davidson, Jan Morahan*
C5	F to 6	A Whole School Approach to Teaching Numeracy - *Narissa Leung, Gary Fry, Wendy Walsh*
C6	F to 6	Identifying Maths in the Murky World of Free Play Construction - *Cameron Lee, Jennifer Bowden*
C7	F to 6	enVisionMATHS Digital - *Sophie Matta, Antje Leigh-Lancaster*
C8	F to 8	Games From a Maths Kit - *Greg Butler, Leanne Cummings, Fiona Lindsay*
C9	F to 8	iPads as a Mathematics Learning Tool - *Fiorella Soci, Natalie Erwin*
C10	F to 10	Using Growth Mindset to Improve Student Attitudes to Maths - *Caroline Brown, Georgia Papadopoulos, Robert Tighe*
C11	1 to 12	Constructing and Delivering an Effective Maths Program - *Jodie Parsons, Yvonne Reilly*
C12	3 to 8	Using the Model Method to Assist Students to Solve Word Problems - *Lei Bao*

Session Summary

C13	3 to 8	Tasks and Resources for Developing Children's Multiplicative Thinking - *Dr Chris Hurst, Dr Derek Hurrell*
C14	3 to 10	Engaging Games to Develop Skills, Confidence and Higher Order Thinking - *Andrew Lorimer-Derham, Melinda Evans*
C15	3 to 10	Classroom and Computer Games for Visual Fractions - *Dr Ian Lowe*
C16	3 to 12	Using Edmodo, A Social Networking Application, With Your Mathematics Classes - *Angela Kotsiras*
C17	3 to 12	Technology Should Assist Teachers - Not Replace Them - *Joseph Wright, Joanna Tutos, Danielle Henderson*
C18	4 to 9	A Digital Toolbox for Teaching and Learning Maths - *Britt Gow*
C19	4 to 10	Improving Teaching with i-Screens - *Douglas Williams*
C20	4 to 12	Quo Vadimus? Observations of Australian Mathematics Education from Outside the Square - *Dr Michael Haese*
C21	5 to 8	Algebra as Storytelling - *Giovanna Vardaro, Bruce Henry*
C22	5 to 9	Fractional Thinking in the Middle Years as a Bridge to Algebraic Reasoning - *Catherine Pearn, Dr Max Stephens*
C23	5 to 10	Working With High-achieving Students - *Adjunct Professor Mike Clapper*
C24	6 to 8	Algebraic Thinking in the Upper Primary and Lower Secondary School - Profile of a Challenging Program - *Ian Bull*
C25	6 to 12	…and Not a Textbook in Sight - *Ro Bairstow*
C26	6 to 12	Education Perfect Mathematics: Motivating Your Students to Excel in an Online Learning Environment - *Craig Smith*
C27	7 to 9	CAS Calculators in the Middle Years Classroom (TI-Nspire CX CAS) - *Dianne Hayton*
C28	7 to 10	Improving Middle School Assessment - *Tricia O'Hara, Lydia Tomic*
C29	7 to 10	Card Games for Junior Secondary Maths - *Helen Haralambous*
C30	7 to 12	Evaluation of Pi and Other Mathematical Constants and Functions - *Leigh Thompson, Gareth Jones*
C31	7 to 12	Geometric Constructions Using TI-Nspire - *Mehmet Altundal*
C32	7 to 12	Using iPads in Mathematics Teaching - *Dennis Fitzgerald*
C33	7 to 12	Enhancing the Teaching and Learning Mathematics With Excel - *Karim Noura*
C34	7 to 12	Hang On. I've Got It! - *Dietmar Schaffner*
C35	7 to 12	Using a Tablet Computer In and Out of the Maths Classroom - *Peter Clerks, Paul Ryan*
C36	7 to 12	Using 3D Graphing Tools in FX Draw and FX Graph - *Paul Hooper*
C37	8 to 12	Maths Inside: Engaging Students in Maths by Using Real World Problems - *Dr Anne Prescott, Dr Mary Coupland*
C38	9 to 10	Sports Betting and the Pokies - *Robert Money, Donald Smith*
C39	9 to 10	Exploring Population Data with the TI iPad App - *Jeanette Fogarty, Marc Adam*
C40	9 to 11	Investigating Trinomials with Integer Roots - *Dr Ray Williams*
C41	9 to 12	Enhancing the Teaching and Learning of Mathematics Through TI-Nspire CAS - *Dr Wee Leng Ng*
C42	10 to 11	Numerical Solutions of Equations - A CAS Active Task - *Lindy Grahn, Meredith Plaisted*
C43	10 to 12	Han Solo and Feedbacca - *Luke Bohni, Tristan Vale, Lisa Pizzol*
C44	10 to 12	Further Mathematics 2016 - Problem Solving, Spreadsheets and Financial Modelling - *Rob Vermay*
C45	10 to 12	Worthwhile CAS Calculator Use in This Year's 2nd Methods Exam? - *Kevin McMenamin*
C46	11 to 12	ClassPad and the New 2016 VCE Further Mathematics Exam - *Charlie Watson*
C47	11 to 12	Empowering CAS Skills in Specialist Maths: Vectors, Circular Functions & Complex Numbers - *Trang Pham*
C48	11 to 12	Applications of Special Mathematics to Real Life Physics Problems - *Yuriy Verkhatsky*
C49	11 to 12	2014 Math Methods CAS Examinations - *Allason McNamara, Mary Papp*
C50	12 to 12	Taylor Polynomials and Approximate Integration - *Joel Black*
C51	12 to 12	5 Things Teachers Get Wrong During VCE Exam Revision - *Andrew Worsnop*

SESSION C-D: 1:50pm-4:10pm Thursday 3rd December

C-D1	5 to 12	Getting Started with Lua and TI-Nspire - *Dr Stephen Arnold*
C-D2	7 to 9	YOU SUNK MY SPACE SHIP! - *Hayden McQueenie*
C-D3	7 to 10	Using 'Algebra Tiles' to Teach Integers, Simplification, Expansion and Factorisation - *Norrian Rundle, Michael O'Reilly*
C-D4	7 to 10	Using an Online Virtual World to Teach Statistics Through Data Investigations - *Dr James Baglin, Professor Helen MacGillivray, Claire Hart*
C-D5	11 to 12	Recursion in General and Further Mathematics Courses - *Andrew Stewart*

Session Summary

C-D6 11 to 12 Using TI-Nspire CAS Technology in the Maths Methods (CAS) Classroom - *Hayley Dureau*

SESSION D: 3:10pm-4:10pm Thursday 3rd December

DK1 F to 2 Back to the Start: Key Numeracy Competencies in the Early Years - *Dr Paul Swan*
DK2 9 to 12 Engineering and Mathematics: An Ocean of Opportunity - *Dr Roberto Ojeda*
D3 F to 6 Unpacking the Proficiency Strands - *Kathryn Palmer*
D4 F to 6 Doing Maths is Awesome - iPads, Animation and Assessment - *Stephen Cadusch*
D5 F to 6 "It's About Managing Information" - Teaching Data and Statistics in Primary School - *Jacinta Blencowe*
D6 F to 6 Identifying Maths in the Murky World of Free Play Construction - *Cameron Lee*
D7 F to 6 Designing for Deep Learning Using the SOLO Taxonomy - *Jen Briggs*
D8 F to 8 Games From a Maths Kit - *Greg Butler, Leanne Cummings, Fiona Lindsay*
D9 F to 8 iPads as a Mathematics Learning Tool - *Fiorella Soci, Natalie Erwin*
D10 F to 9 Problem Based Learning and Incorporating Sugata Mitra's Research in Mathematics Teaching - *Julie Andrews*
D11 F to 10 Essential Maths for the Australian Curriculum, Cambridge Senior Maths and Cambridge HOTmaths - A Guide to Cambridge's Online Resources Powered by HOTmaths - *VJ Gunawardana*
D12 F to 12 Entrepreneurship: Linking Maths to the Real-World - *Tonia Ford*
D13 1 to 6 Check the Clues: Solving Word Problems - *David Dunstan*
D14 2 to 6 Problem Solving Together - Using Assessment to Unlock Student Potential - *Cassandra Lowry, Marguerite McGrath*
D15 2 to 10 Kids & Cup Cakes & Poster Puzzles - *Douglas Williams*
D16 2 to 12 Di-vision of Fun in the Inclusive Maths Classroom: Equal Sharing of Success - *Sabine Partington, Dr Wendy Taylor*
D17 3 to 6 Visualisation and Geometry Based on Vines - *Trevor Faure, Jennifer Bowden*
D18 3 to 9 Interactive Mathematics Tests for NAPLAN. Years 3, 5, 7, 9 - *Bill Healy*
D19 3 to 10 Classroom and Computer Games for Visual Calculations - *Dr Ian Lowe*
D20 4 to 6 Enrichment in the Upper Primary School - *Bruce Henry, Giovanna Vardaro*
D21 4 to 9 Hammer or Nail Gun? Add or Multiply. Choosing the Right Tool - *Christine Lenghaus*
D22 4 to 9 Using Scratch and Minecraft in Middle Years Maths Classes - *Britt Gow*
D23 4 to 12 The Teacher's Survival Guide to Using Wolfram|Alpha in the Classroom - *Craig Bauling*
D24 5 to 8 Sundials and Other Solar Instruments - *Tim Byrne*
D25 5 to 9 SMART Tests, Smart Teaching, Smarter Students - *Sara McKee, Dr Max Stephens*
D26 5 to 9 Developing Proportional Reasoning - *Lorraine Day, Dr Derek Hurrell*
D27 5 to 10 Statistics for Changing World: The Google Public Data Explorer - In Mathematics Classroom - *Iqbal Hossain, Rudy Birsa*
D28 5 to 10 Convergent & Divergent Thinking - *Adjunct Professor Mike Clapper*
D29 5 to 10 Made By Maths: An MAV App - *Ellen Corovic*
D30 5 to 12 Retaining Maths: How to Stop Your Students From Forgetting What They Learn - *Michaela Epstein, Andrew Worsnop*
D31 7 to 9 Boosting the Performance of High Achieving Students in Examinations Through Error Analysis - *Jane Irvin*
D32 7 to 10 Linear Equations and Correlations - An Authentic Introduction to Algebra - *Nathan Peterson, Emily Peterson*
D33 7 to 10 The Next Big Thing - Collaborative Online Courses - *Shirly Griffith, Pauline Holland*
D34 7 to 12 Evaluation of Pi and Other Mathematical Constants and Functions - *Leigh Thompson, Gareth Jones*
D35 7 to 12 Non-Intuitive Mathematics - *Ken Ellis, Rick Swan*
D36 7 to 12 Demonstrating Desmos and Other iPad Apps for 7-12 Maths - *Bryn Humberstone, Chris McCarty*
D37 7 to 12 Mathematica: Learn Some Coding - *Ian Willson*
D38 7 to 12 iLearn:weLearn: Senior Maths to Maths for Intellectual Difficulties: A Productive School Partnership - *Brett Fitzsimmons*
D39 7 to 12 Managing Change: From Here to There, via Where? - *Samantha Horrocks*
D40 7 to 12 Lessons From CAS. What Can We Learn? What Can Our Students Learn? - *Martin Buchholtz, Peter Fox*
D41 7 to 12 STEM: Women Are All Over It (The Shirt) - *Dr Katherine Seaton*
D42 8 to 12 More Passionless Moments - *Bruce Ruthven*
D43 9 to 10 Sports Betting and the Pokies - *Robert Money, Donald Smith*
D44 9 to 10 Exploring Population Data with the TI iPad App - *Jeanette Fogarty, Marc Adam*

Session Summary

D45	9 to 12	Mathematica for Mathematical Methods Units 1 and 2 - *Rohan Barry, Dr David Leigh-Lancaster*
D46	10 to 12	Triangles, Cevians and Areas - *Raymond Rozen*
D47	10 to 12	An Introduction to 3D Graphing on the TI-Nspire - *Brian Lannen, Greg Barras*
D48	10 to 12	Using MATLAB in Secondary School Mathematics - *Dr Ian Thomson*
D49	10 to 12	ClassPad Activities: Using Technology to Support Mathematics Learning - *Andrew Pateman, Ian Sheppard*
D50	11 to VCAL	Implementing the New VCE Foundation Mathematics Study Design - *Claire Delaney, Andros Constantinou*
D51	11 to 12	Algorithmics (HESS) via Distance Education - *Neale Woods, Georgia Gouros*

SESSION E: 9:00am-10:00am Friday 4th December

EK1	F to 12	More Than Mathematics: Developing Effective Problem Solvers - *Dr Amie Albrecht*
EK2	9 to 12	Statistics Teaching: Looking Back and Forward Fifty Years - *Professor Terry Speed*
E3	K to 12	Making Maths300 Work for You - *Douglas Williams*
E4	F to 1	Engaging Preppies - *Michelle Lopaticki*
E5	F to 4	Maths Beyond the Four Walls - *Helen Baldock, Racheal Scales, Beth Galea*
E6	F to 5	A Flexible Approach to Number - *Peggy Ashton, Jennifer Vincent*
E7	F to 6	An Introduction Into Maths Talent Quest - *Andrew Noordhoff, Lauren Newton*
E8	F to 6	Planning for All 4 Maths Proficiencies - *Lisia Halton, Melissa Brown, Hayley Osborne*
E9	F to 6	Dice & Cards: Tools for Developing Fluency and Reasoning - *Ellen Corovic, Jennifer Bowden*
E10	F to 6	Improving Maths Outcomes Through the Use of Assessment Diagnostics - *Alexander Young*
E11	F to 7	Google “Maths” - Using Google Apps for Maths Learning and Teaching - *Mark Gleeson*
E12	F to 12	Volunteering in Tanzania - *Jenny Clark*
E13	2 to 8	A Revolutionary Approach to Teaching About Angles - *Dr Heather McMaster*
E14	3 to 10	Engaging Games to Develop Skills, Confidence and Higher Order Thinking - *Andrew Lorimer-Derham, Melinda Evans*
E15	3 to 12	Creating Interactive Digital Worksheets with Adobe Acrobat Pro - *Brian Chau, Dr Tim Kitchen*
E16	3 to 12	Intentionally Engaging - *Greg Carroll, Sara Borghesi*
E17	4 to 6	Enrichment in the Upper Primary School - *Bruce Henry*
E18	4 to 9	A Digital Toolbox for Teaching and Learning Maths - *Britt Gow*
E19	4 to 9	Exploring Symmetry with the Mathomat Template - *John Lawton, Richard Korbosky*
E20	5 to 9	Learning and Teaching Together - Peer Mentor Numeracy Project - *Tina Fitzpatrick, Dr Dona Martin, Simon Turnbull, Vicki Mitchell, Ariana Te Arihi, Jasmin O’Sullivan, Adam Clusker, Jennifer Curtis, Elle Livingston, Brent Ritchie, Karen Smith*
E21	5 to 8	My Students Don’t Know Their Tables! - *Norrian Rundle, Michael O’Reilly*
E22	5 to 8	Turning Straw into Gold - *Suzanne Sinclair, Julia Tong*
E23	5 to 8	APSMO Maths Games and Teacher Professional Development Courses Workshop - *Dr Anne Prescott, Jon Phegan*
E24	5 to 9	SMART Tests, Smart Teaching, Smarter Students - *Sara McKee, Dr Max Stephens*
E25	5 to 9	Spin Them Around - Rotational Activities in the Classroom - *Megan Piscioneri, Alisha Taylor*
E26	5 to 10	Proficiency Strands in a Content Strand - *Professor Derek Holton*
E27	5 to 12	Real World Data in the Palm of Your Hand - *Dr Stephen Arnold*
E28	6 to 12	Statistics Learning Centre Videos and Resources Enrich Learning - *Dr Nicola Petty*
E29	7 to 9	Check the Clues: Solving Word Problems - *David Dunstan*
E30	7 to 10	Every Student Learning Something Different - Calm or Chaos? - *John Rainbow*
E31	7 to 10	Fun with Functions Using Balloons and TI-Nspire - *Shelley Cross, Karleigh Nicholls*
E32	7 to 12	Visual, Digital and Dynamic Ways to Explore Algebra - *Peter Fox*
E33	7 to 12	Transformations of Functions Using Symmetry - *Brett Stephenson*
E34	7 to 12	Systematically Strengthening the Core Topics From Year 7 to 12 - *Bryn Humberstone, Kevin White, Sarah Wills*
E35	7 to 12	It’s All About the Data - *Rodney Anderson*
E36	7 to 12	Enhancing the Teaching and Learning Mathematics with Excel - *Karim Noura*
E37	7 to 12	Whiteboarding in the Mathematics Classroom - *Dietmar Schaffner, Maria Schaffner*
E38	7 to 12	FX Draw - The Maths Teacher’s Swiss Army Knife - *Paul Hooper*
E39	7 to 12	Essential Maths for the Australian Curriculum, Cambridge Senior Maths and Cambridge HOTmaths - A Guide to Cambridge’s Online Resources Powered by HOTmaths - *VJ Gunawardana*

Session Summary

E40	8 to 12	Beyond the Rational - *Professor Terence Mills*
E41	8 to 12	Going Round in Circles - *Jenny Curtis*
E42	8 to 12	Mathspace - Leading the World in Adaptive Learning - *Mohamad Jebara*
E43	9 to 11	Classroom and Computer Games for Visual Quadratic Functions - *Dr Ian Lowe*
E44	10 to 12	Geometry Expressions - What an Amazing Program - *Neale Woods*
E45	10 to 12	Around the World in 80 Days (or 60 Minutes) - A Function Exploration - *Stephen Julian*
E46	10 to 12	New Study Design Content Using the Technology of the Casio ClassPad - *Kevin McMenamin*
E47	11 to 12	New Mathematical Methods - *Anthony Harradine*
E48	11 to 12	How to Teach Maths Methods, If You Must - *Marty Ross*
E49	11 to 12	ClassPad and the New 2016 VCE Further Mathematics Exam - *Charlie Watson*
E50	11 to 12	How to Use Video Lessons and Performance Data to Improve VCE Results - Years 11 & 12 - *Ben Sze*
E51	12 to 12	University Mathematics as SAC Topics - *Joel Black*

SESSION F: 10:45am-11:45am Friday 4th December

FK1	F to 6	Let Me Tell You a Story About Children's Literature and the Mathematics Classroom - *Dr Leicha Bragg*
FK2	F to 12	The Mathematical Magic of the Simpsons - *Burkard Polster*
F3	K to 2	Working Mathematically with Infants - *Douglas Williams*
F4	K to 6	Maths 'N' Movement - Maths is Fun, When it's Physical! - *Rachel McCann*
F5	F to 2	Step by Step - Building Solid Maths Foundations from Day One - *Cathy Davidson, June Penney, Jenny Dockeary*
F6	F to 3	Moving Maths! How to Recharge and Energise Your Mathematics Lessons! - *Johnny Alagappan*
F7	F to 4	Maths Beyond the Four Walls - *Helen Baldock, Racheal Scales, Beth Galea*
F8	F to 5	A Flexible Approach to Number - *Peggy Ashton, Jennifer Vincent*
F9	F to 6	A Whole School Approach to Teaching Numeracy - *Narissa Leung, Gary Fry, Wendy Walsh*
F10	F to 6	Designing for Deep Learning Using the SOLO Taxonomy - *Jen Briggs*
F11	F to 7	Improving - *Anne Erskine*
F12	F to 10	Essential Assessment - AusVELS and Australian Curriculum Assessment and Curriculum Made Easy - *Andrew Spitty*
F13	F to 12	Eight 'Military' Maths Classroom Practices - *Dr Jude Ocean*
F14	F to 12	Cashtivity - collaborative real world learning - *Brad Mathews, Professor Leon Sterling, Nigel Quinlan*
F15	1 to 7	The Teaching and Learning of Basic Facts - *Janine Simpson, Trevor Saunders*
F16	1 to 8	Mental Thinking in the Mathematics Classroom - *Richard Korbosky*
F17	1 to 12	Reciprocal Teaching in Mathematics - *Thao Huynh, Yvonne Reilly, Jodie Parsons*
F18	3 to 6	Visualisation and Geometry Based on Vines - *Trevor Faure, Jennifer Bowden*
F19	3 to 12	Using Edmodo, A Social Networking Application, With Your Mathematics Classes - *Angela Kotsiras*
F20	3 to 12	Creating Interactive Digital Worksheets with Adobe Acrobat Pro - *Brian Chau, Dr Tim Kitchen*
F21	3 to 12	Technology Should Assist Teachers - Not Replace Them - *Joseph Wright, Joanna Tutos, Danielle Henderson*
F22	4 to 10	Is Perfect Differentiation Possible? These Teachers Found a Way and Save Time - *Justin Matthys, Joel Smith*
F23	4 to 12	Quo Vadimus? Observations of Australian Mathematics Education from Outside the Square - *Dr Michael Haese*
F24	5 to 8	Maths by 3D Design (3D Printer) - Design, Create and Test - *Daniel Avano, Murray Walker, David Perkins*
F25	5 to 10	Bringing It All Together - *Ben Dennis*
F26	5 to 10	How to Run a Bridge Building Competition - *Dr Peter McClive*
F27	5 to 11	ABC - 123. AMSI - BHP - CHOOSE MATHS. 1. Who are We? 2. What is It? 3. When, Where & How? - *Ann Kilpatrick, Kerrie Shearer*
F28	5 to 11	Using Technology to Make Formative Assessment Easier, Faster and More Effective - *Bruce Jackson*
F29	5 to 12	Real World Data in the Palm of Your Hand - *Dr Stephen Arnold*
F30	5 to 12	The Joy of Informatics - *Jan Honnens*
F31	6 to 12	More Mathemagical Marvels to Liven up Lessons - *Andrew Wrigley, Wally Brodar*

Session Summary

F32	7 to 9	Boosting the Performance of High Achieving Students in Examinations Through Error Analysis - *Jane Irvin*
F33	7 to 10	Eating Fish - And Learning How to Fish - *Alastair Lupton*
F34	7 to 10	Creating Balanced Assessment Tasks - *Dr Rohani Mohamad*
F35	7 to 10	Made By Maths – An APP Developed by the MAV - *Ellen Corovic, Helen Haralambous*
F36	7 to 10	Every Student Learning Something Different - Calm or Chaos? - *John Rainbow*
F37	7 to 10	Building a Differentiated 7 to 9 Mathematics Curriculum - *Sue Prosenica, Lauren Withers, Corrine Hall*
F38	7 to 12	Hang On. I've Got It! - *Dietmar Schaffner*
F39	7 to 12	Lessons From CAS. What Can We Learn? What Can Our Students Learn? - *Martin Buchholtz, Peter Fox*
F40	7 to 12	Teaching and Learning with a Digital Resource - Exploring Instructional Models and Feedback - *Vanessa Rule, Tim Carruthers*
F41	7 to 12	Improving Maths Outcomes Through the Use of Assessment Diagnostics - *Alexander Young*
F42	8 to 12	Going Round in Circles - *Jenny Curtis*
F43	9 to 11	Investigating Trinomials with Integer Roots - *Dr Ray Williams*
F44	9 to 11	Learning Experiences With Transforming Graphs - *Yew Fook Chan*
F45	9 to 11	Classroom and Computer Games for Visual Trigonometry - *Dr Ian Lowe*
F46	9 to 12	Google Drive and Google Forms in the Maths Classroom - *Hayley Dureau*
F47	9 to 12	Mathematica for Mathematical Methods Units 1 and 2 - *Rohan Barry, Dr David Leigh-Lancaster*
F48	10 to 12	Worthwhile CAS Calculator Use in This Year's 2nd Methods Exam? - *Kevin McMenamin*
F49	11 to 12	ClassPad and the New 2016 VCE Mathematical Methods Exam - *Charlie Watson*
F50	11 to 12	Empowering CAS Skills in Specialist Maths: Vectors, Circular Functions & Complex Numbers - *Trang Pham*
F51	11 to VCAL	Implementing the New VCE Foundation Mathematics Study Design - *Claire Delaney, Andros Constantinou*
F52	12 to 12	The Product and Quotient of Two Independent Cauchy Random Variables - *John Kermond*

SESSION F-G: 10:45am-1:10pm Friday 4th December

F-G1	3 to 7	Making the 4 Operations Happen for Students - *Rob Vingerhoets*
F-G2	5 to 11/VCAL	Having Some Fun with Numeracy and Maths - *Dave Tout*
F-G3	5 to 12	Beginning PowerPoint (2010) for the Mathematics Classroom - *Dana Frantz, Giovanni Liubicich*
F-G4	7 to 12	Visiting the Islands to Learn About Statistical Inference - *Dr Nicola Petty*
F-G5	7 to 12	Hands-On-Workshop for Mathematica Beginners - *Craig Bauling*
F-G6	11 to 12	Recursion in General and Further Mathematics Courses - *Andrew Stewart*
F-G7	11 to 12	A Framework for Developing a Statistical Application Task for the New Further Mathematics Curriculum - *Professor Peter Jones*

SESSION G: 12:10pm-1:10pm Friday 4th December

GK1	F to 6	Turning Engaging Mathematics Classroom Experiences Into Robust Learning - *Professor Peter Sullivan*
G2	F to 2	Step by Step - Building Solid Maths Foundations From Day One - *Cathy Davidson, June Penney, Jenny Dockeary*
G3	F to 4	Rotation Groups That Actually Work - *Tierney Kennedy*
G4	F to 6	Having Fun With Maths Card Games - *Richard Korbosky*
G5	F to 10	Number Talks: A Powerful and Enlightening Experience - *Jan Cavanagh*
G6	F to 10	Warping the Australian Mathematics Curriculum - *Michael O'Connor*
G7	F to 12	Volunteering in Tanzania - *Jenny Clark*
G8	F to 12	Teacher Supply and Demand: Is There a Crisis in Mathematics? - *Dr Paul Weldon*
G9	F to 12	Using Lego to Engage, Explore and Develop Rich Conceptual Learning Within the Maths Program - *Dianne Winbanks, Rob Deakin*
G10	1 to 7	Inquiring Into Data Collection and Representation with Primary Students - *Sarah Nasser, Mary Luatua, Kaelynne D'Cruz*
G11	1 to 12	Reciprocal Teaching in Mathematics - *Thao Huynh, Yvonne Reilly, Jodie Parsons*
G12	2 to 8	A Revolutionary Approach to Teaching About Angles - *Dr Heather McMaster*
G13	3 to 5	Exploring Card Games to Promote Fluency in Basic Number Facts - *Linda Baron*
G14	3 to 9	Adding and multiplying, In Your Mind - *Anthony Harradine*
G15	3 to 10	Robots Roaming Around Your Classroom? Why NOT? 10 STEM Computer Programming Ideas - *John Widmer, Werribee Secondary College Students*

Session Summary

G16	3 to 12	What is Flipped Learning all About and How Does Adobe Help? - *Dr Tim Kitchen, Brian Chau*
G17	4 to 6	Fantastic Fractions - *Ian Howard*
G18	4 to 8	No Textbook, No Topics, No Worries! - *Dr Wendy Taylor, Toby Mahoney, Natalie Cumming*
G19	4 to 9	Using Scratch and Minecraft in Middle Years Maths Classes - *Britt Gow*
G20	4 to 11	Make A Moke - *Douglas Williams*
G21	5 to 8	Maths by 3D Design (3D Printer) - Design, Create and Test - *Daniel Avano, Murray Walker, David Perkins*
G22	5 to 8	Creating Understanding in 'Data and Statistics' in the Middle Years - *Marcus Garrett*
G23	5 to 9	Fractional Thinking in the Middle Years as a Bridge to Algebraic Reasoning - *Catherine Pearn, Dr Max Stephens*
G24	5 to 10	Statistics for Changing World: The Google Public Data Explorer - In Mathematics Classroom - *Iqbal Hossain, Rudy Birsa*
G25	5 to 10	Working With High-achieving Students - *Adjunct Professor Mike Clapper*
G26	6 to 9	Design and Implementation of a Project Based Learning Unit for Middle School Students in Measurement - From Conception to Delivery - *Rennae Miszkurka*
G27	7 to 10	A New Approach to Engaging Middle Year Students in Mathematics! - *Adam Kruger, Scott Rumble*
G28	7 to 10	Eating Fish – And Learning How to fish - *Alastair Lupton*
G29	7 to 10	Improving Middle School Assessment - *Tricia O'Hara, Lydia Tomic*
G30	7 to 10	How to Teach Algebra to Secondary School Students - *Peter Collins*
G31	7 to 10	Increasing the Rate of Students' Learning When They're Starting Behind - *Troy Lowe*
G32	7 to 10	Managing Differentiated Learning Needs in the Maths Classroom - *Jennifer Nolan, Melinda Schumann*
G33	7 to 12	Using TI-Nspire's Memory in an Efficient Way - *Mehmet Altundal*
G34	7 to 12	Flirting With a Flipped Mathematics Classroom - *David Greenwood, Bryn Humberstone, Dr Rose Humberstone*
G35	7 to 12	Mathematica: Learn Some Coding - *Ian Willson*
G36	7 to 12	Managing Change: From Here to There, via Where? - *Samantha Horrocks*
G37	7 to 12	Using a Tablet Computer In and Out of the Maths Classroom - *Peter Clerks, Paul Ryan*
G38	7 to 12	Sources of Questions and Data - *Dennis Fitzgerald*
G39	7 to 12	Positive Education Applied to the Mathematics Classroom - *Steve Andrew*
G40	8 to 12	Beyond the Rational - *Professor Terence Mills*
G41	9 to 11	Learning Experiences With Transforming Graphs - *Yew Fook Chan*
G42	10 to 10	Teaching Year 10 Australian Curriculum Mathematics Through Technology - *Tim Grabovszky*
G43	10 to 12	Further Mathematics 2016 - Problem Solving, Spreadsheets and Financial Modelling - *Rob Vermay*
G44	10 to 12	CAS or Pen-and-Paper: Decisions for Selected Year 11 Problems - *Scott Cameron, Dr Lynda Ball*
G45	10 to 12	Further Maths Examinations This Year: How Useful Was the CAS Calculator? - *Kevin McMenamin*
G46	11 to 12	Calculus for the New, Revised and Updated Study Design - *Peter Fox, Shane Dempsey*
G47	11 to 12	Applications of Special Mathematics to Real Life Physics Problems - *Yuriy Verkhatsky*
G48	11 to 12	Making VCE Mathematical Methods Visual - *Dr Ian Lowe*
G49	11 to 12	Dealing with the Tricky New Bits of General and Further Mathematics - *Dirk Strasser*
G50	12 to 12	Taylor Polynomials and Approximate Integration - *Joel Black*
G51	12 to 12	5 Things Teachers Get Wrong During VCE Exam Revision - *Andrew Worsnop*
G52	7 to 12	Preparing Secondary Mathematics Teachers: A Review of Research - *Dr Gregory Hine*

SESSION H: 2:10pm-3:10pm Friday 4th December

HK1	7 to 12	Kicking Goals with Maths and Stats - Applications in Sport and Gambling - *Emeritus Professor Stephen Clarke*
H2	F to 6	Doing Maths is Awesome - iPads, Animation and Assessment - *Stephen Cadusch*
~~H3~~	~~F to 6~~	~~"It's About Managing Information" - Teaching Data and Statistics in Primary School - *Jacinta Blencowe*~~
H4	F to 7	What You "SEE" is What You "GET" - Visual Thinking and Learning - *Mark Gleeson*
H5	F to 9	Problem Based Learning and Incorporating Sugata Mitra's Research in Mathematics Teaching - *Julie Andrews*
H6	F to 10	The Measurement Mat is Marvellous for Enlightening the Mind - *Jan Cavanagh*
H7	F to 10	Financial Numeracy - A Critical Context for Student Learning - *Shane O'Connor*

Session Summary

H8	F to 12	Career Development and Teaching Enrichmant Through Massive Open Online Courses (MOOCs) - *Dr Brenton Groves*
H9	F to 12	Eight 'Military' Maths Classroom Practices - *Dr Jude Ocean*
H10	2 to 4	From Counting Charts to Informal Strategies - *Ian Howard*
H11	3 to 5	Exploring Card Games to Promote Fluency in Basic Number Facts - *Linda Baron*
H12	3 to 6	Using Assessment Task to Guide Teaching and Learning - *Jennifer Bowden*
H13	3 to 8	Using the Model Method to Assist Students to Solve Word Problems - *Lei Bao*
H14	3 to 8	Developing a Sense of Space: Working With Three-dimensional Solids - *Dr Rebecca Seah*
H15	3 to 9	Interactive Mathematics Tests for NAPLAN. Years 3, 5, 7, 9 - *Bill Healy*
H16	3 to 10	Menu Maths: A Model for Making Mathematicians - *Douglas Williams*
H17	3 to 10	Robots Roaming Around Your Classroom? Why NOT? 10 STEM Computer Programming Ideas - *John Widmer, Werribee Secondary College Students*
H18	3 to 12	What is Flipped Learning all About and How Does Adobe Help? - *Dr Tim Kitchen, Brian Chau*
H19	3 to 12	Intentionally Engaging - *Greg Carroll, Sara Borghesi*
H20	4 to 9	Hammer or Nail Gun? Add or Multiply. Choosing the Right Tool - *Christine Lenghaus*
H21	4 to 9	Using Instructional Games to Promote Understanding of Fraction Concepts and Processes - *George Booker*
H22	4 to 10	These 4 Visualisations Make Fractions Easy; Free Resource Pack - *Joel Smith, Justin Matthys*
H23	4 to 12	The Teacher's Survival Guide to Using Wolfram|Alpha in the Classroom - *Craig Bauling*
H24	5 to 8	Algebra as Storytelling - *Giovanna Vardaro, Bruce Henry*
H25	5 to 9	Fixing Misconceptions in Fractions Quickly and Making Sure They Stay Fixed - *Tierney Kennedy*
~~H26~~	~~5 to 9~~	~~Creating an Interactive Maths Trail - *Laura Barker*~~
H27	5 to 10	Convergent & Divergent Thinking - *Adjunct Professor Mike Clapper*
H28	5 to 12	Mathematics on OneNote - *Dr Ian Thomson*
H29	5 to 12	Retaining Maths: How to Stop Your Students From Forgetting What They Learn - *Michaela Epstein, Andrew Worsnop*
H30	5 to 12	Computer Programming in Mathematics - *Jan Honnens*
H31	6 to 12	The Classroom Organiser: Lesson Planning and Student Tracking Made Easy - *Bill Murray, Victoria Pichler*
H32	7 to 9	CAS Calculators in the Middle Years Classroom (TI-Nspire CX CAS) - *Dianne Hayton*
H33	7 to 10	Itching to Scratch - Block Based Programming in the Middle Years - *Jennifer Palisse*
H34	7 to 10	Maths and I - Authentic, Student-Orientated Tasks - *Nathan Peterson, Emily Peterson*
H35	7 to 10	Developmental Mathematics in 2015 - *Robert Yen*
H36	7 to 12	Using iPads in Mathematics Teaching - *Dennis Fitzgerald*
H37	7 to 12	Wisdom of the Crowds - *Brett Stephenson*
H38	7 to 12	La Trobe - Made by Maths - *Dr Katherine Seaton*
H39	7 to 12	Mathematics and Literature - *Dr Tom Petsinis*
H40	7 to 12	Using 3D Graphing Tools in FX Draw and FX Graph - *Paul Hooper*
H41	8 to 12	More Passionless Moments - *Bruce Ruthven*
H42	9 to 12	A Woman in STEM: Observations from Twenty Years in the Field - *Jude Alexander*
H43	9 to 12	From Shotgun Teaching to Differentiated Learning - Take Two - *Anthony Nunan*
H44	9 to 12	Calculus in One Easy Lesson - *Marty Ross*
H45	10 to 10	Teaching Year 10 Australian Curriculum Mathematics Through Technology - *Tim Grabovszky*
H46	10 to 12	ClassPad Activities: Using Technology to Support Mathematics Learning - *Andrew Pateman, Ian Sheppard*
H47	10 to 12	CAS or Pen-and-Paper: Decisions for Selected Year 11 Problems - *Scott Cameron, Dr Lynda Ball*
H48	10 to 12	The Art of Teaching Proof - *Professor Derek Holton, Sabine Partington*
H49	11 to 12	Algorithmics (HESS) via Distance Education - *Neale Woods, Georgia Gouros*
H50	11 to 12	Making VCE General and Further Mathematics Visual - *Dr Ian Lowe*
H51	11 to 12	Calculus for the New, Revised and Updated Study Design - *Peter Fox, Shane Dempsey*
H52	7 to 12	Preparing Secondary Mathematics Teachers: A Review of Research - *Dr Gregory Hine*

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SESSION DETAILS
SESSION A: 10:30am-11:30am Thursday 3rd December

AK1 Privileging Understanding and Prioritising Proficiency - Addressing the STEM Challenge
Dianne Siemon - RMIT, VIC

Keynote **Years 3 to 10**

Numerous public reports are pointing to the critical importance of STEM (Science, Technology, Engineering and Mathematics) to Australia's future but the number of students studying STEM subjects in senior years is declining and access to multiplicative thinking remains elusive to many. Building on what we know from research, this session will consider what is needed to turn this situation around to increase the life choices available to our young people and give them a realistic chance to participate in a STEM future. It will focus on the big ideas in number, ways to address the multiplicative gap in the middle years of schooling and the work of the Reframing Mathematical Futures II project, which is aimed at building a learning and teaching resource to support mathematical reasoning in Years 7 to 10.

Di Siemon is a Professor of Mathematics Education in the School of Education at RMIT University (Bundoora) where she is involved with the preparation of pre-service teachers and the supervision of higher degree students. Di is currently the Director of the Reframing Mathematical Futures project, which is working with 32 secondary schools nationally to develop an evidenced based teaching and learning framework for mathematical reasoning in the middle years. She is also actively involved in the professional development of practicing teachers, particularly in relation to the development of the 'big ideas' in number, the teaching and learning of mathematics in the middle years, and the use of rich assessment tasks to inform teaching. Di has directed a number of other large scale research projects including the Scaffolding Numeracy in the Middle Years Project (2003-2006), the Researching Numeracy Teaching Approaches in Primary Schools Project (2001-2003), and the Middle Years Numeracy Research Project (1999-2001). Di is a past President of the Australian Association of Mathematics Teachers and a life member of the Mathematical Association of Victoria.

AK2 Exploring Maths Problems With a Bit of Grit
Matt Skoss - Centralian Senior College, NT

Keynote **Years 4 to 12**

Having just enjoyed our 7th Annual Maths Enrichment Camp held at a remote school north of Alice Springs, a group of NT teachers have developed, with the support of now-retired research mathematician, Ian Roberts, a bank of interesting mathematical problems. These problems are offered at the Maths Camps in rotating 'worlds', where students explore the problems in cross-age and cross-school groups, accessible and challenging to students from Years 4 to 12. The structure of the Maths Camp will be shared, along with a selection of 'gritty' problems to explore. These problems, along with the conviviality of being on camp, have contributed strongly to the camp theme of 'fun, friendship & thinking!'

Matt Skoss is an experienced classroom teacher, currently teaching Mathematics at Centralian Senior College in Alice Springs, and is the Maths, Science Health/PE & Year 11 Coordinator. He has enjoyed several curriculum roles with a Maths and ICT focus for NT Department of Education. He has also worked as a consultant for schools across Australia, with a strong interest in supporting remote and country schools. Matt has a strong belief in making Mathematics accessible and highly visual to all students, making strategic use of digital tools to amplify student learning. Resources that might be useful for classroom teachers are uploaded to his Maths? No Fear! wiki at: http://maths-no-fear.wikispaces.com.

A3 Engaging Preppies
Ivanka Vinski - Deer Park North Primary, VIC
Michelle Lopaticki - Stevensville Primary School, VIC

Workshop **Years F to 1**

This workshop will focus on how to engage Foundation students through directed play based Mathematics in the first term of schooling. There will be hands-on components to the workshop that allow delegates to have the opportunity to experience practical activities that can be used in Early Years classroom programs. Ivanka and Michelle will share their journey through their participation in a network based professional learning in 2014 and how the learning they gained and the data available from the numeracy online has informed the activities chosen for their Foundation classroom programs.

Repeated as E4

A4 Maths Intervention in the Early Years

Deb Dodd - Baden Powell College Derrimut Heath Campus, VIC
Leonie Riches - Baden Powell College P-9, VIC
Kylie Clark - Baden Powell College P-9, VIC

Workshop **Years F to 4**

Three qualified EMU specialist teachers share how Baden Powell College caters for students below level in maths from P-4. How students are identified as requiring additional assistance, the core components of the EMU program, and how their ongoing monitoring is tracked over the Early Years is explained. Activities and tasks that match Critical Growth Points from the Maths Online Interview and move students from one point to the next will be demonstrated in workshops.

Repeated as B3

A5 Teaching and Differentiating Maths for Understanding

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years F to 6**

Ian has created a resource that links to many of the best ways to teach and learn mathematics with understanding for Years F to 6. You will sample some of the ICT and hands-on activities that help students to learn key topics, and see how to create unit plans that differentiate learning across a wide range of levels.

Not Repeated

A6 Making the Most of the Maths in the Olympics

Pam Hammond - ROPA Consultancy, VIC

Workshop **Years F to 6**

Teachers aim to embed school mathematics in relevant and engaging contexts. The Olympic Games provides an ideal opportunity for students to experience the use of maths content that they are learning to an event beyond the classroom in sporting and other contexts, as well as making connections across the curriculum. In this workshop we will see how most aspects of mathematics and the proficiencies can be included as part of a unit/program focusing on the Olympics.

Repeated as B4

A7 Engaging Students in Mathematics Using Picture Story Books

Colleen Monaghan - VIC

Workshop **Years F to 6**

Are you looking for ways to engage your students in Mathematics? This session will provide you with a variety of ideas for using picture storybooks to introduce math problems for your students to explore. We will investigate hands-on authentic tasks for you to take away and use with your students. These activities will allow you to see how easily picture storybooks can be used to teach the various maths concepts in a fun, meaningful and engaging way.

Not Repeated

A8 Planning for All 4 Maths Proficiencies

Lisia Halton - Roxburgh Rise Primary School, VIC
Melissa Brown - Roxburgh Rise Primary School, VIC
Hayley Osborne - Roxburgh Rise Primary School, VIC

Workshop **Years F to 6**

During this workshop we will explore the 4 Maths Proficiencies: Understanding, Fluency, Problem Solving and Reasoning. We will share our experience of maths planning, demonstrating the ways we incorporate all proficiencies in planning and teaching. We ask that you bring along a copy of a weekly maths planner to refer to during this session. You will walk away with a deeper understanding of the proficiencies and activities to support your teaching from Prep to Grade 6.

Repeated as E8

A9 TUNE ME IN, Short Sharp Maths Warm-ups to Get Your Lessons Rolling

Tim Colman - Stonnington Primary School, VIC
Bree Collins - Stonnington Primary School, VIC

Workshop **Years F to 6**

Commercial Presentation

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 for this interactive workshop!

Repeated as B6

A10 Improving

Anne Erskine - FUNdaBolt Learning

Workshop **Years F to 7**

Commercial Presentation

Imagine one set of cards that can be used in early years to teach number and quantity, in middle years addition, subtraction, place value and times tables and still be being used in the upper grades to consolidate number skills, teach strategic thinking and improve memory. Anne Erskine the creator of the FUNdaBolt cards is passionate about hands-on learning through games and fun. She will demonstrate how to use these cards in all year levels, to teach fundamental maths skills and bring excitement about numbers back in the classroom. “I really like playing these games. They are so much fun.” Georgia

Repeated as F11

A11 Warping the Australian Mathematics Curriculum

Michael O’Connor - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years F to 10**

A warp is a vertical thread that forms the basis of a weaving pattern. It is these vertical threads that hold the fabric together and give it form and structure. Similarly, there are vertical threads in mathematics that link together the horizontal layers of the yearly programs in a curriculum. This session will explore how the concepts of mathematics in the curriculum build on one another to produce a coherent and durable whole.

Repeated as G6

A12 Career Development and Teaching Enrichment Through Massive Open Online Courses (MOOCs)

Dr Brenton Groves - Independent Researcher, VIC

Lecture **Years F to 12**

MOOCs are seen as replacing tertiary education but statistics show a major area is career development for teachers. A wide range of programs are being programmed specifically for this sector up to a Master’s degree. Advantages and Disadvantages. There are large teaching resources designed to enrich teaching with the The Kahn Academy and Mathematica™. A Hyperlink Conference Proceedings copy is available to download the URLs contained in the literature search.

Repeated as H8

A13 Arithmetic and the Primary Mathematics Ruler

John Lawton - Objective Learning Materials, VIC

John Exton - Heathmont East Primary School, VIC

Workshop **Years 1 to 2**

Commercial Presentation

The new Primary Mathematics ruler (PMR) allows students to positively locate numbers from 1 to 30 on the ruler itself; and to leave a record of their strategy on the ruler for later reflection and discussion during class. The PMR design fuses a set of 30 traditional plastic cubes with a 300mm ruler, giving students greater freedom in their use of maths cubes. Designer John Exton will lead participants through a lesson modelled on his own teaching at grade 2. After working initially as students participants will then discuss how they might integrate PMR into their own teaching practice. The PMR is being developed by OLM for release in 2016, this session will use 3D printed models of the ruler.

Not Repeated

A14 Mental Thinking in the Mathematics Classroom

Richard Korbosky - WA

Workshop **Years 1 to 8**

In the classroom we are constantly asked to gain insights as to whether students understand the mathematics they are using. This session introduces participants to the ‘target number strategy’ that can be used with Year 1 to 8+ and beyond. The ‘target number strategy’ sets up organised activities which give students the opportunity to show how they mentally calculate, calculate in written form or calculate with a calculator. Mathematical ideas associated with the ‘target number strategy’ include whole numbers, money, decimal numbers, indices, perimeter, area and the four operations. Mathematics ideas in this session will be linked to the Australian Curriculum.

Repeated as F16

A15 From Counting Charts to Informal Strategies

Ian Howard - Charles Sturt University, NSW

Workshop **Years 2 to 4**

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.

Repeated as H10

A16 Problem Solving Together - Using Assessment to Unlock Student Potential

Cassandra Lowry - Lumen Christi Catholic Primary School, VIC

Marguerite McGrath - Lumen Christi Catholic Primary School, VIC

Workshop **Years 2 to 6**

This hands-on workshop aims to provide teachers with practical examples of how teacher and peer assessment can be used to support the development of students' mathematical knowledge and understanding. Building on the problem solving process, adapted from the work of George Polya, this workshop will demonstrate how teachers can engage students in mathematics lessons by giving them greater opportunities to take a key role in assessment practices. This ongoing assessment gathering allows for immediate feedback and helps the teacher to provide more targeted differentiation of the curriculum.

Repeated as D14

A17 10 Tips and Tricks When Teaching Primary School - Number and Measurement

Mike Ristovsky - Christ Church Grammar School, WA

Workshop **Years 2 to 8**

This session has been motivated by teaching my son primary school mathematics from a secondary school perspective. After teaching secondary mathematics for 24 years I have had the challenging task of teaching mathematics to a Grade 3. This session will look at topics such as times tables, Pascal's Triangle, area and fractions through the eyes of both an 8 year old and a secondary teacher. There will be plenty of hands-on activities, handouts and a website to use in your class. It is hoped that of the 10 tips and tricks on offer you will be able to use at least a few in your class on Monday.

Not Repeated

A18 Why I Don't Hate NAPLAN

Tierney Kennedy - QLD Association of Mathematics Teachers, QLD

Workshop **Years 2 to 9**

Have you ever thought that NAPLAN questions seem like they are deliberately designed to trick the kids? Have you ever railed against the narrowing of the curriculum and increasing push towards teaching to the test? Great teaching and NAPLAN improvements are not mutually exclusive - one causes the other. Find out how in this workshop and uncover patterns that will forever change the way you look at NAPLAN, then take notes back to run the workshop with your own staff.

Not Repeated

A19 A Student-based Approach to Mathematics Assessment

Stephanie Nitschke - St Therese Torquay, VIC

Bridget O'Dwyer - St Therese Torquay, VIC

Lecture **Years 3 to 6**

This presentation will explore the development of assessment processes that one school has taken to ensure assessment in Mathematics is purposeful to the student, parent and teacher, and builds upon students' intrinsic motivation for improvement. A focus on formative assessment and quality feedback to individual students has supported students to have confidence and a positive attitude towards their learning in Mathematics.

Not Repeated

A20 Using Assessment Task to Guide Teaching and Learning

Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 6**

Jennifer Bowden has worked with the teachers at St Mary's Primary School Williamstown to develop their teaching and learning program. The focus of 2015 has been on developing a teaching and learning schedule that informs and directs teaching and learning whilst catering for the individual requirements of students. This workshop will explore the Rich task presented to students along with competitions such as the AMT. We will discuss the logistics or providing a variety of assessments to students and the impact on teaching and learning programs.

Repeated as H12

A21 Developing Multiplicative Thinking and Basic Facts Knowledge Using Array-based Materials

Carol Efford - University of Canterbury, Christchurch New Zealand
Annabelle Armstrong - University of Canterbury, Christchurch New Zealand

Workshop **Years 3 to 8**

Structures and pattern are at the heart of learning multiplication (Mulligan and Mitchelmore 2009). This workshop will explore how children develop a contextual understanding of multiplication through using arrays. Some practical ideas about how to improve children's basic facts knowledge will be shared. This workshop would suit primary school and middle years students moving from thinking additively to thinking multiplicatively. However, teachers with more senior school children struggling with understanding the basics of multiplication, would find it useful as well.

Not Repeated

A22 Investigating Children's Multiplicative Thinking

Dr Chris Hurst - Curtin University, WA

Workshop **Years 3 to 8**

Multiplicative thinking is a 'big idea' of mathematics that underpins much of the mathematics learned beyond the early primary school years. This session reports on a recent study that utilised an interview tool to gather data about children's multiplicative thinking. Using a workshop format, we present the interview tool and some of the findings, as well as demonstrate how the tool can used in sections for planning, teaching and assessment. The session also emphasises the importance of developing deep conceptual understanding as opposed to the teaching of procedures and explores how some traditional metods may hinder the development of multiplicative thinking.

Repeated as B17

A23 Developing a Sense of Space: Working With Three-dimensional Solids

Dr Rebecca Seah - RMIT University, VIC

Workshop **Years 3 to 8**

As one of the content strands in the Australian Curriculum, geometry is linked to the development of spatial reasoning ability. This ability is essential for understanding the world we live in and achieve advancement in science, technology, engineering and mathematics. Despite its importance, school geometry is often characterised by the memorising of vocabulary and applying formulae in routine arithmetic calculations. This session focuses on ways in which activities can be used to engage children in visualising, creating and reasoning about three-dimensional solids, leading to the development of spatial sense.

Repeated as H14

A24 Collaborative Problem Solving

Christine Graham - Cognition Education, Auckland, New Zealand
Sue Pine - Cognition Education, Auckland, New Zealand

Workshop **Years 4 to 7**

This workshop is based on the work of Mary K Stein and Margaret Smith and outlines a framework for teaching collaborative problem solving. The '5 practices' identifies a set of instructional practices that will help teachers work towards higher expectations using students work as a launching point for discussions. Important mathematical ideas are brought to the surface, contradictions exposed and understandings developed and consolidated through mathematical discourse.

Repeated as B20

A25 Using Instructional Games to Promote Understanding of Fraction Concepts and Processes

George Booker - QLD

Workshop **Years 4 to 9**

This workshop will address the representations used to introduce fraction concepts - regional models, collections with a particular emphasis on number lines which are critical in the later primary and early secondary years. As Kepner noted in 2007 "Just as counters help anchor a mental image of a whole number, number lines show how a fraction can be inserted between any two fractions, allow comparisons and serve as measurement models for computation". A range of games will be used to develop full understanding of the concepts and lead to naming common fractions and renaming between improper fractions and mixed numbers.

Repeated as H21

A26 How to Teach Decimals Better

Norrian Rundle - VIC
Michael O'Reilly - VIC

Workshop **Years 4 to 9**

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.

Note: Bring along a USB stick for take home resources.

Not Repeated

A27 These 4 Visualisations Make Fractions Easy; Free Resource Pack

Joel Smith - Maths Pathway, VIC
Justin Matthys - Maths Pathway, VIC

Workshop **Years 4 to 10**

The concept of fractions is a tough one for many students. Most find basic visual models easy enough, but fall over as soon as it becomes abstracted. Often this is because students visualise fractions in a limited way; different embodiments are more useful for building different abstractions. We discuss how these models tie together and connect with higher level fractions knowledge. Participants receive a resource pack to make it easy to implement when back at school.

Repeated as H22

A28 Learning and Teaching Together - Peer Mentor Numeracy Project

Tina Fitzpatrick - La Trobe University, VIC
Dr Dona Martin - La Trobe University, VIC
Simon Turnbull - La Trobe University, VIC
Vicki Mitchell - La Trobe University, VIC
Ariana Te Arihi - La Trobe University, VIC
Jasmin O'Sullivan - La Trobe University, VIC
Adam Clusker - La Trobe University, VIC
Jennifer Curtis - La Trobe University, VIC
Elle Livingston - La Trobe University, VIC
Brent Ritchie - La Trobe University, VIC
Karen Smith - La Trobe University, VIC

Workshop **Years 5 to 9**

The work undertaken in numeracy workshops at La Trobe University capitalizes on pre-service teachers working as peer mentors across year levels. In an inclusive, judgement free environment, which promotes open dialogue, work undertaken in numeracy workshops at La Trobe university capitalizes on third year pre-service teacher practice. Our work demonstrates how to extend students' ability by assisting them to make meaningful connections to prior learning. We aim to build understanding of number for all teachers, through genuine discourse, and a non-threatening learning environment where all class members feel comfortable in being open and honest - all of which serves as a catalyst for deep learning.

Repeated as E20

A29 Proficiency Strands in a Content Strand

Professor Derek Holton - VIC

Workshop **Years 5 to 10**

We'll look at least one area of the Content Strand that can be complemented by the Proficiency Strand. The aim here is to give an example(s) to show that understanding, fluency, problem solving and reasoning can be made part of regular class work. However it may mean a slight change of gear regarding what might be expected by students in a maths lesson. This session will be offered on the two days of the conference but with a different activity each day.

Repeated as E26

A30 ABC - 123. AMSI - BHP - CHOOSE MATHS. 1. Who Are We? 2. What Is It? 3. When, Where & How?

Ann Kilpatrick - Australian Mathematical Sciences Institute (AMSI), VIC
Kerrie Shearer - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years 5 to 11**

In April of this year, AMSI (Australian Mathematical Sciences Institute) and BHP Billiton launched the CHOOSE MATHS program. The CHOOSE MATHS program will offer professional development in maths education, a support network for girls studying mathematics, encouragement of girls to undertake tertiary studies in mathematics and statistics and an awareness campaign to ensure young people are fully informed of the career opportunities available to them if they include mathematics and statistics in their degrees. This presentation will provide participants with full program details and enable access to free resources for teachers of mathematics. We warmly invite you to join with us and grow the impact of CHOOSE MATHS!

Repeated as F27

A31 Using Technology to Make Formative Assessment Easier, Faster and More Effective

Bruce Jackson - Leongatha Secondary College, VIC

Lecture **Years 5 to 11**

Significant research evidence in combination with practical classroom experience has highlighted the difficulties and complexities of implementing formative assessment in classrooms. Technology offers the potential to assist with formative assessment however in practice, the information provided may not be well suited to informing learning. Drawing from both practical classroom experience and academic research, this presentation provides insights and strategies to help teachers successfully implement formative assessment in their classrooms. It also explores the benefits technology can bring to this process and the key requirements for easier, faster and more effective implementation.

Repeated as F28

A32 Day at the Museum (of Mathematics)

Andrew Wrigley - Somerset College, QLD
Wally Brodar - Somerset College, QLD

Lecture **Years 6 to 12**

The Museum of Mathematics in New York is the only such Museum in North America. It is a cornucopia of Mathematics designed to inspire the minds of students (and adults). Enjoy some of the exhibits, ideas and innovations from the museum which can be readily transferred to your classroom.

Not Repeated

A33 Education Perfect Mathematics: Motivating Your Students to Excel in an Online Learning Environment

Craig Smith - Education Perfect, New Zealand

Lecture **Years 6 to 12**

Commercial Presentation

Education Perfect is proud to be working with the New Zealand Qualifications Authority to deliver NZ's first online Maths Pilot Assessments. They have also built a powerful learning resource tailored to the Australian Curriculum. With Education Perfect Mathematics, students have the opportunity to learn, revise and be assessed using an online platform that is accessible from any device with internet access. The resource provides students with a relevant range of content and can be further customised to suit teachers' and students' specific needs. With engaging Smart Lessons, spaced repetition algorithm, task-setting and advanced reporting features, as well as world-wide competitions, Education Perfect Maths is building students towards success and lifelong learning. This is a showcase session that provides an in-depth demonstration of the Education Perfect Maths program and introduces you to strategies for how to make the most of Education Perfect in your school.

Note: Bring your own laptop - fully charged, bring a pen.

Repeated as C26

A34 Made By Maths - An APP Developed by the MAV

Ellen Corovic - The Mathematical Association of Victoria, VIC
Helen Haralambous - The Mathematical Association of Victoria, VIC

Workshop **Years 7 to 10**

Made By Maths is an interactive App developed by the MAV IN 2014. The App houses Mathematical Walks (or Trails). The current walk, Melbourne CBD based, is designed to be used by secondary students on city excursions. This session will demonstrate how to use the App and provide teaching tips and ideas for use back in the classroom. Teachers will gain experience in using the App for themselves. Additional teacher tools have been built into the construction and these will be explored. Feedback from schools and teachers will be presented. MAV Commercial Product.

Note: Participants are requested to bring a smartphone or tablet to this workshop and download the App to their device prior to the workshop.

Repeated as F35

A35 Managing Differentiated Learning Needs in the Maths Classroom

Jennifer Nolan - Oxford University Press, VIC
Melinda Schumann - Oxford University Press, VIC

Lecture **Years 7 to 10**

Commercial Presentation

This session provides valuable suggestions on how to best manage the learning needs of students in a mixed-ability classroom. It includes an introduction to the features of the new Oxford 7-10 mathematics series MyMaths AusVELS Edition which has been specifically developed to support all students wherever and whenever learning happens: in class, at home, with teacher direction or in independent study. You will be guided through the comprehensive range of resources available in both print and digital forms - all designed to meet the differentiated learning needs of your students. Each participant will receive a copy of their choice of MyMaths AusVELS Edition Year 7, 8, 9 or 10/10a upon publication.

Repeated as G32

A36 Unleashing the Power of the TI-Nspire CAS - Introductory Programming Made Easy

Stephen Julian - Mandurah Catholic College, WA
Ray Cross - St Margaret's Anglican Girls School, QLD

Lecture **Years 7 to 12**

This session will look at showcasing the power of programming using the Program Editor on the TI-Nspire CAS. In a hands-on, no-jargon, user-friendly introduction, you will learn how to write and run your own simple functions and programs that work seamlessly as part of day-to-day CAS use. You will be given ideas on how you and your students can write programs that improve the understanding and develops the logic and reasoning of the individual courses being studied. No previous programming knowledge is necessary.

Note: Bring your own CAS if you wish, however a limited number of TI-Npsire CAS will be available to use during the session.

Not Repeated

A37 It's All About the Data

Rodney Anderson - Moreton Bay College, QLD

Workshop **Years 7 to 12**

Data is the most powerful and influential mathematical instrument in the world today! Google collects more than one billion pieces of data from their search engine, every day! For example, Google correlate provides an insight into just how powerful data can be. This workshop will explore ways to collect, distribute and analyse data in a time efficient and mathematically effective ways. Participants will receive prepared activities and worksheets and participate in rapid data collection activities.

Repeated as E35

A38 Whiteboarding in the Mathematics Classroom

Dietmar Schaffner - Penleigh and Essendon Grammar School, VIC
Maria Schaffner - Penleigh and Essendon Grammar School, VIC

Workshop **Years 7 to 12**

This workshop will explore the opportunities that whiteboarding offers as a pedagogical technique, particularly in mathematical problem solving. Participants will be led through some sample whiteboarding activities as well as the theoretical foundations that underpin the technique. The presenters will also reflect on how whiteboarding has improved their students' engagement, quality of discourse and setting out of solutions, as well as the immediacy and accuracy of the feedback they can offer their students. Although the sample activities will be taken from senior curriculum, they will have some application in the middle school.

Repeated as E37

A39 FX Draw - The Maths Teacher's Swiss Army Knife

Paul Hooper - Efofex Software, WA

Computer Workshop **Years 7 to 12**

Commercial Presentation

FX Draw is the mathematics teacher's complete toolkit. It can be used to draw anything, demonstrate items and solve problems. This session will show you the tools available and how to use them. Great for long time users or for new teachers who have the most to gain out of this comprehensive package for Windows and Mac.

Note: You will get the most from the session if you have FX Draw 5 installed on your computer.

Repeated as E38

A40 Improving Maths Outcomes Through the Use of Assessment Diagnostics

Alexander Young - Ingenious Technological Enterprises, TAS

Lecture **Years 7 to 12**

Commercial Presentation

The author collaborated with schools in three states to develop a 'world first' means by which teachers monitor the quality of their teaching in assessment for learning. This has enabled teachers to "change their lives and that of their students", or as a speaker at the ACEL 2012 conference put it; "The students in her school, on average, learn at twice the pace of the nation and at twice the usual depth". Teachers achieve this by using their school's photocopier as a high speed scanner providing forensic feedback on each student's learning needs. This has transformed teaching enabling huge productivity gains and improved teacher satisfaction.

Repeated as F41

A41 Teaching and Learning With a Digital Resource - Exploring Instructional Models and Feedback

Catherine Mckenzie - Pearson, VIC
Julian Lumb - Pearson, VIC
Vanessa Rule - Pearson, VIC

Workshop **Years 7 to 12**

Teaching and learning with a digital resource can provide feedback about your students' learning and your own teaching to inform the implementation of learning activities and instructional models like flipped learning; spaced vs massed practice; student self-paced learning; differentiation and mastery learning. This session will explore how the new generation of digital resources enables the integration of each of these models and how they allow increased teacher-student time, catering for individual differences and overall improved student outcomes.

Note: Participants will require a laptop or tablet able to connect to the wireless internet. Please note that this IS NOT A COMMERCIAL PRESENTIATION, even though we are from Pearson.

Repeated as F40

A42 Maths Inside: Engaging Students in Maths by Using Real World Problems

Dr Anne Prescott - University of Technology, Sydney, NSW
Dr Mary Coupland - University of Technology, Sydney, NSW

Workshop **Years 8 to 12**

Australia has a significant problem with engaging students to continue with mathematics, especially in Years 11 and 12. This presentation will demonstrate a case study and samples of the associated materials linking real world problems provided by CSIRO, with classroom activities for Years 8-12, designed by AAMT. UTS, AAMT and CSIRO are working together with a grant from the Commonwealth Government Australian Maths and Science Partnership Program (AMSPP).

Repeated as C37

A43 Mathspace - Leading the World in Adaptive Learning

Mohamad Jebara - Mathspace, NSW

Workshop **Years 8 to 12**

Not all adaptive learning is created equal. Many of today's 'adaptive' solutions consist of a limited content pool with a rules-based decision tree. These products may seem adaptive but are essentially pre-determined adaptive learning - a contradiction in terms. In this presentation I will assign a hand-written adaptive diagnostic test, the test will be personalised depending on your answers, and at the end of the session in the space of 45 minutes I will tell you all your strengths and weaknesses. You just need to bring a phone or tablet. Come and see why Sydney-based Mathspace is taking the US by storm with its adaptive learning solution.

Repeated as E42

A44 Make Your TI-Nspire More Dynamic and Interactive

Frank Moya - Educational Consultant, VIC

Workshop **Years 9 to 12**

In this hands-on workshop, participants will use some under-utilised features of TI-Nspire CAS to create dynamic graphs and interactive computations. The functionalities that will be explored include the use of sliders, data capture and the 'Notes' application for interactive computation. Participants will come away from this session with ready-to-use activities which engage students in thinking mathematically. A mix of senior and middle school activities will be considered, and the skills gained by participants will be of value to all TI-Nspire users.

Note: Loan calculators will be available, if required. Alternatively, participants can use their own calculator or software, loaded with the latest operating system.

Not Repeated

A45 Enhancing the Teaching and Learning of Mathematics Through TI-Nspire CAS

Dr Wee Leng Ng - Nanyang Technological University, Singapore

Workshop **Years 9 to 12**

Handheld graphing technology, if used appropriately in the mathematics classroom, has the potential to enhance the teaching and learning of mathematics by empowering students to learn across different visual representations of mathematical concepts. With the aid of such technology, teachers have the means to help students develop a deeper understanding of abstract mathematical concepts and sharpen their critical thinking skills. In this workshop, participants will explore the use of the TI-Nspire CAS CX handheld in helping students develop relational understanding of concepts in calculus and statistics at upper secondary and pre-university levels.

Repeated as C41

A46 A Woman in STEM: Observations from Twenty Years in the Field

Jude Alexander - Australian Council for Educational Research (ACER), VIC

Workshop **Years 9 to 12**

Most people grow up with a basic understanding of traditional roles - doctor, blacksmith, candlestick maker, builder. But does the average student know what's involved in becoming a process operator, fly-in fly-out geologist or research project officer? There is broad agreement that we need more people, particularly women, working in science, technology, education and maths (STEM). However 50% of women terminate their STEM careers early, with a sense of frustration at the waste of time, energy and money. In this workshop, participants will gain a deeper understanding of the diverse range of STEM industries, including what the roles entail and what the culture is like, in order to prepare young people to engage fully with these industries.

Repeated as H42

A47 Han Solo and Feedbacca

Luke Bohni - John Monash Science School, VIC
Tristan Vale - John Monash Science School, VIC
Lisa Pizzol - John Monash Science School, VIC

Workshop **Years 10 to 12**

The JMSS Mathematics Faculty has been trialling the use of Google Scripts to provide their students with personalised, skills based feedback within the Solo Taxonomy framework. In this workshop, attendees will be introduced to the rationale and motivation behind developing this style of feedback, an introduction into what SOLO Taxonomy is and will also be given access to the Google Script used to provide the feedback to students with some instruction on how to use and modify it for their own purposes.

Note: Please bring your own laptop that is capable of connecting to the internet to this session so that you can access the example documents that we will be providing and using during the session.

Repeated as C43

A48 New Study Design Content Using the Technology of the Casio ClassPad

Kevin McMenamin - The Peninsula School, VIC

Workshop **Years 10 to 12**

The introduction of new content and techniques into Units 1-4 provides the perfect opportunity to explore their detail and use using technology. This will be a hands-on experience that will utilise the Spreadsheet, eActivity and statistics applications of the Casio ClassPad to model some of the new approximation techniques, sampling procedures and probability. Newton's Method, Bisection Method, Hypothesis testing and sample generation will be just a few of the new concepts featured. Come along and enjoy the experience.

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

Repeated as E46

A49 'Burn the Textbook' - Project Based Learning for VCE and VCAL

Kara Fox - Bendigo Senior Secondary College, VIC
Duane Anderson - Bendigo Senior Secondary College, VIC
Kris Ellery - Bendigo Senior Secondary College, VIC

Workshop **Years 10 to 12**

This session will explore some exciting alternatives to teaching maths from the textbook with senior classes. Project based learning, as the name suggests, gets students up out of their seats and exploring mathematical concepts from a group or project based perspective. It caters for students of all ability levels and incorporates different learning styles that can use more of our senses than just sight and sound. Some of the projects we will demonstrate will incorporate the exciting world of Geocaching, refresh your memory on the skill of knitting and release your inner child with a good old fashioned paper plane flying contest. Please bring along your sense of adventure to this session.

Repeated as B44

A50 The Revised Core in Further Mathematics
Russell Brown - Educational Consultant, VIC
Workshop **Years 11 to 12**
A hands-on workshop looking at key components in the new Further Mathematics core including explanatory and response variables, histogram scales data transformations, time series, recursion and financial modelling using the TI-Nspire CAS.
Repeated as B47

A51 Specialist Mathematics 2016 - What's In, What's Out, What Now?
Peter Fox - Texas Instruments, VIC
Raymond Rozen - RMIT University, VIC
Workshop **Years 11 to 12**
Ellipses are they in or out? As a complex question, they're out, as for Vectors they're in… but for algebra they're neither in nor out. Don't let this conundrum cause too much friction, because that's out too, unless it's a coplanar force of course. We'll spend some time testing hypothesis and will help you separate the variables, they're in for differential equations by the way… by providing lots of resources for you to use that should help clarify What's in and What's out. Session description Nspired by the writings of Lewis Caroll and Dr. Suess who by the way had no part in compiling the revised study design.
Note: Please bring your sense of humour, and leave derision and sarcasm at the door.
Not Repeated

A52 ClassPad Support for the New Specialist Mathematics
Anthony Harradine - Potts-Baker Institute, Prince Alfred College, SA
Workshop **Years 11 to 12**
This workshop will provide information on how the ClassPad II can be used to develop ideas that are new to the Specialist Mathematics course that are included in the 2016 - 2018 Study Design.
Note: BYO ClassPad if you can. Loan units will be available.
Not Repeated

A53 2016 Math Methods and Specialist Mathematics Courses
Allason McNamara - Mount Scopus Memorial College, VIC
Dr Philip Swedosh - King David School, VIC
Dean Lamson - Kardinia International College, VIC
Lecture **Years 11 to 12**
The main focus of the session will be Area of Study 6 Probability and Statistics for both courses: statistical inferences, linear combinations of random variables, sample means, confidence intervals for means and hypothesis testing.
Not Repeated

A54 How to Use Video Lessons and Performance Data to Improve VCE Results - Years 11 & 12
Ben Sze - Edrolo, VIC
Lecture **Years 11 to 12**
Commercial Presentation
Edrolo have partnered with the MAV to create the leading VCE resource for Methods and Further. Using a combination of interactive video tutorials and online exam simulation Edrolo allows teachers to drive better VCE results. Edrolo can be used for (1) exam revision, (2) SAC prep, (3) blended and flipped learning. This workshop will showcase how 200 schools are using Edrolo to improve the results of 25,000 students.
Repeated as E50

A55 University Mathematics as SAC Topics
Joel Black - Freelance Educator, QLD
Lecture **Years 12 to 12**
The evaluation of university mathematics topics as possible SAC topics is discussed. Various topics from sequences and series, complex analysis, differential equations, and integration theory are presented, with hints as to how these topics may be developed to link in with the Year 12 mathematics curriculum. The challenges of exploring these topics using CAS calculators will be touched upon. This presentation is intended for less-experienced teachers of Year 12 mathematics, but all are welcome.
Repeated as E51

SESSION A-B: 10:30am-12:50pm Thursday 3rd December

A-B1 Nine & Over: Adventures in Place Value

Douglas Williams - Mathematics Centre, VIC

Workshop **Years K to 6**

This workshop includes a range of rich, revisitable activities designed to continuously develop Place Value, rather than 'doing it' in a block for two or three weeks. This approach more closely reflects the evolution and discovery of Place Value through mathematical history by creating a student-centred investigative environment. Hands-on activities, largely drawn from Calculating Changes, and software from Maths300 will be used in ways which may be new to some teachers. Problem solving situations and the concept of working like a mathematician will be central. Samples of children's insights into understanding operations will be included.

Not Repeated

A-B2 Using and Creating iTunes U Courses in Maths

Kristi Usher - Ringwood Secondary College, VIC

Clare Rafferty - Ringwood Secondary College, VIC

Workshop **Years 1 to 12**

In this hands-on workshop, participants will gain an understanding of the power of an iTunes U course. Why and how to use iTunes U courses and learn how to create an iTunes U course for students on iPads. Courses work on Apple devices only - iPads and iPhones.

Note: Participants must bring a wireless enabled device (Eg. Laptop, iPad or Tablet) with up to date software to create a course. You will require an Apple ID and have an up to date browser: Safari 6 or later on Mac; Mozilla Firefox 12 or later, or Google Chrome 28 on Mac or PC. iPads need to be up to date with operating system and iTunes U App.

Not Repeated

A-B3 Making the 4 Operations Happen for Students

Rob Vingerhoets - RVEC, VIC

Lecture **Years 3 to 7**

For too many students the four operations are not much more than a bag of tricks that you either remember or you don't. This workshop brings the 4 ops back to place value and common sense and the methods/alternatives presented give students options that work for them - and you.

Repeated as F-G1

A-B4 Making Sense of Sensors: Building and Calibrating Sensors for Mathematics Investigations

Colin Chapman - Caroline Chisholm Catholic College, VIC

Workshop **Years 7 to 12**

This session will encourage participants to build, calibrate and test a light sensor and a temperature sensor from cheap componets. The sensors will be built around the Parallax Basic Stamp and the Arduino microcontrollers. Participants will calibrate their sensors using everyday standards and the curve fitting capabilities of a typical spreadsheet application. Participants will collect data using the sensors and use a variety of open source tools to process the data in order to enrich mathematics investigations. A variety of Inquiry ideas for Higher Order investigations in mathematics will be shared with the participants.

Note: Bring a charged laptop. The Chrome browser is recommended.

Not Repeated

A-B5 Exploring Circle Geometry: Functions Emerging from Data Capture

Roger Wander - MGSE, University of Melbourne, VIC

Workshop **Years 9 to 12**

In this workshop, participants will use TI-Nspire CAS software to explore relationships between measurement data (length, angle, area) which emerge when a previously static diagram becomes dynamic. Based in familiar circle geometry concepts, the rich set of data will be analysed for functional trends. The various features of Navigator used in the workshop will allow participants to develop ways their own classes might engage in meaningful formative assessment. Come along to see that there are more circle-Nspired functions than sine, cosine and tangent...

Note: TI-Nspire CAS CX handheld calculators will be available for participants' use during the session. Those who wish to bring their own may choose to do so; files used will be provided after the session upon request.

Not Repeated

A-B6 TI-Nspire Technology for VCE Mathematical Methods (CAS) New Study Design
Sanjeev Meston - Hillcrest Christian College, VIC
Computer Workshop **Years 10 to 12**
The purpose of the session is to upskill VCE and High School teachers with Version 4 of TI-Nspire CAS Technology. The session will target the Mathematical Methods course new Study Design and will be an opportunity to acquire necessary tools and resources to teach this course effectively.
Not Repeated

A-B7 A Framework for Developing a Statistical Application Task for the New Further Mathematics Curriculum
Professor Peter Jones - Swinburne University, VIC
Lecture **Years 11 to 12**
Developing a statistical application task for your Further Mathematics students can be a challenging task. This workshop introduces the data investigation process as a possible framework for developing a task that is purposeful, statistically meaningful and that enables a wide range of statistical skills to be assessed in one general context. Bring your own technology.
Repeated as F-G7

SESSION B: 11:50am-12:50pm Thursday 3rd December

BK1 Back is the Only Way to the Future
Marty Ross - VIC
Keynote **Years F to 12**

Let's travel back in time, decades back to when a quaint notion held sway: that mathematics education should be mathematical and educational. Let's go back to a world where numeracy meant arithmetic, not pointlessly opaque word problems; where proof was an intrinsic goal, not a microscopic aside; in which the C in VCAA stood for Curriculum rather than Crackpot. Let's go back to when schooling was about education rather than training, when it wasn't in the clutches of a testing-obsessed, techno-fetishistic, clueless bureaucratic cabal. Let's remind ourselves of how much better things used to be. Then, let's return to the present day, grab a jug of beer and drown our sorrows.

Marty Ross is a mathematical bum. Together with Burkard Polster he forms half of Melbourne's Maths Masters. Their many projects can be explored at qedcat.com.

B2 Moving Maths! How to Recharge and Energise Your Mathematics Lessons!
Johnny Alagappan - Gilson College, VIC
Workshop **Years F to 3**
Mathematical lessons at schools are often disconnected from reality and focus on abstract algorithms that put off students from Mathematics. Through structuring activities that tap into physical education as well as everyday problem solving activities, students can develop a passion and joy for Mathematical problem solving while developing critical thinking skills. In this workshop, I will be sharing some tried and tested methods that have worked extremely well with students with learning difficulties as well as those gifted in number skills. Whether you are starting off or have vast experience in teaching, these skills will transform your Mathematics lessons. Come and share in this interactive session and be prepared to have loads of fun!
Repeated as F6

B3 Maths Intervention in the Early Years
Deb Dodd - Baden Powell College Derrimut Heath Campus, VIC
Leonie Riches - Baden Powell College P-9, VIC
Kylie Clark - Baden Powell College P-9, VIC
Workshop **Years F to 4**
Three qualified EMU specialist teachers share how Baden Powell College caters for students below level in maths from P-4. How students are identified as requiring additional assistance, the core components of the EMU program, and how their ongoing monitoring is tracked over the Early Years is explained. Activities and tasks that match Critical Growth Points from the Maths Online Interview and move students from one point to the next will be demonstrated in workshops.
Repeated as A4

B4 Making the Most of the Maths in the Olympics

Pam Hammond - ROPA Consultancy, VIC

Workshop **Years F to 6**

Teachers aim to embed school mathematics in relevant and engaging contexts. The Olympic Games provides an ideal opportunity for students to experience the use of maths content that they are learning to an event beyond the classroom in sporting and other contexts, as well as making connections across the curriculum. In this workshop we will see how most aspects of mathematics and the proficiencies can be included as part of a unit/program focusing on the Olympics.

Repeated as A6

B5 Class Structure of a Typical Day in Our School

Paul Tuchtan - Balcombe Grammar, VIC

Workshop **Years F to 6**

The session will explore the lesson structure of any class in our school. We will look at a sample day/weekly and term planner, our assessment procedure and the type of activities we do on a typical day. Activities will be a cross section of Michael Ymer, Curriculum at Work, Dr Paul Swan, Jennifer Bowden, Maths 300 and Beam.

Not Repeated

B6 TUNE ME IN, Short Sharp Maths Warm-ups to Get Your Lessons Rolling

Tim Colman - Stonnington Primary School, VIC

Bree Collins - Stonnington Primary School, VIC

Workshop **Years F to 6**

Commercial Presentation

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 for this interactive workshop!

Repeated as A9

B7 Dice & Cards: Tools for Developing Fluency and Reasoning

Ellen Corovic - The Mathematical Association of Victoria, VIC

Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years F to 6**

Teachers will be elbow deep in dice and cards during this workshop. The session will focus on developing mathematical fluency and reasoning in students through the use of hands-on and engaging card and dice games. Teachers will be armed with a range of activities and we will explore how to easily differentiate them ready for a range of student learning needs.

Repeated as E9

B8 Improving Maths Outcomes Through the Use of Assessment Diagnostics

Alexander Young - Ingenious Technological Enterprises, TAS

Lecture **Years F to 6**

Commercial Presentation

The author collaborated with schools in three states to develop a 'world first' means by which teachers monitor the quality of their teaching in assessment for learning. This has enabled teachers to "change their lives and that of their students", or as a speaker at the ACEL 2012 conference put it; "The students in her school, on average, learn at twice the pace of the nation and at twice the usual depth". Teachers achieve this by using their school's photocopier as a high speed scanner providing forensic feedback on each student's learning needs. This has transformed teaching enabling huge productivity gains and improved teacher satisfaction.

Repeated as E10

B9 What to Do When Kids Already Know Everything - Serious Maths Extension

Tierney Kennedy - QLD Association of Mathematics Teachers, QLD

Workshop **Years F to 9**

When students excel in mathematics in primary school we tend to look for ways to slow them down, often resorting to punishing them with more and more questions that they can already answer. In this workshop teachers will explore practical alternatives for creating a challenging curriculum that excites and stimulates students requiring extension while also enabling teachers to effectively work with all students. Attendees will create tasks together and take away additional banks of tasks to use with their class.

Not Repeated

B10 Financial Numeracy - A Critical Context for Student Learning

Shane O'Connor - Victorian Curriculum and Assessment Authority (VCAA), VIC

Workshop **Years F to 10**

The MoneySmart Teaching Project is fast developing as the key source for new learning in financial numeracy. There is now a full sequence from F-10 of Mathematics units of work. The units cover all the required Mathematics skills, knowledge and understanding set out by AusVELS and the Australian Curriculum. All units have full assessment rubrics, and of course a full set of solutions to all activities! Teachers, as well as students, must develop greater skills in financial numeracy. It is critical! Current levels of financial numeracy are low amongst both young and older Australians, and the global issues with financial matters are of increasing concern to all Australians. All attendees will receive the 10 units of work currently developed. This workshop will also help schools commence that important journey to becoming a nationally highlighted MoneySmart School.

Repeated as H7

B11 Essential Assessment - AusVELS and Australian Curriculum Assessment and Curriculum Made Easy

Andrew Spitty - Essential Assessment, VIC

Lecture **Years F to 10A**

Commercial Presentation

Essential Assessment provides an easy and affordable way for Australian Primary and Secondary schools to deliver a consistent and whole school approach to AusVELS and Australian Curriculum numeracy assessment, curriculum and reporting. Essential Assessment delivers a whole school approach to formative and summative assessment for schools and delivers differentiated assessment and curriculum aligned to the content descriptions for each strand and sub-strand of the curriculum. The model assesses and develops student knowledge within each proficiency standard and delivers a differentiated curriculum for each student and class as a whole. Consistent school wide reporting is made easy with the Essential Assessment model delivering a reportable Australian Curriculum Level or AusVELS Progression Point for each student. www.essentialassessment.com.au

Repeated as F12

B12 Teacher Supply and Demand: Is There a Crisis in Mathematics?

Dr Paul Weldon - Australian Council for Educational Research (ACER), VIC

Lecture **Years F to 12**

I will present on what is known about the teacher supply and demand situation in Victoria generally, and mathematics teachers in particular. Data will include some new analysis of the Staff in Australia's Schools survey 2013 (on out-of-field teaching) and data from the most recent (2012-2013) Victorian teacher supply and demand report (for which I was lead author).

Repeated as G8

B13 Using Lego to Engage, Explore and Develop Rich Conceptual Learning Within the Maths Program

Dianne Winbanks - Inside the Brick, VIC

Rob Deakin - Inside the Brick, VIC

Workshop **Years F to 12**

Commercial Presentation

Use of LEGO® as a hands-on manipulative within the Primary and Secondary Maths Curriculum opens up an open ended realm of possibilities! LEGO® is a familiar and popular play toy that is sure to engage even the most reluctant student of maths. Teachers and students will discover the learning potential of even the most basic LEGO® elements. Through exploration, LEGO® can be utilised as a powerful tool in the development of rich conceptual understanding with an inquiry base. The use of LEGO® reinforces problem solving strategies while fostering the use of appropriate mathematical language, strengthening student ability to collaborate, communicate and inquire. This session would be appropriate for teachers of Primary school as well as Secondary School teachers in the middle years classroom.

Repeated as G9

B14 Exploring the Big Ideas and Understandings in Measurement

Trevor Saunders - Cognition Education, New Zealand

Janine Simpson - Cognition Education, New Zealand

Workshop **Years 1 to 7**

In this workshop we will explore the big ideas of measurement and we will define and examine the understandings that students need to have which support the big ideas. We will also look at activities which specifically develop the required understandings as students progress through the primary levels of school.

Not Repeated

B15 Constructing and Delivering an Effective Maths Program

Jodie Parsons - Sunshine College, VIC
Yvonne Reilly - Sunshine College, VIC

Lecture **Years 1 to 12**

What are the key elements and the non-negotiables which are critical to running an effective maths program? In this option we discuss how our highly effective maths program is structured and identify the aspects which are critical to its success and how we implement these at Sunshine College to ensure the maths education we offer is fully inclusive and suitable for all students. To collect resources from this presentation please download a free QR code scanner App on to an electronic device.

Repeated as C11

B16 Where There is No Difficulty There is No Problem

Dr Sharyn Livy - Monash University, VIC

Workshop **Years 3 to 8**

Good problems are challenging, have different methods of solution and might have more than one correct response. This workshop will explore a selection of problems that extend and stimulate students' mathematical thinking, understanding and problem solving skills.

Not Repeated

B17 Investigating Children's Multiplicative Thinking

Dr Chris Hurst - Curtin University, WA

Workshop **Years 3 to 8**

Multiplicative thinking is a 'big idea' of mathematics that underpins much of the mathematics learned beyond the early primary school years. This session reports on a recent study that utilised an interview tool to gather data about children's multiplicative thinking. Using a workshop format, we present the interview tool and some of the findings, as well as demonstrate how the tool can used in sections for planning, teaching and assessment. The session also emphasises the importance of developing deep conceptual understanding as opposed to the teaching of procedures and explores how some traditional metods may hinder the development of multiplicative thinking.

Repeated as A22

B18 Just Mathematics

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

Workshop **Years 3 to 12**

Just mathematics, come solve some problems just for your own enjoyment - forget the students for an hour. Suitable for - anyone who survived high school mathematics.

Note: Please bring paper, pen, calculator and your sense of humour.

Not Repeated

B19 Fantastic Fractions

Ian Howard - Charles Sturt University, NSW

Workshop **Years 4 to 6**

In this hands-on workshop you will learn how to use fraction number lines and counting charts to help students understand that fractions are a part of our number system. I'll show you how counting with fractions helps students learn some of the basic fraction concepts. You will also learn how to use a simple fraction kit to develop visual imagery and ideas of equivalence. We'll then add some fabulous, simple games to play with this kit. Finally you will learn how your students can use the kit to solve basic equations using the four operations.

Repeated as G17

B20 Collaborative Problem Solving

Christine Graham - Cognition Education, Auckland, New Zealand
Sue Pine - Cognition Education, Auckland, New Zealand

Workshop **Years 4 to 7**

This workshop is based on the work of Mary K Stein and Margaret Smith and outlines a framework for teaching collaborative problem solving. The '5 practices"' identifies a set of instructional practices that will help teachers work towards higher expectations using students work as a launching point for discussions. Important mathematical ideas are brought to the surface, contradictions exposed and understandings developed and consolidated through mathematical discourse.

Repeated as A24

B21 Is Perfect Differentiation Possible? These Teachers Found a Way and Save Time

Justin Matthys - Maths Pathway, VIC
Joel Smith - Maths Pathway, VIC

Lecture **Years 4 to 10**

Do your classes have 25 students with 25 different learning needs? Catering to this properly would take a superhero teacher, and none of us can differentiate perfectly on our own. A group of Australian teachers resolved to act as side-kicks for all those heroes by building Maths Pathway. Now, hundreds of teachers are catering to diversity more easily than ever before, and are saving time in marking and preparation. Now you can try it out free.

Repeated as F22

B22 Getting into Gear - Conceptualising Ratio's

Julia Tong - Cognition Education, New Zealand
Suzanne Sinclair - Cognition Education, New Zealand

Workshop **Years 5 to 8**

This workshop will look at the understandings that support the key ideas about ratios. We will also look at how we can contextualise the learning of ratios through the hands-on use of gears.

Not Repeated

B23 APSMO Maths Games and Teacher Professional Development Courses Workshop

Dr Anne Prescott - APSMO Inc, NSW
Jon Phegan - APSMO Inc, NSW

Workshop **Years 5 to 8**

This workshop introduces the APSMO Maths Games as part of the APSMO Maths Enrichment Program. APSMO Inc has been providing Maths Olympiad programs to schools in Australia and New Zealand since 1987 and this year has introduced the Maths Games program to provide the opportunity to all students in school Years 5 and 6. This session will show how Maths Games assists all Year 5 and 6 students and their teachers to improve mathematical problem solving abilities. By using five contests linked to specific problem solving strategies, students' enjoyment and enthusiasm for mathematics can be a major part of the maths program in schools. The APSMO teacher professional development courses assist teachers in their problem solving activities in the classroom. APSMO Inc. is a not-for-profit organisation.

Repeated as E23

B24 Bringing It All Together

Ben Dennis - Terang College, VIC

Lecture **Years 5 to 10**

In this presentation participants will hear about the experiences of Terang College as they have tranisitioned their 7/8 composite Mathematics classes into a paper less, team taught environment. Hear about the challenges of a highly differentiated classroom driven by effective use of data that incorporates the use of ICT (iPads), and where this is an emphasis on the individual and thinking process, rather than just academic skills. This session will highlight the journey one regional school has taken to increase student engagement and achievement in Mathematics including the successes and pitfalls discovered along the way.

Repeated as F25

B25 Algebraic Thinking in the Upper Primary and Lower Secondary School - Profile of a Challenging Program

Ian Bull - St Kevin's College, VIC

Lecture **Years 6 to 8**

I've aways believed that more advanced mathematical content can be taught to younger students aimed to stretch their understanding - it is a case of how it is packaged. At St Kevin's College I present Grade 6 boys with a range of experiecnces that connect algebra with geometry in a practical format, using iPad Apps and pen and paper which involve concepts beyond their years. We plot parabolas and derive Eulers rule for three dimensional solids as well as touching other content along the way. I will give out a full profile of the program including all powerpoint lessons and handouts to all participants.

Repeated as C24

B26 Design and Implementation of a Project Based Learning Unit for Middle School Students in Measurement - From Conception to Delivery

Rennae Miszkurka - Caulfield Grammar School, VIC

Lecture **Years 6 to 9**

It is said that Project based learning:

- ◊ Increases motivation to learn.
- ◊ Increases collaboration skills.
- ◊ Allows a variety of acceptable solutions.
- ◊ Expects learners to work with experts as required.
- ◊ Provides a student centered learning environment.
- ◊ Is built around real problems.

This session discusses the implementation of a Measurement PBL unit in Year 7 where students completed the "Big Task", drove their own learning, completed tasks in the order they chose, attended Masterclasses at the level students felt appropriate to their learning, gave peers feedback, collaborated with others, worked with 'coaches', while being guided by 'experts'.

Repeated as G26

B27 …and Not a Textbook in Sight

Ro Bairstow - King's College, Auckland, New Zealand

Lecture **Years 6 to 12**

In some of Ro's classes over the past three years, all students have had an iPad. He will describe how this has changed the way the classes are taught, and how the students learn, including feedback from the students. He will demonstrate some of the Apps he has found useful. He will show and make available some of the free resources he has created, including a content website for all upper primary and secondary years. Apps, games and interactive eBooks.

Repeated as C25

B28 The Classroom Organiser: Lesson Planning and Student Tracking Made Easy

Bill Murray - Mentone Girls Secondary College, VIC

Victoria Pichler - Full Circle Education, VIC

Lecture **Years 6 to 12**

Commercial Presentation

The Classroom Organiser is a unique cloud-based software system of lesson planning and student tracking. A whole year's set of lesson plans by topic and subject can be prepared at once to be used in classrooms, with students recording their progress against each lesson plan. The students' progress is automatically converted into a personal student tracker and reporting format that can be scrutinised in real time by the teacher, student and parents. It enables real time communication between parents, teachers and students, creating positive discussion about student progress.

- ◊ Creates lesson plans that contain teacher presentations and then individualised student work to be managed in a time effective manner and enabling student centred lessons to become a reality.
- ◊ Enables students to indicate to the teacher the level and standard of work they have completed, with a minimum of teacher intervention.
- ◊ Enables instant communication between teacher, student and parent about progression for that particular student, to allow individualised student programmes.

Note: Please bring your own computer and be prepared to log-in over the internet to access the system.

Repeated as H31

B29 Statistics Learning Centre Videos and Resources Enrich Learning

Dr Nicola Petty - Statistics Learning Centre, New Zealand

Lecture **Years 6 to 12**

Commercial Presentation

The internet abounds with resources for teaching statistics, but finding and evaluating them is time-consuming and it can be difficult to know what to use. In this workshop we will examine what to look for in resources, and how they can be used to enable learning and make better use of teachers' time. This will include theory behind multi-media learning and the concept of the 'flipped classroom'. About one half of this presentation will showcase the materials produced by Statistics Learning Centre. Statistics Learning Centre is the main provider of resources for teaching statistics in New Zealand high schools www.statslc.com.

Note: You are welcome to email help@statslc.com ahead of time for a teacher trial login.

Repeated as E28

B30 A New Approach to Engaging Middle Year Students in Mathematics!

Adam Kruger - Lyndhurst Secondary College, VIC
Scott Rumble - Lyndhurst Secondary College, VIC

Lecture **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 Star Program, a 7-9 Secondary Mathematics program, which we developed and implemented at our college. Throughout the session we will demonstrate how we motivate students to learning, create 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.

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

Repeated as G27

B31 Itching to Scratch - Block Based Programming in the Middle Years

Jennifer Palisse - John Monash Science School, VIC

Workshop **Years 7 to 10**

Scratch is a programming language which allows students to learn the skills of programming in a friendly and intuitive way. This session will explore ways in which Scratch can be used in the middle years mathematics classroom which allow students to develop mathematical concepts, as well as develop their resilience when dealing with problem solving tasks. This session is designed for the novice Scratch user and will allow for plenty time to play and learn/ practice with the program, while sampling some tasks that may be used directly in the classroom. Tasks which will be explored will include sequences and series, trigonometry and Pythagoras, plotting coordinates, and generalising patterns.

Note: Please bring your own laptop which can connect to the internet (or download Scratch prior to this session).

Repeated as H33

B32 Classroom and Computer Games for Visual Algebra

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 7 to 10**

This workshop will focus on ways of helping students to understand equation solving, expanding and factorising with hands-on activities and related computer games. Participants will engage in group activities and receive computer games for later use.

Not Repeated

B33 Developmental Mathematics in 2015

Robert Yen - Cengage Learning Australia, VIC

Lecture **Years 7 to 10**

Commerical Presentation

How do we reach students who don't like maths and who achieve little success in the subject? How can we do things differently in 2015? This workshop will be an opportunity to discuss practical classroom ideas and learn about ten clear strategies for improving student engagement and confidence. Discover how important it is to change the learning environment as well as to change the learning tasks. There will also be a preview of Developmental Mathematics 5th edition. This successful junior maths series that was first published in 1974 has been completely updated for the Australian curriculum.

Repeated as H35

B34 Engaging Students Through Formative Assessment - Instant Feedback!

Shelley Cross - St Hilda's School, QLD
Karleigh Nicholls - St Hilda's School, QLD

Computer Workshop **Years 7 to 10**

Get your class engaged through using technology to create customised quick quizzes across a range of platforms. This session will explore quizzes which create enthusiasm through competition, and those which give instant student feedback as well as collating data for teachers. It will demonstrate how to use a variety of internet based tools which can be utilised on Windows and Mac operating systems.

Note: Bring your laptop or iPad fully charged.

Not Repeated

B35 Non-Intuitive Mathematics

Ken Ellis - In-School Tutor Service, VIC
Rick Swan - Numeracy and Data Solutions, VIC

Lecture **Years 7 to 12**

Remember that element of delight when you are surprised by what the answer is, to what appeared to be a straight forward situation? That delight is what we aim to give you when you try out our collection of investigations. The activities will range from numeric to geometric to physical modelling, and will be accessible to a variety of levels and expandable to stretch even the most mathematically talented.

Note: Calculator/iPad may be useful.

Repeated as D35

B36 Sources of Questions and Data

Dennis Fitzgerald - Siena College, VIC

Lecture **Years 7 to 12**

Commercial Presentation

Where can we find data and questions to use in our teaching? There are many sources of data and questions that are available to us, both free and commercial. What can we leave for that extra that will contain all the resources that are needed? There are also specific topic sets of data - the AFL has a massive amount of data that can be analysed and more serious social data can be found on the Australian Bureau of Statistics website. A number of commercial examples will also be discussed.

Note: Bring your iPad with you to share ideas.

Repeated as G38

B37 Turning Engaging Mathematics Classroom Experiences Into Robust Learning

Professor Peter Sullivan - Monash University, VIC
Caroline Brown - Sacré Cœur, VIC

Lecture **Years 7 to 12**

There is now clear evidence that more challenging open-ended tasks engage all students in learning mathematics, including those who learn easily and those who find learning mathematics difficult. The next step is to convert those engaging experiences into flexible learning that can be transferred to other contexts. This session will outline key actions for teachers including articulating the relevant mathematics and the use of similar tasks to follow up and consolidate the learning activated by the initial challenge. Sequences of such tasks and the follow up will be presented.

Not Repeated

B38 Positive Education Applied to the Mathematics

Steve Andrew - Geelong Grammar School

Lecture **Years 7 to 12**

This interactive presentation will look at four ways in which the Science of Positive Psychology is applied to this teacher's Mathematics class. The intention is that it is practical as well as theoretical so that each person attending will leave with two techniques that can be used in their class immediately. It covers 'mindsets', 'character strengths', 'mindfulness' and 'gratitude'. There will be a number of exercise to illustrate the techniques. It will also discuss other aspects that could be useful in less detail and offer some challenges for us as teachers.

Repeated as G39

B39 Google Drive and Google Forms in the Maths Classroom

Hayley Dureau - Mount Waverley Secondary College/Texas Instruments, VIC

Lecture **Years 9 to 12**

In this workshop, participants will learn how Google Drive and Google Forms can be used to share resources (worksheet, revision material, solutions and videos) with students and collect feedback and formative assessment data. Feedback about student attitudes towards mathematics, attitudes towards CAS, aptitudes with CAS and perceived levels of mathematical understanding strongly influence subsequent teaching decisions and strategies. See how Google Forms allows you to seamlessly collect this data and use it to inform your teaching. At the completion of the workshop, participants will have sufficient knowledge of the various Google Forms question templates and analysis features to conduct illuminating surveys in their mathematics classrooms.

Note: It would be advantageous to have a laptop in the session and access to a Google account.

Repeated as F46

B40 From Shotgun Teaching to Differentiated Learning - Take Two

Anthony Nunan - St Patricks College, VIC

Lecture **Years 9 to 12**

After the interest shown in last year's presentation, Stop Shotgun Teaching, I have continued to develop the theory that differentiated learning is the best way for an average teacher to get exceptional results from their Year 12 students. My median for student Study Scores in 2012 was 30, and in 2013 it dropped to 29. In 2014 it was 34 with a rise in 40+ grades from 5% to 17%. I know you are thinking it was just because the students were smarter - but one statistic stood out. 25% of my students scored 2+ above their predicted GAT. Never had that happen before. A further 25% scored 5+ above their GAT prediction. That wasn't an accident. Fine tuning this year has involved Learning Analytics and Adaptive Learning solutions to help the small number of students who last year quietly managed to slip under the radar. No idea what my results will be this year with a much weaker cohort, but I'm happy to share.

Note: Bring along a device to make the most of the session.

Repeated as H43

B41 Numerical Solutions of Equations - A CAS Active Task

Lindy Grahn - Fintona Girls' School, VIC

Meredith Plaisted - Carey Baptist Grammar, VIC

Workshop **Years 10 to 11**

Given the introduction of the Bisection method and Newton's Method into the VCE Unit 1 and 2 Mathematical Methods CAS course, we thought that it would be appropriate to begin talking about numerical solutions in Year 10. We have developed a project that investigates both the bisection method and direct iteration to find numerical solutions. We wanted to use the CAS calculator as much as possible to reinforce some vital skills for Senior Mathematics. We have also incorporated use of the sequence application to create cobweb and staircase diagrams. Teachers can feel free to adapt the project to suit the needs of their own students.

Notes: Please bring your CAS calculator and a USB.

Repeated as C42

B42 Further Maths Examinations This Year: How Useful Was 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 the CAS calculator was in determining their answers. The ideas of pre-programmed material and hints that should be recorded in the bound reference to assist calculator functionality will be addressed. The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students. Time will also be given to identifying the questions that are time consuming in calculator use and would be better done by other means. The session is open to TI-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad.

Note: Bring along your own calculator. Some ClassPads will be avaialable for loan.

Repeated as G45

B43 Mathematical Valuations

Tessa Leigh-Lancaster - Westlink Consulting, VIC

Dr David Leigh-Lancaster - VCAA, VIC

Workshop **Years 10 to 12**

In this session we will explore the use of mathematics in the property industry with respect to valuations. The presenter completed VCE several years ago, including Further Mathematics and Mathematical Methods. She is an assistant valuer with a company that provides services in property consultancy, valuations and assess management for a municipal council. The use of mathematics in a ratings and taxation department is important for good quality valuations that are acceptable to property owners as part of valuation in a municipality. In this session we will consider several scenarios based on realistic data to illustrate how sales ratios, graphs and simple geometric planning are part of these processes. Spreadsheets will be used as enabling technology for data and related computations.

Note: Participants are encouraged to bring along a laptop or other device to access and work with sample data and tasks.

Not Repeated

B44 'Burn the Textbook' - Project Based Learning for VCE and VCAL

Kara Fox - Bendigo Senior Secondary College, VIC
Duane Anderson - Bendigo Senior Secondary College, VIC
Kris Ellery - Bendigo Senior Secondary College, VIC

Workshop **Years 10 to 12**

This session will explore some exciting alternatives to teaching maths from the textbook with senior classes. Project based learning, as the name suggests, gets students up out of their seats and exploring mathematical concepts from a group or project based perspective. It caters for students of all ability levels and incorporates different learning styles that can use more of our senses than just sight and sound. Some of the projects we will demonstrate will incorporate the exciting world of Geocaching, refresh your memory on the skill of knitting and release your inner child with a good old fashioned paper plane flying contest. Please bring along your sense of adventure to this session.

Repeated as A49

B45 ClassPad and the New 2016 VCE Mathematical Methods Exam

Charlie Watson - The Tuition Centre, WA

Lecture **Years 11 to 12**

This option will focus on the use of ClassPad in teaching and assessing Units 3&4 of Methods using the new study design in 2016, with a glance at preparatory work from Units 1&2 of the course. Participants will develop an awareness of key ClassPad skills that students of this course should develop and 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 let the ideas wash over you.

Note: You may choose to bring your own Casio ClassPad (old or new model) - a few available to loan on day.

Repeated as F49

B46 The New VCE Mathematical Methods Study Enriched with TI-Nspire

Frank Moya - Educational consultant, VIC

Workshop **Years 11 to 12**

This will be a hands-on workshop in which participants explore various functionalities of TI-Nspire that can be used to make selected topics in the 2016-2018 VCE Mathematical Methods study more meaningful to students, thereby enhancing conceptual understanding. Activities will include the use of simulations to investigate the distribution of sample proportions and confidence intervals. Simulations of this type could form the basis of modelling or problem solving SACs for the 'Probability and statistics' area of study. The use of numerical root-finding methods (bisection and Newton's method), specified in the 'Algebra' area of study for Units 1 and 2, will also be considered.

Note: Loan calculators will be available, if required. Alternatively, participants can use their own calculator or software, loaded with the latest operating system.

Not Repeated

B47 The Revised Core in Further Mathematics

Russell Brown - Educational Consultant, VIC

Workshop **Years 11 to 12**

A hands-on workshop looking at key components in the new Further Mathematics core including explanatory and response variables, histogram scales data transformations, time series, recursion and financial modelling using the TI-Nspire CAS.

Repeated as A50

B48 2014 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 11 to 12**

Allason, Philip and Dean will discuss common student errors in the 2014 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.

Not Repeated

B49 Dealing With the Tricky New Bits of General and Further Mathematics
Dirk Strasser - VIC

Lecture **Years 11 to 12**

Commercial Presentation

If you are teaching General or Further next year, there are a number of changes from the current courses that require particular attention. As the series editor and lead author of the new Nelson VCE Mathematics series, Dirk Strasser will lay bare the nuances and implications of the new Study Design for General and Further Mathematics, with concrete examples on how he dealt with new content.

Repeated as G49

B50 Teaching the New VCE Mathematics Courses in a Connected Classroom
Pauline Holland - Jacaranda, VIC
Brent Ramsay - Jacaranda, VIC
Shirly Griffith - Jacaranda, VIC

Lecture **Years 11 to 12**

Commercial Presentation

Are you teaching VCE Mathematics next year? With new courses to teach for all VCE Mathematics subjects next year, Jacaranda has a brand new suite of VCE resources which will maximise the opportunity for success for every student. Exciting new content, interactivities, 1000s of new questions, engaging CAS activities to introduce each new chapter, and StudyON, the complete examination and revision product that connects students with their teacher for immediate feedback and ongoing monitoring and support. This presentation will provide an opportunity for teachers to see and hear in detail the complete Jacaranda VCE package.

Note: Bring personal laptop or tablet.

Not Repeated

B51 Properties of the Product of Two Independent Cauchy Random Variables
John Kermond - John Monash Science School, VIC

Lecture **Years 12 to 12**

The probability density function (pdf) of the product of two independent Cauchy random variables that each have a median equal to zero is investigated. The usual properties of a pdf are verified by direct calculation. Asymptotes and removable singularities ('holes') of the pdf are also examined. It is proved that the mean does not exist and that the cumulative distribution function (cdf) is well-defined. This presentation is recommended for Mature Mathematical Audiences: It contains frequent strong mathematical language, mathematical equations and mathematical procedures.

Not Repeated

SESSION C: 1:50pm-2:50pm Thursday 3rd December

CK1 The FYiMaths (First Year In Maths) Network
Dr Deborah King - The University of Melbourne, VIC

Keynote **Years 10 to 12**

The FYiMaths network arose out of a national project (funded by the Australian Government Office for Learning and Teaching), which aimed to investigate the role of university academics whose main focus was teaching first-year tertiary mathematics. The project identified a number of the common challenges to effective teaching at university, the main one of these being how to deal with highly diverse student backgrounds. In 2014, conjunction with the AAMT and the Australian Council of Deans of Science, the project organised a conference which brought together leading teachers from the tertiary and secondary sectors, to discuss common issues in mathematics teaching at the Year 12 - first-year university interface. In this talk I will discuss the role that a network like FYiMaths could play in bringing about further joint activities like this and what can be gained from them.

Dr Deborah King is a lecturer in mathematics at The University of Melbourne. In 2007 she became Director of the Mathematics and Statistics Learning Centre, a role that entails the management of one of the largest university mathematics-teaching units in the country with 10,000 separate student enrolments. In 2012 she was appointed as Assistant Dean (Undergraduate programs) in the Faculty of Science and is now Coordinator of Learning and Teaching Innovation in the School of Mathematics and Statistics. Deborah has recently completed several national projects focused on mathematics education issues at tertiary level and now leads the national FYiMaths network of first-year tertiary mathematics educators. She has also recently established a mathematics education Special Interest Group within the Australian Mathematical Society.

C2 Having Fun With Maths Card Games

Richard Korbosky - WA

Workshop **Years F to 6**

Come along and have some fun! Get your students excited to learn, think and communicate mathematically with maths card games:: count, whole numbers, times and fractions. The card games are enjoyable, challenging and adaptable to different abilities and focus on ordering, addition, subtraction and multiplication. See how you can get students to practise basic facts, focus on mathematical language, and develop flexible and mental thinking strategies. Most of all see mathematical concepts in a variety of representations. We will discuss how teachers observation of students' conversations and justifications will identify misconceptions and direct future classroom planning of mathematics.

Repeated as G4

C3 Unpacking the Proficiency Strands

Kathryn Palmer - Every Child Counts Numeracy Consultants, VIC

Workshop **Years F to 6**

The proficiency strands describe the actions in which students can engage when learning and using the content of the Australian Curriculum. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can emphasise. This hands-on workshop will unpack each of the proficiency strands and how they link.

Repeated as D3

C4 Multiplicative Thinking - Using Action Research to Drive Professional Learning

Melinda Williams - Bacchus Marsh Primary School, VIC
Cathy Davidson - Bacchus Marsh Primary School, VIC
Jan Morahan - Bacchus Marsh Primary School, VIC

Workshop **Years F to 6**

At Bacchus Marsh Primary School we use action research - in particular the Helen Timperley Teacher Inquiry and Knowledge-Building Cycle - to enhance our professional learning. We will show how our teachers reflect on their practice and their impact on student outcomes. The Maths Online Interview is a starting point for evidence-informed conversations at Professional Learning Teams. We integrate student data, current teaching practice and research to drive our professional conversations. This year teachers identified multiplicative thinking as an area for professional learning across the school and we will share with you the highlights of our journey.

Not Repeated

C5 A Whole School Approach to Teaching Numeracy

Narissa Leung - Campbells Creek and Guildford Primary School, VIC
Gary Fry - Campbells Creek and Guildford Primary School, VIC
Wendy Walsh - Guildford Primary School, VIC

Lecture **Years F to 6**

In 2014 we set out to improve the numeracy teaching and learning in our small regional schools. We participated in the Bastow Leading Numeracy course together and learnt how to really dig deep and investigate and analyse current practice in order to determine areas for need across the schools. This year, we have implemented a unique whole school approach that is seeing really pleasing results. The best thing is, the work we have done in improving teaching and learning in Numeracy is now spilling across to all other areas of the curriculum.

Repeated as F9

C6 Identifying Maths in the Murky World of Free Play Construction

Cameron Lee - Green Hat Workshop, VIC
Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years F to 6**

Commercial Presentation

This workshop on play-based education will help identify learning outcomes in open ended block play. It will start by exploring connections with AusVELS and explain some of the maths that goes on in a range of block play situations and conclude with a fun/engaging open-ended, multi-ability construction activity. Tracing how blocks can be utilised from Foundation to Year 6, the talk will look briefly at Caroline Pratt inspired standard unit type kindergarten blocks and Cuisenaire Rods but focus mainly on PLANKS, blocks of the type Green Hat Workshop specialise. Identifying a range of curriculum outcomes and informal maths understandings in different types of PLANKS play. I will present my experiences in schools around Australia.

Repeated as D6

C7 enVisionMATHS Digital

Sophie Matta - Pearson Education Australia, VIC
Antje Leigh-Lancaster - Pearson Education Australia, VIC

Workshop **Years F to 6**

Commercial Presentation

This session will explore the upcoming digital enVisionMATHS resources and show how they can enhance your Primary maths classroom through the addition of new concept-based diagnostic assessment, maths engagement activities and easy-to-use data analysis. This session will focus especially on the:

- ◊ New F-6 concept-based diagnostic assessment.
- ◊ Re-developed digital maths tools.
- ◊ Enhanced Visual Learning Bridges, with hyperlinked activities supporting the development and consolidation of maths concepts.
- ◊ Innovative data analysis tool allowing you to view class progress using a variety of different measures all linked to the Australian Curriculum content descriptions and achievement standards.

Note: Bring a laptop or iPad

Not Repeated

C8 Games From a Maths Kit

Greg Butler - Camp Hill Primary School, VIC
Leanne Cummings - Camp Hill Primary School, VIC
Fiona Lindsay - Eaglehawk Primary School, VIC

Workshop **Years F to 8**

These games and activities centre around a simple maths kit of equipment made up by the class teachers. The games focus on improving instant recall of number facts and times tables, verbalization of the children's thinking and mathematical processes and improving mental calculation skills and strategies. They are fun, challenging and can be scaffolded to differentiate individual student needs.

Repeated as D8

C9 iPads as a Mathematics Learning Tool

Fiorella Soci - Caulfield Grammar, VIC
Natalie Erwin - Caulfield Grammar, VIC

Workshop **Years F to 8**

This presentation focuses on the third year of our journey of incorporating iPads into the Mathematics Curriculum. We will share what we have done and what we have learnt along the way - the good and the not so good of using iPads in the classroom. Our presentation will highlight the use of the iPad as a learning tool; moving past the idea of just focusing on the apps, to students using the iPad as a tool for learning when presented with Mathematics investigations and student led inquires.

Note: Bring your iPad along so that you can look at some of the apps. Not a requirement of the presentation but it is highly recommended.

Repeated as D9

C10 Using Growth Mindset to Improve Student Attitudes to Maths

Caroline Brown - Sacré Cœur, VIC
Georgia Papadopoulos - Sacré Cœur, VIC
Robert Tighe - Sacré Cœur, VIC

Lecture **Years F to 10**

We have been using Carol Dweck's Growth Mindset with students from Prep-12 to help students to develop perseverance and persistence in their learning. We have been teaching our students a growth mindset in maths for two years and have introduced this idea to teachers, students and parents. We will explain how we have done this, some of the activities and processes used and the benefits we have observed in students' attitudes to maths and learning.

Not Repeated

C11 Constructing and Delivering an Effective Maths Program

Jodie Parsons - Sunshine College, VIC
Yvonne Reilly - Sunshine College, VIC

Lecture **Years 1 to 12**

What are the key elements and the non-negotiables which are critical to running an effective maths program? In this option we discuss how our highly effective maths program is structured and identify the aspects which are critical to its success and how we implement these at Sunshine College to ensure the maths education we offer is fully inclusive and suitable for all students. To collect resources from this presentation please download a free QR code scanner App on to an electronic device.

Repeated as B15

C12 Using the Model Method to Assist Students to Solve Word Problems

Lei Bao - Leopold Primary School, VIC

Lecture **Years 3 to 8**

Many primary students throughout schooling have difficulties with word problems, particularly multi-step word problems. This presentation will investigate the effectiveness of the bar model method in assisting students to solve word problems involving the part-whole relationship, comparison model and multiplicative structure.

Repeated as H13

C13 Tasks and Resources for Developing Children's Multiplicative Thinking

Dr Chris Hurst - Curtin University, WA

Dr Derek Hurrell - University of Notre Dame Australia, WA

Lecture **Years 3 to 8**

The development of multiplicative thinking determines largely the extent of the mathematics that a person learns beyond middle primary school. Our current research project has so far revealed that many primary children have a procedural view of aspects of multiplicative thinking that we believe inhibits their progress. This workshop focuses on some of the teaching resources and tasks that have been developed from our research. The purpose of these tasks is to promote the development of conceptual understanding of 'the multiplicative situation' and the many connections within it and with other big ideas such as proportional reasoning and algebraic thinking.

Not Repeated

C14 Engaging Games to Develop Skills, Confidence and Higher Order Thinking

Andrew Lorimer-Derham - St Mary's Primary School, VIC

Melinda Evans - Open Universities Australia, VIC

Workshop **Years 3 to 10**

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.

Repeated as E14

C15 Classroom and Computer Games for Visual Fractions

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 10**

This workshop will focus on ways of helping students to understand common fractions with hands-on activities and related computer games. Participants will engage in group activities and receive computer games for later use.

Not Repeated

C16 Using Edmodo, A Social Networking Application, With Your Mathematics Classes

Angela Kotsiras - MathsTeachersOnly.com, VIC

Computer Workshop **Years 3 to 12**

In this workshop participants will learn:

1. How Edmodo, a free social learning network, can be used with their Maths classes.
2. How the presenter used Edmodo with her Year 8 and Year 10 students to improve learning outcomes and at the same time reduce the amount of time she had to spend assisting individual students with their maths problems.
3. How to set up an Edmodo account and invite members to join.
4. How to join a group, on Edmodo, comprising of workshop participants.

Note: Please bring your own laptop as iPads will not be suitable to set up Edmodo accounts.

Repeated as F19

C17 Technology Should Assist Teachers - Not Replace Them

Joseph Wright - The Educational Advantage, VIC
Joanna Tutos - The Educational Advantage, VIC
Danielle Henderson - The Educational Advantage, VIC

Lecture **Years 3 to 12**

Commercial Presentation

From the creators of Maths Mate: sQuizya! Your solution for classroom engagement and learning. Developed by teachers who recognize the needs of the modern classroom. sQuizya is an interactive library free of the usual copyright restrictions. Teachers can create or tailor work for their classes, share it with other teachers and even offer it for sale in the global community. A zApp is a user-friendly application offering a variety of instruction formats: exercises, tests, lessons, projects and even tutorials. Experience this powerful yet simple to use software and see how it can save you many hours of preparation and correction.

Note: If you are able to bring a web enabled device to this presentation you may find it assists your understanding of the activities offered.

Repeated as F21

C18 A Digital Toolbox for Teaching and Learning Maths

Britt Gow - Hawkesdale P-12 College, VIC

Computer Workshop **Years 4 to 9**

Contemporary classrooms have access to a huge range of resources beyond the traditional textbook, but which tools are most effective for student learning? Would you like to use free digital tools to implement an effective maths learning program at your school? In this hands-on, interactive workshop you will have the opportunity to trial tools such as Padlet, Google Forms, Create-a-Graph, Tesselations.org, Skitch and more, to use with middle-years students. Britt's resources are collected at http://digitaltoolbox.wikispaces.com and http://technomaths.edublogs.org.

Note: You may like to bring your own device - laptop or iPad - for this session.

Repeated as E18

C19 Improving Teaching with i-Screens

Douglas Williams - Mathematics Centre, VIC

Workshop **Years 4 to 10**

Picture Puzzles challenge the teaching craft you might currently be using with i-screens. Built around one screen, two learners, concrete materials and a challenge Picture Puzzles offer:

- ◊ More pictures than words.
- ◊ Multiple levels of content challenge.
- ◊ Mathematics that's concrete, visual and makes sense.
- ◊ Teaching craft that encourages mathematical conversation.
- ◊ Menus structured by content strand to support personal or whole class investigation.

This workshop is your opportunity to explore these PDF slide shows from Mathematics Centre and evaluate their learning features, You will need to bring your own web-connected computing device - smart phone, pad, tablet, netbook, laptop, it doesn't matter which. These will be used with a partner.

Not Repeated

C20 Quo Vadimus? Observations of Australian Mathematics Education from Outside the Square

Dr Michael Haese - Haese Mathematics, SA

Lecture **Years 4 to 12**

As an author of leading textbooks for Australian and International School Curricula, Michael has observed the trends in global mathematics education for many years. He sees education as a means to a more peaceful and emphatic world, and 'real-world' mathematics as essential for understanding scientific order, and equally its place at the heart of human artistic endeavour. He will discuss the vitures of both traditional and modern mathematics education in Australia, including investigation and inquiry, times tables and technology, problem solving and 'real-world' contexts, and Shakespeare. He will challenge educators to consider where we are going by looking from outside the square.

Repeated as F23

C21 Algebra as Storytelling

Giovanna Vardaro - Australian Mathematics Trust / Wesley College, VIC
Bruce Henry - Australian Mathematics Trust, VIC

Workshop **Years 5 to 8**

This presentation describes a famework for the introduction and development of algebraic thinking, which develops in students the understanding that algebra is about 'things that happen to numbers' in a narrative context. Whilst it draws on some well understood pre-algebraic pedagogies such as machine games and back-tracking, it develops these into a fuller picture of algebraic processes using the technique of 'unambiguous labelling', which relates every algebraic expression (or equation) to the story which it tells about numbers. Many examples will be given of practical activities which will allow students to use their emerging algebraic skills to explore patterns and develop algebraic thinking.

Repeated as H24

C22 Fractional Thinking in the Middle Years as a Bridge to Algebraic Reasoning

Catherine Pearn - The University of Melbourne, VIC
Dr Max Stephens - The University of Melbourne, VIC

Workshop **Years 5 to 9**

Sample solutions will show how Year 6 primary school students use "best available" symbols to move beyond arithmetic calculation and to create original chains of algebraic reasoning to solve fraction problems. Algebraic meaning is created using symbols and syntax that may be deemed by some to be mathematically incorrect. Several efficient and successful multiplicative methods are used in contrast to less efficient methods, usually additive, which may work only with simpler fraction problems. Teachers need to recognise the underlying algebraic meaning emerging from students' solutions and help all students use more efficient strategies and build their own bridges to algebra.

Repeated as G23

C23 Working With High-achieving Students

Adjunct Professor Mike Clapper - Australian Mathematics Trust, ACT

Lecture **Years 5 to 10**

This session is designed to assist teachers who have high-achieving students in their school who may have aspirations to compete in Olympiad programs or similar. In particular, we will discuss strategies for preparing students for the AIMO (Australian Intermediate Mathematical Olympiad) which is a gateway competition into the Olympiad program. Teachers will be encouraged to try some of the questions and to learn a few of the 'tricks of the trade' in advanced problem-solving.

Repeated as G25

C24 Algebraic Thinking in the Upper Primary and Lower Secondary School - Profile of a Challenging Program

Ian Bull - St Kevin's College, VIC

Lecture **Years 6 to 8**

I've aways believed that more advanced mathematical content can be taught to younger students aimed to stretch their understanding - it is a case of how it is packaged. At St Kevin's College I present Grade 6 boys with a range of experiecnces that connect algebra with geometry in a practical format, using I pad Apps and pen and paper which involve concepts beyond their years. We plot parabolas and derive Eulers rule for three dimensional solids as well as touching other content along the way. I will give out a full profile of the program including all powerpoint lessons and handouts to all participants.

Repeated as B25

C25 …and Not a Textbook in Sight

Ro Bairstow - King's College, Auckland, New Zealand

Lecture **Years 6 to 12**

In some of Ro's classes over the past three years, all students have had an iPad. He will describe how this has changed the way the classes are taught, and how the students learn, including feedback from the students. He will demonstrate some of the Apps he has found useful. He will show and make available some of the free resources he has created, including a content website for all upper primary and secondary years. Apps, games and interactive eBooks.

Repeated as B27

C26 Education Perfect Mathematics: Motivating Your Students to Excel in an Online Learning Environment

Craig Smith - Education Perfect, New Zealand

Lecture **Years 6 to 12**

Commercial Presentation

Education Perfect is proud to be working with the New Zealand Qualifications Authority to deliver NZ's first online Maths Pilot Assessments. They have also built a powerful learning resource tailored to the Australian Curriculum. With Education Perfect Mathematics, students have the opportunity to learn, revise and be assessed using an online platform that is accessible from any device with internet access. The resource provides students with a relevant range of content and can be further customised to suit teachers' and students' specific needs. With engaging Smart Lessons, spaced repetition algorithm, task-setting and advanced reporting features, as well as world-wide competitions, Education Perfect Maths is building students towards success and lifelong learning. This is a showcase session that provides an in-depth demonstration of the Education Perfect Maths program and introduces you to strategies for how to make the most of Education Perfect in your school.

Note: Bring your own laptop - fully charged, bring a pen.

Repeated as A33

C27 CAS Calculators in the Middle Years Classroom (TI-Nspire CX CAS)

Dianne Hayton - Doncaster Secondary College, VIC

Workshop **Years 7 to 9**

Mastery of CAS Calculators facilitates speedy and accurate problem solving. Students in Year 11 and 12 can focus their energy on understanding Study Guide dot points if they have already mastered CAS technology in the Middle Years Classroom. This session uses topics that appear in both the middle year's curriculum and the VCE study guide, to introduce the CAS calculator to the Middle Years student. The session will cover the logistics, lesson plans, activities and assessment for using CAS in the middle years. Participants are invited to bring their own CAS to the session and participate in activities from both the teacher and student viewpoints.

Note: Please bring your TI-Nspire CX CAS Calculator - fully charged - to this session.

Repeated as H32

C28 Improving Middle School Assessment

Tricia O'Hara - East Doncaster Secondary College, VIC

Lydia Tomic - East Doncaster Secondary College, VIC

Workshop **Years 7 to 10**

Textbook generated tests are widely used in schools, but not always effectively. Tests can be long, repetitive and may not satisfactorily assess a particular cohort. Our practical presentation and documentation aims to encourage a whole unit approach to planning and assessing middle school maths - from specifying relevant skills, pre-testing these skills, choosing/writing tasks and tests that assess the skills of your class - all mapped to AusVELS. A student reflective learning grid has been developed (and tested!) that clearly shows students what the key skills are and helps them reflect on their progress after assessment tasks.

Note: Please bring a maths test (Year 7-9) you have used at school and a flash drive for documentation from the presentation.

Repeated as G29

C29 Card Games for Junior Secondary Maths

Helen Haralambous - The Mathematical Association of Victoria, VIC

Workshop **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. MAV Commercial Presentation

Not Repeated

C30 Evaluation of Pi and Other Mathematical Constants and Functions

Leigh Thompson - Mathematics Consultant (retired teacher), VIC
Gareth Jones - Victoria University, VIC

Workshop **Years 7 to 12**

This workshop aims to provide engaging material to deepen students' understanding of some basic mathematical constants and functions. Initial investigations of problems such as squaring the circle and the sultan's dowry can enhance many students' interest and curiosity. Most mathematics students finish secondary schooling with little or no appreciation and understanding of the constants π(pi) and e, and, the functions of loge, cos, sin and tan. These are seen as 'items' to be learnt and applied. An understanding of the evaluations of these constants and functions is accessible to most senior students.

Note: Please bring a USB flash drive or similar to obtain copies of resources (including movies). Scissors, glue and a drawing compass may be useful if you can bring them.

Repeated as D34

C31 Geometric Constructions Using TI-Nspire

Mehmet Altundal - Sirius College, VIC

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.

Note: Please bring your TI-Nspire Calculator to this session.

Not Repeated

C32 Using iPads in Mathematics Teaching

Dennis Fitzgerald - Siena College, VIC

Lecture **Years 7 to 12**

How can we use iPads and similar technology in our classrooms? What apps exist for us and which of the free ones are worthwhile. This will be a discussion of my use of iPads in a Year 9 and 11 class for the first time and some suggestions on how to use them and some of the pitfalls of their introduction. Please bring your iPad if you have one and any success stories!

Note: Bring your iPad with you to share ideas.

Repeated as H36

C33 Enhancing the Teaching and Learning Mathematics With Excel

Karim Noura - Bayside P-12 College, VIC

Workshop **Years 7 to 12**

In this workshop, teachers will share the experience of using Excel in teaching and learning mathematics especially in the area of data & statistics, linear equations and graphs and also in solving problems in measurements such as find the maximum area of a rectangular paddock and the maximum volume of any rectangular box you may make of a A4 paper. However, in this workshop we will have the opportunity to solve some hard Maths problems or non-routine maths problems by using Excel.

Note: Please bring a scientific calculator to this session,and bring your own laptop - fully charged.

Repeated as E36

C34 Hang On. I've Got It!

Dietmar Schaffner - Penleigh and Essendon Grammar School, VIC

Lecture **Years 7 to 12**

This option reports on the findings of a literature review and school-based peer research project prompted by the following scenario: a student asks a teacher for help, begins to explain their difficulty but then has an epiphany and announces that they have found the solution. Can we learn what it is that enables students to solve problems simply by reading them out aloud from such diverse research topics as cognitive neuroscience, culturally-specific orality in the teaching and learning of mathematics, tip-of-the-tongue memory lapses, the effects of aphasia and deafness on mathematical thinking and the pros and cons of linguistic determinism?

Repeated as F38

C35 Using a Tablet Computer In and Out of the Maths Classroom

Peter Clerks - St Paul's Anglican Grammar, VIC
Paul Ryan - St Paul's Anglican Grammar, VIC

Workshop **Years 7 to 12**

In this session we will explore some of the ways that a tablet computer (Microsoft Surface Pro) can be used both in and out of the Mathematics classroom. A useful device, we'll look at how it can assist in writing tests, developing class notes, having students develop worked solutions to set problems, creating video clips demonstrating how to use to use the calculator amongst others.

Note: A ClassPad calculator and a charged laptop would be useful but definitely not essential.

Repeated as G37

C36 Using 3D Graphing Tools in FX Draw and FX Graph

Paul Hooper - Efofex Software, WA

Computer Workshop **Years 7 to 12**

Commercial Presentation

The new FX Draw and FX Graph can graph in three dimensions and dynamically demonstrate 3D concepts and volumes of solids of revolution. This session introduces you to the new capabilities.

Repeated as H40

C37 Maths Inside: Engaging Students in Maths by Using Real World Problems

Dr Anne Prescott - University of Technology, Sydney, NSW
Dr Mary Coupland - University of Technology, Sydney, NSW

Workshop **Years 8 to 12**

Australia has a significant problem with engaging students to continue with mathematics, especially in Years 11 and 12. This presentation will demonstrate a case study and samples of the associated materials linking real world problems provided by CSIRO, with classroom activities for Years 8-12, designed by AAMT. UTS, AAMT and CSIRO are working together with a grant from the Commonwealth Government Australian Maths and Science Partnership Program (AMSPP).

Repeated as A42

C38 Sports Betting and the Pokies

Robert Money - The Mathematical Association of Victoria, VIC
Donald Smith - VIC

Workshop **Years 9 to 10**

This session will involve activities suitable for the statistics and probability strand of the Year 9/10 curriculum. The context is gambling and the choice of activities grows out of the MAV Gambling Issues Project that was conducted in Semester 1 this year. Discover which sports betting agencies pay tax in Australia and which ones don't. The key equation is Expected long term return = probability x payout.

Repeated as D43

C39 Exploring Population Data with the TI iPad App

Jeanette Fogarty - St Mark's Anglican Community School, WA
Marc Adam - St Mark's Anglican Community School, WA

Workshop **Years 9 to 10**

This session explores indigenous and non-indigenous population data using the iPad. It also covers cross-curricular priorities with respect to Aboriginal and Torres Straight Islanders in the new Australian Curriculum. This material is suitable for working with Year 9 or Year 10 students.

Note: Bring iPads with TI iPad app.

Repeated as D44

C40 Investigating Trinomials with Integer Roots

Dr Ray Williams - St Mark's Anglican Community School, WA

Lecture **Years 9 to 11**

This session uses the TI-Nspire's ability to do algebra in a spreadsheet to investigate trinomials where the coefficient of x2 is unity. With the CAS facility, a time consuming and difficult exercise is made easy and patterns can emerge to reveal possible solutions to the question "Is there a way of finding which of these trinomials can be factorised with integers?" The results are quite interesting and lead to further areas to investigate.

Repeated as F43

C41 Enhancing the Teaching and Learning of Mathematics Through TI-Nspire CAS

Dr Wee Leng Ng - Nanyang Technological University, Singapore

Workshop **Years 9 to 12**

Handheld graphing technology, if used appropriately in the mathematics classroom, has the potential to enhance the teaching and learning of mathematics by empowering students to learn across different visual representations of mathematical concepts. With the aid of such technology, teachers have the means to help students develop a deeper understanding of abstract mathematical concepts and sharpen their critical thinking skills. In this workshop, participants will explore the use of the TI-Nspire CAS CX handheld in helping students develop relational understanding of concepts in calculus and statistics at upper secondary and pre-university levels.

Repeated as A45

C42 Numerical Solutions of Equations - A CAS Active Task

Lindy Grahn - Fintona Girls' School, VIC

Meredith Plaisted - Carey Baptist Grammar, VIC

Workshop **Years 10 to 11**

Given the introduction of the Bisection method and Newton's Method into the VCE Unit 1 and 2 Mathematical Methods CAS course, we thought that it would be appropriate to begin talking about numerical solutions in Year 10. We have developed a project that investigates both the bisection method and direct iteration to find numerical solutions. We wanted to use the CAS calculator as much as possible to reinforce some vital skills for Senior Mathematics. We have also incorporated use of the sequence application to create cobweb and staircase diagrams. Teachers can feel free to adapt the project to suit the needs of their own students.

Note: Please bring your CAS calculator and a USB.

Repeated as B41

C43 Han Solo and Feedbacca

Luke Bohni - John Monash Science School, VIC

Tristan Vale - John Monash Science School, VIC

Lisa Pizzol - John Monash Science School, VIC

Workshop **Years 10 to 12**

The JMSS Mathematics Faculty has been trialling the use of Google Scripts to provide their students with personalised, skills based feedback within the Solo Taxonomy framework. In this workshop, attendees will be introduced to the rationale and motivation behind developing this style of feedback, an introduction into what SOLO Taxonomy is and will also be given access to the Google Script used to provide the feedback to students with some instruction on how to use and modify it for their own purposes.

Note: Please bring your own laptop that is capable of connecting to the internet to this session so that you can access the example documents that we will be providing and using during the session.

Repeated as A47

C44 Further Mathematics 2016 - Problem Solving, Spreadsheets and Financial Modelling

Rob Vermay - VIC

Lecture **Years 10 to 12**

Problem Solving in the Financial Modelling Core is a compulsory school assessment in VCE Further Mathematics, 2016. A spreadsheet to model linear and geometric growth in financial loans and investments can quickly illustrate, and reinforce understanding of, recurrence relations (previously called difference equations). This lecture will explore the solution to a sample Problem Solving SAC using simple spreadsheet formulas in the step-by-step development of an amortisation table. A comparison with 'by-hand' and CAS solutions will be made.

Repeated as G43

C45 Worthwhile CAS Calculator Use in This Year's 2nd Methods Exam?

Kevin McMenamin - The Peninsula School, VIC

Workshop **Years 10 to 12**

Savvy 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.

Note: Bring along your own calculator. Some ClassPads will be avaialable for loan.

Repeated as F48

C46 ClassPad and the New 2016 VCE Further Mathematics Exam

Charlie Watson - The Tuition Centre, WA

Lecture **Years 11 to 12**

This option will focus on the use of ClassPad in teaching and assessing Units 3&4 of Further Maths using the new study design in 2016, with a glance at preparatory work from Units 1&2 of General Math. Participants will develop an awareness of key ClassPad skills that students of this course should develop and 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 let the ideas wash over you.

Note: You may choose to bring your own Casio ClassPad (old or new model) - a few available to loan on day.

Repeated as E49

C47 Empowering CAS Skills in Specialist Maths: Vectors, Circular Functions & Complex Numbers

Trang Pham - Methodist Ladies' College, VIC

Workshop **Years 11 to 12**

Have you been trying to maximise the use of CAS technology in VCE Specialist Maths? Is CAS supposedly useful in Specialist Maths? Absolutely! Particularly with multiple-choice questions. This workshop will provide all participants with hands-on opportunity to empower their CAS skills in Specialist Maths. The main focus will be on Vectors, Circular Functions and Complex Numbers. Some past exam questions will be used to illustrate how CAS can be effectively used to answer these questions, and how powerful it is that students will be full of excitement when correct techniques are applied! Please feel free to bring along any technology tips that you may have used in your class to share with the group. The session is open to TI-Nspire CX CAS and Casio ClassPad 330 users and the featured calculator will be the TI-Nspire CX CAS.

Note: Please bring along your own TI-Nspire CAS or Casio ClassPad 330 calculator and any past multiple choice exam questions to which you think can be done on a CAS calculator.

Repeated as F50

C48 Applications of Special Mathematics to Real Life Physics Problems

Yuriy Verkhatsky - Gleneagles Secondary College, VIC

Workshop **Years 11 to 12**

Mathematics is an essential tool for physics and physics is a rich source of inspiration and insight in mathematics. Physical concepts, arguments and modes of thinking are used in Mathematics. That is, Physics is, not only a domain of application of Mathematics, providing it with problems "ready-to-be-solved" mathematically by already existing mathematical tools. It also provides, ideas, methods and concepts that are crucial for the creation and development of new mathematical concepts, methods, theories, or even whole mathematical domains. And physics is already accounts for significant part of Specialist Math course like Kinematics and Mechanics. Also many students study both subjects at the same time. This presentation cover some additional examples of application of Specialist Math to Physics problems like deriving formula for RMS values (integral calculus), rocket motion (differential equations), induced emf (differentiation), calculation of electronic circuits (vectors), harmonic and damped oscillations (differential equations) and other.

Repeated as G47

C49 2014 Math Methods CAS Examinations

Allason McNamara - Mount Scopus Memorial College, VIC

Mary Papp - Caulfield Grammar School, VIC

Lecture **Years 11 to 12**

Mary and Allason will do a similar session to the 2014 MAV Meet the Examiners Lecture for Mathematical Methods CAS as well as discuss common errors from previous years.

Not Repeated

C50 Taylor Polynomials and Approximate Integration

Joel Black - Freelance Educator, QLD

Lecture **Years 12 to 12**

Taylor polynomials are presented as the topic of an application task for Specialist Mathematics. The theory of Taylor polynomials as an extension of localised linear approximation is used to generate polynomial approximations to transcendental functions, and thence to approximate definite integrals. These approximations are compared with the answers to definite integrals calculated using the usual algebraic techniques. The SAC concludes by calculating e and pi.

Repeated as G50

C51 5 Things Teachers Get Wrong During VCE Exam Revision
Andrew Worsnop - Velvet Learning, VIC
Lecture **Years 12 to 12**
Commercial Presentation
(Attended by over 200 teachers in 2014) In my VCE classes, when exam revision came around I worried that students weren't working hard enough, that they weren't allocating their time effectively and that I didn't have a lot of control when students revised different topics at the same time. In this presentation I'll show you 5 specific techniques I used in my classes to get my students exam-ready more efficiently and effectively.
Repeated as G51

SESSION C-D: 1:50pm-4:10pm Thursday 3rd December

C-D1 Getting Started with Lua and TI-Nspire
Dr Stephen Arnold - Texas Instruments, NSW
Workshop **Years 5 to 12**
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.
Note: Bring your own laptop with TI-Nspire software.
Not Repeated

C-D2 YOU SUNK MY SPACE SHIP!
Hayden McQueenie - Victoria University, VIC
Computer Workshop **Years 7 to 9**
It is well known that the game of Battleship is a fun and engaging way to introduce concepts about the Cartesian Plane. It is possible to modify the Battleship game so that it is set in space, and having each student in charge of their own "Death Star", shooting powerful lasers (straight lines) to destroy all their opponent's space ships. The player must build strategies to manipulate the equation of the line to change the gradient and y intercept to transform the line as needed. In this workshop, you will learn the modified game and be given the opportunity to play the game yourself using Geometers Sketchpad.
Not Repeated

C-D3 Using 'Algebra Tiles' to Teach Integers, Simplification, Expansion and Factorisation
Norrian Rundle - VIC
Michael O'Reilly - VIC
Workshop **Years 7 to 10**
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.
Note: Bring along a USB stick for take home resources.
Not Repeated

C-D4 Using an Online Virtual World to Teach Statistics Through Data Investigations
Dr James Baglin - RMIT Unversity, VIC
Professor Helen MacGillivray - Queensland University of Technology, QLD
Claire Hart - RMIT University, VIC
Workshop **Years 7 to 10**
Students' understanding of statistics can be greatly improved by engaging them in the entire data investigation process. However, developing contextualised and meaningful data investigations can be hampered by practical issues, ethical constraints, and the necessary know-how. The recent development of an innovative online synthetic learning environment, known as the Islands, has provided a technological solution to these challenges. The Islands simulate a realistic, human-like population that can be used for the purpose of conducting statistical and scientific investigations. This hands-on workshop will develop teachers' 'know-how' for using the Islands to teach statistics through data investigations in the Year 7 to 10 Australian Mathematics and Science Curriculum.
Note: Participants are required to bring their own portable computing device with WiFi connectivity.
Not Repeated

C-D5 Recursion in General and Further Mathematics Courses
Andrew Stewart - Presbyterian Ladies' College, VIC

Lecture **Years 11 to 12**

Recursion will now appear in "Number Patterns and Recursion" (General Maths) and in "Recursion and Financial Modelling" (Further Maths). This session will provide teaching examples, starting with basic demonstrations of recursive situations and working up to solution processes of simple and complex financial situations through recursion and the use of the Finance Solver. This presentation is based on, and extends, the material presented in the "Revised VCE Mathematics Study Implementation Support Workshops" presented in May and June this year by VCAA/MAV.

Note: Bring a graphic calculator.

Repeated as F-G6

C-D6 Using TI-Nspire CAS Technology in the Maths Methods (CAS) Classroom
Hayley Dureau - Mount Waverley Secondary College / Texas Instruments, VIC

Lecture **Years 11 to 12**

This session will focus on some commonly used TI-Nspire CAS handheld commands to assist in the areas of functions, algebra, calculus and probability taught in the Maths Methods classroom. Tips and tricks will be shown on getting the most out of the TI-Nspire, including the use of the use of dynamic Notes Pages and the CAS Navigator Software.

Note: Bring a TI-Nspire CAS handheld (or laptop with TI-Nspire CAS software) if you have one. There will be some available to borrow if you do not own one.

Not Repeated

SESSION D: 3:10pm-4:10pm Thursday 3rd December

DK1 Back to the Start: Key Numeracy Competencies in the Early Years
Dr Paul Swan - WA

Keynote **Years F to 2**

If we wish to secure the future (of mathematics education and society) then we need to get our young children off to a good start. This keynote will share the research on early years number and will offer a learning trajectory for educators to consider. Hands-on activities and games will be used to illustrate key ideas in the trajectory.

Dr Paul Swan is a co-author and author of many books including Teaching Primary Mathematics 5th Edition (Booker, Bond, Sparrow and Swan). He is an honorary life member of the Mathematical Association of Western Australia and was recently awarded an honorary fellowship of the Australia College of Education for his work with Primary School Principals.

DK2 Engineering and Mathematics: An Ocean of Opportunity
Dr Roberto Ojeda - University of Tasmania, Australian Maritime College, TAS

Keynote **Years 9 to 12**

With a major reduction in the number of students studying pre-tertiary mathematics, we attempt to motivate and inspire students to continue with their mathematics studies by exposing them to real-life applications of Mathematics. We apply maths being learned in Years 10, 11 and 12 to real-life engineering applications, with examples of integral calculus, differential equations, trigonometry and data analysis.

Dr Roberto Ojeda is the Course Coordinator for the BEng in Naval Architecture program at the Australian Maritime College, an institute of the University of Tasmania. He is actively involved in the teaching of 1st and 2nd year engineering units at AMC for which he has been awarded two teaching merit certificates. Dr Ojeda has also been actively engaged in ALTC and OLTC funded projects aimed at developing on-line Adaptive Tutorials to teach key threshold concepts to first year engineering students.

D3 Unpacking the Proficiency Strands

Kathryn Palmer - Every Child Counts Numeracy Consultants, VIC

Workshop **Years F to 6**

The proficiency strands describe the actions in which students can engage when learning and using the content of the Australian Curriculum. While not all proficiency strands apply to every content description, they indicate the breadth of mathematical actions that teachers can emphasise. This hands-on workshop will unpack each of the proficiency strands and how they link.

Repeated as C3

D4 Doing Maths is Awesome - iPads, Animation and Assessment

Stephen Cadusch - Pyalong Primary School, VIC

Lecture **Years F to 6**

Details the experience of using animation as an assessment tool in the Primary Mathematics classroom. iPads make creating animation a relatively easy task, achievable by even the youngest students. Asking students to prepare an animation that displays their understanding of Maths concepts provides a visualisation of their thinking. This can be highly revealing of a students' thought processes and depth of understanding enabling assessment and identification of misconceptions, especially when students work independently. Student animation examples and suitable apps will be demonstrated.

Repeated as H2

D5 "It's About Managing Information" - Teaching Data and Statistics in Primary School

Jacinta Blencowe - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years F to 6**

Teaching data and statistics in primary school often results in students making "pretty" graphs. But what's the maths in this?? This workshop involves looking at the proficiencies - Fluency, Understanding, Reasoning and Problem Solving in relation to the teaching of data and statistics in F-6 classes. Investigating the different types of data, relating data collection to real life situations, ideas for extension activities and some practical resources are explored in this workshop.

Repeated as H3

D6 Identifying Maths in the Murky World of Free Play Construction

Cameron Lee - Green Hat Workshop, VIC

Workshop **Years F to 6**

Commercial Presentation

This workshop on play-based education will help identify learning outcomes in open ended block play. It will start by exploring connections with AusVELS and explain some of the maths that goes on in a range of block play situations and conclude with a fun/engaging open-ended, multi-ability construction activity. Tracing how blocks can be utilised from Foundation to Year 6, the talk will look briefly at Caroline Pratt inspired standard unit type kindergarten blocks and Cuisenaire Rods but focus mainly on PLANKS, blocks of the type Green Hat Workshop specialise. Identifying a range of curriculum outcomes and informal maths understandings in different types of PLANKS play. I will present my experiences in schools around Australia.

Repeated as C6

D7 Designing for Deep Learning Using the SOLO Taxonomy

Jen Briggs - Derrimut Primary School, VIC

Workshop **Years F to 6**

This workshop will guide participants through developing learning experiences that foster deep learning using the SOLO taxonomy. Resources will be available to source a combination of rich tasks and content based learning experiences that can be used to create a learning sequence that progresses students from isolated skills in mathematics to deep relational thinking. Links will be made around collecting formative assessment to inform future teaching. Examples of primary school units created and used by Derrimut Primary School will be available for participants.

Note: Please bring a device for planning purposes. Internet access would be beneficial.

Repeated as F10

D8 Games From a Maths Kit

Greg Butler - Camp Hill Primary School, VIC
Leanne Cummings - Camp Hill Primary School, VIC
Fiona Lindsay - Eaglehawk Primary School, VIC

Workshop **Years F to 8**

These games and activities centre around a simple maths kit of equipment made up by the class teachers. The games focus on improving instant recall of number facts and times tables, verbalization of the children's thinking and mathematical processes and improving mental calculation skills and strategies. They are fun, challenging and can be scaffolded to differentiate individual student needs.

Repeated as C8

D9 iPads as a Mathematics Learning Tool

Fiorella Soci - Caulfield Grammar, VIC
Natalie Erwin - Caulfield Grammar, VIC

Workshop **Years F to 8**

This presentation focuses on the third year of our journey of incorporating iPads into the Mathematics Curriculum. We will share what we have done and what we have learnt along the way - the good and the not so good of using iPads in the classroom. Our presentation will highlight the use of the iPad as a learning tool; moving past the idea of just focusing on the apps, to students using the iPad as a tool for learning when presented with Mathematics investigations and student led inquires.

Note: Bring your iPad along so that you can look at some of the apps. Not a requirement of the presentation but it is highly recommended.

Repeated as C9

D10 Problem Based Learning and Incorporating Sugata Mitra's Research in Mathematics Teaching

Julie Andrews - Parkwood Green Primary School, VIC

Lecture **Years F to 9**

On a recent study trip to New York, I asked myself the question, "do I have high expectations of my students?" After more than 10 years specialising as a consultant in mathematics, I was confident that I had established well researched methods for teaching mathematics that consistently resulted in improved student learning outcomes. When, I set myself an impossible task, however, inspired by the work of Sugata Mitra, the results permanently changed the way I teach mathematics. This workshop will explore the concept of problem based learning, based on the 5 Practices for Orchestrating Mathematics Discussions (Smith and Stein), and why a contructivist approach to teaching mathematics is essential.

Repeated as H5

D11 Essential Maths for the Australian Curriculum, Cambridge Senior Maths and Cambridge HOTmaths - A Guide to Cambridge's Online Resources Powered by HOTmaths

VJ Gunawardana - Cambridge University Press, VIC

Computer Workshop **Years F to 10**

Commercial Presentation

HOTmaths is Australia's premier online resource to teach and learn mathematics. This year Cambridge has loaded the new editions of the Essential Mathematics for the Australian curriculum series (7-10) and the new Cambridge Senior Maths for Australian Curriculum/VCE series (11-12) onto the HOTmaths platform. This workshop will highlight how these new titles have been integrated with HOTmaths and demonstrate how to navigate through all 3 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.

Repeated as E39

D12 Entrepreneurship: Linking Maths to the Real-World

Tonia Ford - Cashtivity, VIC

Lecture **Years F to 12**

Educator's worldwide are beginning to realise the value and potential that entrepreneurial educaiton offers students. For teachers, the opportunity to weave content-specific knowledge and skills in to real-life situations is crucial to maintain student engagement and foster deep learning. Entrepreneurship affords stron links to mathematics by introducing accounting, economics, commerce and marketing opportunities that naturally arise through building a business. These include planning, conducting and analysing market research; managing expenses and profits; forecasting sales; and calculating tax, interests and discounts. Cashtivity is an online learning platform that support students through the business building process, in a collaborative and project based context.

Not Repeated

D13 Check the Clues: Solving Word Problems

David Dunstan - AISWA, WA

Workshop **Years 1 to 6**

The Problem Solving and Reasoning proficiencies are key aspects of the mathematics curriculum. This session will highligh the role that mathematical language and reasoning play in solving word problems. The problems are linked to the Australian Curriculum to assist teacher planning. Co-operative group learning principles will be applied in this hands-on session. Participants will leave with a wealth of ideas.

Not Repeated

D14 Problem Solving Together - Using Assessment to Unlock Student Potential

Cassandra Lowry - Lumen Christi Catholic Primary School, VIC

Marguerite McGrath - Lumen Christi Catholic Primary School, VIC

Workshop **Years 2 to 6**

This hands-on workshop aims to provide teachers with practical examples of how teacher and peer assessment can be used to support the development of students' mathematical knowledge and understanding. Building on the problem solving process, adapted from the work of George Polya, this workshop will demonstrate how teachers can engage students in mathematics lessons by giving them greater opportunities to take a key role in assessment practices. This ongoing assessment gathering allows for immediate feedback and helps the teacher to provide more targeted differentiation of the curriculum.

Repeated as A16

D15 Kids & Cup Cakes & Poster Puzzles

Douglas Williams - Mathematics Centre, VIC

Workshop **Years 2 to 10**

Based on Task 212, Monkeys & Bananas, this workshop changes the story shell to make it easy to use your Poly Plug or other simple material such as bottle caps to explore the challenge. It is presented as a Poster Problem to introduce, or refresh, this technique of absorbing learners in a problem by developing their ability to read and understand it. The task can be tackled with little content background, but it also 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.

Not Repeated

D16 Di-vision of Fun in the Inclusive Maths Classroom: Equal Sharing of Success

Sabine Partington - Carey Baptist Grammar School, VIC

Dr Wendy Taylor - Bentleigh Secondary College, VIC

Workshop **Years 2 to 12**

In this session, we will model inclusive teaching practices that will engage and appropriately challenge all students. Activities will include hands-on puzzles, open-ended tasks, differentiated worksheets and games. The activities are specifically chosen to be adaptable for a range of topics and age groups. Resources will be shared electronically via a website.

Not Repeated

D17 Visualisation and Geometry Based on Vines

Trevor Faure - Stevensville Primary School, VIC

Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 6**

Jennifer and Trevor will explore the ways Visualisation and Geometry are important to teach and how it can be used to improve teaching and learning. Using hands-on activities based on Vines activities. You will be given some concepts and ideas to assist you on how to implement these strategies within your classroom.

Repeated as F18

D18 Interactive Mathematics Tests for NAPLAN. Years 3, 5, 7, 9

Bill Healy - Kilbaha Multimedia Publishing, VIC

Lecture **Years 3 to 9**

Commercial Presentation

NAPLAN goes online in 2017. Have you had experience giving interactive Mathematics Tests to your students? Come along and see what it is like. In this presentation, you will be able to do a NAPLAN Maths Test interactively on your laptop. The Test will be automatically marked for you. (Don't worry - only you will know the result!) You then get to keep the test for FREE use with your students. We will then discuss the issues of the Australian Mathematics Curriculum and branched testing for NAPLAN 2016 and 2017.

Note: Bring your own laptop - fully charged.

Repeated as H15

D19 Classroom and Computer Games for Visual Calculations

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 10**

This workshop will focus on ways of helping students to understand multiplying and dividing whole numbers and decimals with hands-on activities and related computer games. Participants will engage in group activities and receive computer games for later use.

Not Repeated

D20 Enrichment in the Upper Primary School

Bruce Henry - Australian Mathematics Trust, VIC

Giovanna Vardaro - Australian Mathematics Trust / Wesley College, VIC

Workshop **Years 4 to 6**

This workshop is concerned with teaching teachers of upper primary students some of the matheamtics that is particularly suitable for enrichment, either of individuals or small groups or whole classes. Participants will be encouraged to share experiences. Topics which may be covered are squares, cubes, Fibonacci numbers, prime numbers, counting techniques, clock arithmetic and problem solving.

Repeated as E17

D21 Hammer or Nail Gun? Add or Multiply. Choosing the Right Tool

Christine Lenghaus - VIC

Workshop **Years 4 to 9**

Are you frustrated with children not knowing basic times tables and then seeing what a struggle maths is for them when they don't? Me too! This is a solution I developed in my classroom which gives them confidence with numbers and able to experience success in maths. Enjoy an alternative to the traditional teaching of maths which engages the whole brain in a visual and tactile way, making learning concepts such as multiplication easy and how this then links in to decimals and algebra.

Note: Bring a long a USB for any documents that will be available.

Repeated as H20

D22 Using Scratch and Minecraft in Middle Years Maths Classes

Britt Gow - Hawkesdale P-12 College, VIC

Computer Workshop **Years 4 to 9**

Have you ever wondered how you can incorporate basic computer coding or open-ended gaming environments in your maths classes? Britt has achieved successful student outcomes using Scratch as a platform for learning 'drag and drop' coding while consolidating understanding about Cartesian co-ordinates and transformations. Students immersed in the Minecraft virtual environment learned about surface area and volume. This hands-on, interactive workshop will demonstrate student learning tasks and give you the opportunity to trial Scratch. Britt's resources are collected at http://digitaltoolbox.wikispaces.com and http://technomaths.edublogs.org.

Note: You may like to bring your own device - laptop or iPad - for this session.

Repeated as G19

D23 The Teacher's Survival Guide to Using Wolfram|Alpha in the Classroom

Craig Bauling - Wolfram Research, USA

Lecture **Years 4 to 12**

Commercial Presentation

Wolfram|Alpha and Wolfram|Alpha Pro have become defacto products that your students are using daily in their Maths, Physical and Social Science classes. Likely, it is on most of the smart phones your students are using. Being prepared to address the challenges this creates and to use this technology as a supporting tool in your teaching is critical. This session will lead you through a deep understanding of the capabilities of the Wolfram|Alpha products and how to successfully use them to advance the learning of your students. No prior knowledge of Wolfram|Alpha nor Wolfram|Alpha Pro is needed.

Repeated as H23

D24 Sundials and Other Solar Instruments

Tim Byrne - VIC

Workshop **Years 5 to 8**

Astronomy is at its best when it's hands-on, just like mathematics. This workshop enables participants to investigate some daytime astronomy safely and mathematically. The workshop is an open ended investigation into telling the time and its relationship to the celestial sphere. Beginning with solar observations using a mirror, which lead to tracking the sun's apparent movement and finishing with a sundial. Participants are introduced to the Earth's rotational axis, latitude, longitude, time zones and orbital ellipses. Participants can become familiar with estimating and measuring altitude angles of the sun and moon with another home-made instrument first used by Ptolemy.

Not Repeated

D25 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.

Note: Please bring a laptop.

Repeated as E24

D26 Developing Proportional Reasoning

Lorraine Day - University of Notre Dame, WA

Dr Derek Hurrell - University of Notre Dame, WA

Workshop **Years 5 to 9**

This interactive workshop will investigate a range of activities to assist in the development of proportional reasoning. Proportional reasoning is one of the big mathematical ideas students will encounter. It applies to a wide range of contexts across all of the content strands and is considered a critical concept for success in secondary mathematics. It requires an ability to think multiplicatively and relationally, and is often problematic for students.

Not Repeated

D27 Statistics for Changing World: The Google Public Data Explorer - In Mathematics Classroom

Iqbal Hossain - The Grange P-12 College, VIC

Rudy Birsa - Williamstown High School, VIC

Computer Workshop **Years 5 to 10**

In today's classroom there is often the need to find reliable data on a variety of subjects. Often the plethora of data available can be overwhelming. To assist in prioritizing the type of datasets to be used, the session will introduce a new tool called, 'The Google Public data Explorer'. This tool facilitates the exploration of large datasets through visualisation. Navigation of the dataset is rendered straight forward, thereby allowing very effective communication of any findings. Students and teachers can create sophisticated visualisations of public data and embed them in their own projects and work.

Repeated as G24

D28 Convergent & Divergent Thinking

Adjunct Professor Mike Clapper - Australian Mathematics Trust, ACT

Lecture **Years 5 to 10**

This presentation is designed to assist teachers in developing enrichment programs in their school that incorporate elements of both convergent and divergent thinking in order to assist students in developing mathematical creativity. It will include exploring a very large number of activities which have been successful in the classroom.

Repeated as H27

D29 Made By Maths: An MAV App

Ellen Corovic - The Mathematical Association of Victoria, VIC

Workshop **Years 5 to 10**

The MAV's Made By Maths interactive app houses a series of mathematical walks (or trails). The current walks include; Swanston Street CBD, LaTrobe Bundorra and a school based trail. This session will demonstrate how to use the Made By Maths app and provide additional teaching tips and ideas for use in the classroom. Teachers will gain experience in using the App for themselves. Additional teacher tools have been built into the construction of the app and these will also be explored. A key feature of the Made By Maths app is that teachers can retrieve student work completed in-app through the MAV website. MAV Commercial Presentation

Note: To make the most out of these session, participants are requested to bring a smartphone or tablet to this workshop and download the app and walk to their device prior to the workshop. Made By Maths is available at the iTunes and Google stores.

Not Repeated

D30 Retaining Maths: How to Stop Your Students From Forgetting What They Learn

Michaela Epstein - Hume Central Secondary College, VIC
Andrew Worsnop - Velvet Learning, VIC

Lecture **Years 5 to 12**

It can be incredibly frustrating to find yourself reteaching old material to students. So often it seems our students have forgotten much of what we know has been taught in the past year or even six months. This is not inevitable. It's actually easily preventable. Andrew and Michaela will present simple techniques that will allow you to spend less time revising, push students further and see hard work turn into long-term results.

Repeated as H29

D31 Boosting the Performance of High Achieving Students in Examinations Through Error Analysis

Jane Irvin - Morayfield State High School, QLD

Workshop **Years 7 to 9**

Teaching a class of high achieving Year 8 students it became apparent that work needed to be done regarding their solutions to problem solving questions in examinations. Students were making errors that indicated that they had not 'picked up' on words in the question that impacted on the way the question needed to be answered. The concern was that this could adversely affect their result on an answer-based assessment such as NAPLAN. This workshop will share a strategy that used error analysis to teach students to analyse the questions and to analyse their own solutions to problems.

Repeated as F32

D32 Linear Equations and Correlations - An Authentic Introduction to Algebra

Nathan Peterson - Scotch Oakburn College, TAS
Emily Peterson - Queechy High School, TAS

Workshop **Years 7 to 10**

Have you ever wondered how to introduce algebra in a way that allows students to engage with and understand what is happening? Perhaps the most ideal, and unlikely, way to introduce algebra is via the linear equations formed from students' own data. In this workshop, you will learn how to use student data to introduce algebra and how to display this data using ICT.

Note: Please bring your own laptop - fully charged.

Not Repeated

D33 The Next Big Thing - Collaborative Online Courses

Shirly Griffith - Jacaranda, VIC
Pauline Holland - Jacaranda, VIC

Workshop **Years 7 to 10**

Commercial Presentation

Introducing Jacaranda learnON Mathematics - a collaborative, customisable, media-rich online course designed to improve learning outcomes. Students access, complete, and submit work online; collaborate with their peers and teacher at the point of learning and receive immediate and meaningful feedback. No more separate textbooks, workbooks and folders! All course materials and student work is integrated in one place. Teachers assign tasks and have greater visibility as to how their students are tracking via online reports. Workshop participants will receive codes to discover this groundbreaking resource, which harnesses the power of digital learning in ways never before thought possible.

Note: Bring personal laptop or tablet.

Not Repeated

D34 Evaluation of Pi and Other Mathematical Constants and Functions

Leigh Thompson - Mathematics Consultant (retired teacher), VIC
Gareth Jones - Victoria University, VIC

Workshop **Years 7 to 12**

This workshop aims to provide engaging material to deepen students' understanding of some basic mathematical constants and functions. Initial investigations of problems such as squaring the circle and the sultan's dowry can enhance many students' interest and curiosity. Most mathematics students finish secondary schooling with little or no appreciation and understanding of the constants π(pi) and e, and, the functions of loge, cos, sin and tan. These are seen as "items" to be learnt and applied. An understanding of the evaluations of these constants and functions is accessible to most senior students.

Note: Please bring a USB flash drive or similar to obtain copies of resources (including movies). Scissors, glue and a drawing compass may be useful if you can bring them.

Repeated as C30

D35 Non-Intuitive Mathematics

Ken Ellis - In-School Tutor Service, VIC
Rick Swan - Numeracy and Data Solutions, VIC

Lecture **Years 7 to 12**

Remember that element of delight when you are surprised by what the answer is, to what appeared to be a straightforward situation? That's delight is what we aim to give you when you try out our collection of investigations. The activities will range from numeric to geometric to physical modelling, and will be accessible to a variety of levels and expandable to stretch even the most mathematically talented.

Note: Calculator/iPad may be useful.

Repeated as B35

D36 Demonstrating Desmos and Other iPad Apps for 7-12 Maths

Bryn Humberstone - Caulfield Grammar School, VIC
Chris McCarty - Caulfield Grammar School, VIC

Lecture **Years 7 to 12**

Desmos has proved to be a revolutionary addition to a Maths teacher's toolbox when demonstrating concepts graphically or having students interactively explore concepts. It is freely available on iPads, laptops and other phones/tablets. In this presentation we will show the power and versatility of Desmos and some other apps we use to help students understand concepts from Year 7 to 12. Together with our colleagues we have produced a range of standalone activities for students at different year levels to be integrated seamlessly into our Teaching/Learning program. We will showcase a sample of these in our presentation.

Note: You might like to install Desmos beforehand on a phone/tablet if you have not already, but this is not required.

Not Repeated

D37 Mathematica: Learn Some Coding

Ian Willson - VIC

Workshop **Years 7 to 12**

Mitch Resnick, Lifelong Kindergarten Group, MIT Media Lab: "young people today have lots of experience and lots of familiarity with interacting with new technologies, but a lot less so of creating and expressing themselves. with them. It's almost as if they can read but not write." Conrad Wolfram, the world's most recognised advocate of computer-based maths: "the modern way to teach mathematics is to help students learn how to code, it's like composition in English - a way to teach understanding." In this workshop you will learn and use Mathematica code to do a range of mathematical activities in statistics, graphics and graphs of functions. For use with both current curriculum content and what might constitute Computer-Based Maths. Beginners and experienced users.

Note: Use Mathematica software on either your own laptop or on workstations in the computer lab venue.

Repeated as G35

D38 iLearn:weLearn: Senior Maths to Maths for Intellectual Difficulties: A Productive School Partnership

Brett Fitzsimmons - Brighton Grammar School, VIC

Lecture **Years 7 to 12**

High performing Year 9/10 mathematics students volunteered to link with Year 8/9 intellectually disabled students at a special school, and developed iPad apps to support mathematical understanding for survival in the real world. The results were unexpected and related not just to mathematics learning, but to team building, partnership development and a model for flexible, exciting middle secondary years curriculum.

Not Repeated

D39 Managing Change: From Here to There, via Where?

Samantha Horrocks - Werribee Secondary College, VIC

Lecture **Years 7 to 12**

Who, what, when, where, why, and how do we teach? What do we want in a secondary maths department? How can we juggle changes in curriculum, assessment, research, cohorts, timing and staff? Planning for change is an opportunity. This session will give an insight into one subject leader's approach to managing long term change and making plans for the future. I will ask you to consider your own motivations, vision, drivers, role models, theoretical standpoints and how these affect your department's future goals. This session is aimed at subject leaders and those interested in having this role in the future.

Repeated as G36

D40 Lessons From CAS. What Can We Learn? What Can Our Students Learn?

Martin Buchholtz - Rowville Secondary College, VIC
Peter Fox - Texas Instruments, VIC

Workshop **Years 7 to 12**

We're going on a question hunt. We're gonna find some good ones. We're not scared! Whether you've 'barely' scratched the surface or you're an experienced user of CAS, this workshop, just like the 'bear hunt book' will go in, over, under and through a collection of interesting and challenging questions applicable to students in Years 7 through to Year 12. Can CAS change what and how we teach mathematics? What can we learn? What can our students learn? Be prepared for challenges, be prepared to think and most of all, be prepared to question!

Repeated as F39

D41 STEM: Women Are All Over It (The Shirt)

Dr Katherine Seaton - La Trobe University, VIC

Lecture **Years 7 to 12**

In January this year, a crowd-funding project in the US financed the production of what was originally called "that other shirt". It features the faces of 50 women who have made significant contributions to mathematics and other sciences across continents and centuries. Come and meet some of these women. (The presenter has no commercial connection to this inspiring project. She just loves her shirt.)

Not Repeated

D42 More Passionless Moments

Bruce Ruthven - Melbourne Grammar, VIC

Workshop **Years 8 to 12**

Feeling jaded after another tough year - then this is the session for you. This workshop will explore more of the problems used in the Passionless Moments series in Vinculum. They are designed to break up to tedium of some lessons so that students get a chance to work on their problem solving skills with problems that often have solutions that seem counterintuitive to any form of reality. You may see an opportunity to use the problems in another way, perhaps for long term problem solving or extension for more able students, but either way you will leave with a set or handouts ready for use the next day! The problems are suitable for a variety of abilities from Year 8 to Year 12 and are guaranteed to generate some level of interest.

Repeated as H41

D43 Sports Betting and the Pokies

Robert Money - The Mathematical Association of Victoria, VIC
Donald Smith - VIC

Workshop **Years 9 to 10**

This session will involve activities suitable for the statistics and probability strand of the Year 9/10 curriculum. The context is gambling and the choice of activities grows out of the MAV Gambling Issues Project that was conducted in Semester 1 this year. Discover which sports betting agencies pay tax in Australia and which ones don't. The key equation is Expected long term return = probability x payout.

Repeated as C38

D44 Exploring Population Data with the TI iPad App

Jeanette Fogarty - St Mark's Anglican Community School, WA
Marc Adam - St. Mark's Anglican Community School, WA

Workshop **Years 9 to 10**

This session explores indigenous and non-indigenous population data using the iPad. It also covers cross-curricular priorities with respect to Aboriginal and Torres Straight Islanders in the new Australian Curriculum. This material is suitable for working with Year 9 or Year 10 students.

Note: Bring iPads with TI iPad app.

Repeated as C39

D45 Mathematica for Mathematical Methods Units 1 and 2

Rohan Barry - Wodonga Secondary College, VIC
Dr David Leigh-Lancaster - VCAA, VIC

Computer Workshop **Years 9 to 12**

Wodonga Secondary College is one of the schools involved in the implementation of Mathematical Methods (CAS) computer-based examination and currently has students using Mathematica as enabling technology in Year 11, having commenced in Year 10 in 2014. This workshop will look at how Mathematica has been used for teaching, learning and assessment at the school in 2015, through a collection of notebooks (interactive Mathematica files) developed for this purpose. There will also be discussion of the experiences of the teachers involved, and practical considerations related to implementation. Prior familiarity with Mathematica is not assumed.

Note: Participants should bring along a USB to copy any notebooks they wish to use.

Repeated as F47

D46 Triangles, Cevians and Areas

Raymond Rozen - RMIT, VIC

Workshop **Years 10 to 12**

In this hands-on session the geometry features of TI-Nspire will be explored by drawing cevians in triangles and calculating the ratios of the resulting intersecting areas. A cevian is a general term for a line segment from one vertex of a triangle to the opposite side. The task will develop from particular cases to a general situation where we can model and verify the results of some geometrical theorems. So bring along your TI-Nspire handheld, laptop or Ipad and gain experience in using many facets of the geometry application in TI-Nspire.

Not Repeated

D47 An Introduction to 3D Graphing on the TI-Nspire

Brian Lannen - Victory Lutheran College, VIC
Greg Barras - Victory Lutheran College, VIC

Workshop **Years 10 to 12**

It's quite easy to set a Graph or Geometry page on the TI-Nspire to a 3D view, but doing something useful with it takes a bit more thinking (and computer) power. This workshop aims to introduce you to the basic commands that are used to navigate your way about in a 3D Graphing view. Files of some standard 3D solids (cone, cylinder, sphere, prisms) will be developed and/or shared so that you will have this to show and discuss with your students. Taking it to the next level, we will then examine how parametric equations are used to explore solids of revolution with consideration of the calculus that relates to this.

Not Repeated

D48 Using MATLAB in Secondary School Mathematics

Dr Ian Thomson - Ormiston College, QLD

Workshop **Years 10 to 12**

MATLAB is interactive software used by millions of engineers and scientists across the world. It is a powerful tool which aids the visualisation of concepts and encourages experimentation. MATLAB is the technical software that is predominantly used in STEM-related courses through the country. It is now very accessible to schools and extensive support is readily available. Gaining experience with MATLAB whilst still at school gives students an advantage and forges a helpful link in their transition from secondary to tertiary studies. In this workshop participants examples and demonstrations will be provided that will show that MATLAB is very suitable for use in secondary school mathematics investigations and assessment.

Not Repeated

D49 ClassPad Activities: Using Technology to Support Mathematics Learning

Andrew Pateman - Wesley College, WA
Ian Sheppard - Wesley College, WA

Workshop **Years 10 to 12**

Commercial Presentation

In WA, Computer Algebra Systems (CAS) have become a part of senior school students' mathematics toolkit in recent years. The authors of the ClassPad activities series, a largely new resource, have attempted to produce materials that encourage student understanding of course content through the use of technology and CAS in particular. The materials support the Australian Curriculum courses, General, Methods and Specialist. In this session participants will gain an appreciation of the authors' classroom practice and philosophy, including workshopping an activity using the Casio ClassPad.

Note: Please bring Casio ClassPad or emulator.

Repeated as H46

D50 Implementing the New VCE Foundation Mathematics Study Design

Claire Delaney - Lalor Secondary College, VIC

Andros Constantinou - Lalor Secondary College, VIC

Workshop **Years 11 to VCAL**

It is nearly time to implement the new VCE Foundation Mathematic Study Design. Are you ready? Find out about some of the changes to the Study Design, including ideas on how to implement the changes. Some successful activities and assessment tasks will be presented, especially for themed units; and participants will be encouraged to share their ideas and activities in this practical workshop atmosphere. The use of technology in VCE Foundation Mathematics and essential skills for students progressing to tertiary (or further) education will also be discussed.

Repeated as F51

D51 Algorithmics (HESS) via Distance Education

Neale Woods - Distance Education Centre Victoria, VIC

Georgia Gouros - Distance Education Centre Victoria, VIC

Workshop **Years 11 to 12**

The Distance Education Centre Victoria (DECV) offered the new Algorithmics (HESS) Study Design during 2015. Algorithmics (HESS) is a challenging subject and doing it via distance education offers additional challenges. In this workshop, participants will have the opportunity to hear from the two teachers who taught Algorithmics (HESS) at DECV in its inaugural year. The teachers will explain the basic structure of the course and the experiences they had in developing the material. This workshop will be particularly relevant for teachers who are considering offering Algorithmics (HESS) in the future but who are looking for an educational alternative in the interim.

Note: Participants are encouraged to bring a laptop or tablet to access the online Algorithmics material that will be presented during the session.

Repeated as H49

SESSION E: 9:00am-10:00am Friday 4th December

EK1 More Than Mathematics: Developing Effective Problem Solvers

Dr Amie Albrecht - University of South Australia, SA

Keynote **Years F to 12**

Complex, loosely-defined problems encountered in both the workplace and everyday life demand more than technical proficiency in mathematics. They also require broader capabilities including formulating problems, devising and implementing solution approaches, creativity, teamwork, project management, and communication skills. Significantly, these skills are often needed for any challenging mathematical problem - independent of whether it originates in the 'real world' or not. So, how do we prepare our students with these skills in a mathematical setting? How can we develop and broaden their abilities and confidence in posing and solving mathematical problems? To address these questions, I'll draw on my experiences as an industrial mathematician, training workplace-ready students, and teaching a new course designed to build mathematical thinking and problem-solving skills in pre-service teachers through games and puzzles.

Dr Amie Albrecht is a mathematician at the University of South Australia. Amie works in the field of Operations Research - the science of making smarter decisions. Her research mainly focuses on finding solutions for more efficient and sustainable transport. Amie is keen on sparking and nurturing an appreciation of mathematics in students, teachers and the broader community - in her classes, via partnerships with teachers, and through enrichment programs and other events. She has served on the Executive Committee of the Mathematical Association of South Australia (MASA) and the national mathematics education committees of the Australian Mathematical Society (AustMS) and the Australian Mathematical Sciences Institute (AMSI).

EK2 Statistics Teaching: Looking Back and Forward Fifty Years

Professor Terry Speed - Walter & Eliza Hall Institute, VIC

Keynote **Years 9 to 12**

The theme of this conference "Back to the Future". I can certainly speak with authority on the "Back" part, and no one of us knows much more than the rest about the "Future". I will try to extrapolate 50 years from my 50 years of past experience, and see where that leads me. One theme that I have seen recur over the years is the addition of new areas to, and the loss of old areas from statistics. In other words, Change. That we must anticipate Change is no surprise. The challenges are two-fold: how quickly and what should we change, that is, when should we act, and what new things should we embrace, what old things should we hold on to. I'll talk about this, knowing full well that I will not be around to see how my predictions turn out.

Terry Speed completed a BSc (Hons) in mathematics and statistics in 1964 at the University of Melbourne, and a PhD in mathematics at Monash University. He has held appointments teaching statistics at universities in Australia, the UK and the USA, and he has worked for the CSIRO. In 1997 he took up his present appointment with the Walter & Eliza Hall Institute of Medical Research. Over the last 50 years, he has applied statistics to many areas of science and technology, and to business, industry and government. His current interests lie in the application of statistics to genetics and genomics, and to related fields such as proteomics, metabolomics and epigenomics.

E3 Making Maths300 Work for You

Douglas 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.

Not Repeated

E4 Engaging Preppies

Michelle Lopaticki - Stevensville Primary School, VIC

Workshop **Years F to 1**

This workshop will focus on how to engage Foundation students through directed play based Mathematics in the first term of schooling. There will be hands-on components to the workshop that allow delegates to have the opportunity to experience practical activities that can be used in Early Years classroom programs. Ivanka and Michelle will share their journey through their participation in a network based professional learning in 2014 and how the learning they gained and the data available from the numeracy online has informed the activities chosen for their Foundation classroom programs.

Repeated as A3

E5 Maths Beyond the Four Walls

Helen Baldock - Baden Powell College P-9, VIC
Rachael Scales - Baden Powell College P-9, VIC
Beth Galea - Baden Powell College P-9, VIC

Lecture **Years F to 4**

Moving beyond the 4 Walls is an exciting school community engagement project that is aimed at connecting all parents, with current learning and strategies used in numeracy today. It is about developing parent capacities in understanding how and why the strategies viewed are used in the classroom. The project has potential for students to be prepared for and to be challenged at a deeper level through questioning and applying their skills in classroom activities. Moving beyond the 4 Walls takes the advantage of using powerful web 2.0 tools to bridge the gap between school and home, creating an enriched partnership.

Repeated as F7

E6 A Flexible Approach to Number

Peggy Ashton - Latrobe Uni, VIC
Jennifer Vincent - VIC

Workshop **Years F to 5**

Have you ever thought about teaching number in a different way, such as tapping into children's natural way of working with numbers? In this workshop we will explore a range of mental computation approaches for developing versatile thinking in students, and how these understandings can be applied to computation strategies.

Repeated as F8

E7 An Introduction Into Maths Talent Quest

Andrew Noordhoff - Jells Park Primary School, VIC
Lauren Newton - Jells Park Primary School, VIC

Workshop **Years F to 6**

Andrew and Lauren will present a summary of what Maths Talent Quest is, how to formulate ideas for a project and have previous years projects on display for people to look through.

Not Repeated

E8 Planning for All 4 Maths Proficiencies

Lisia Halton - Roxburgh Rise Primary School, VIC
Melissa Brown - Roxburgh Rise Primary School, VIC
Hayley Osborne - Roxburgh Rise Primary School, VIC

Workshop **Years F to 6**

During this workshop we will explore the 4 Maths Proficiencies; Understanding, Fluency, Problem Solving and Reasoning. We will share our experience of maths planning, demonstrating the ways we incorporate all proficiencies in planning and teaching. We ask that you bring along a copy of a weekly maths planner to refer to during this session. You will walk away with a deeper understanding of the proficiencies and activities to support your teaching from Prep to Grade 6.

Repeated as A8

E9 Dice & Cards: Tools for Developing Fluency and Reasoning

Ellen Corovic - The Mathematical Association of Victoria, VIC
Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years F to 6**

Teachers will be elbow deep in dice and cards during this workshop. The session will focus on developing mathematical fluency and reasoning in students through the use of hands-on and engaging card and dice games. Teachers will be armed with a range of activities and we will explore how to easily differentiate them ready for a range of student learning needs.

Repeated as B7

E10 Improving Maths Outcomes Through the Use of Assessment Diagnostics

Alexander Young - Ingenious Technological Enterprises, TAS

Lecture **Years F to 6**

Commercial Presentation

The author collaborated with schools in three states to develop a 'world first' means by which teachers monitor the quality of their teaching in assessment for learning. This has enabled teachers to "change their lives and that of their students", or as a speaker at the ACEL 2012 conference put it; "The students in her school, on average, learn at twice the pace of the nation and at twice the usual depth". Teachers achieve this by using their school's photocopier as a high speed scanner providing forensic feedback on each student's learning needs. This has transformed teaching enabling huge productivity gains and improved teacher satisfaction.

Repeated as B8

E11 Google 'Maths' - Using Google Apps for Maths Learning and Teaching

Mark Gleeson - Lumen Christi Catholic Primary School, VIC

Workshop **Years F to 7**

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 Docs, Sheets, Slides, Draw, Maps, Forms and Sites can be used by teachers and students in your lessons will be presented (and explored by participants if they have internet access).

Note: Bring your own laptop (tablet if Google apps installed on it will work for many examples but laptop recommended for all options). Google account recommend for participation. You can still be an observer of possibilities if you don't have a Google Account

Not Repeated

E12 Volunteering in Tanzania

Jenny Clark - VIC

Lecture **Years F to 12**

Working overseas in a developing nation can be a wonderful experience both personally and professionally. I have just completed a 12 month placement with Australian Volunteers International as a teacher trainer / curriculum developer in Arusha, Tanzania. I will talk about my work with teachers, volunteers and students at a small NGO to improve teaching and learning. The work included mentoring teachers, putting organisational procedures in place and producing curriculum materials for local teachers and volunteers to use. This session is to give anyone interested in volunteering a taste of what a positive experience it can be.

Repeated as G7

E13 A Revolutionary Approach to Teaching About Angles

Dr Heather McMaster - University of Sydney, NSW

Workshop **Years 2 to 8**

Children are taught that angles are measured in a unit called a degree. But where do degrees come from? Fundamentally an angle is a fraction of a revolution rather than a number of degrees. Maybe children could gain a deeper understanding of angles if they first thought about them as fractions of a revolution, thereby building on their understanding of analogue time from Year 2. This 'revolutionary' idea supports the identification of angles as measures of turn in Year 3, the use of a protractor in Year 5 and reasoning about angle relationships in Years 6, 7 and 8. If you like to use a hands-on, inquiry-based approach to teaching, this is the workshop for you.

Repeated as G12

E14 Engaging Games to Develop Skills, Confidence and Higher Order Thinking

Andrew Lorimer-Derham - St Mary's Primary School, VIC

Melinda Evans - Open Universities Australia, VIC

Workshop **Years 3-10**

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.

Repeated as C14

E15 Creating Interactive Digital Worksheets with Adobe Acrobat Pro

Brian Chau - Adobe, VIC

Dr Tim Kitchen - Adobe, VIC

Computer Workshop **Years 3 to 12**

Adobe Acrobat pro not only allows users to view, make, manipulate and annotate PDF documents, it also provides the functionality to build interactive digital worksheets ideal for any mathematics topic at any level. This workshop will go through the process of turning a static worksheet into an interactive document using very simple Javascript code that can be read and worked on via an internet browser or the free Adobe Acrobat Reader.

Repeated as F20

E16 Intentionally Engaging

Greg Carroll - Australian Mathematical Sciences Institute (AMSI), VIC

Sara Borghesi - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years 3 to 12**

We all want to engage students and have them working on tasks enthusiastically with their consent. But are all engaging tasks good tasks and a productive use of class time? What is a good task? How does it draw out mathematical concepts related to the curriculum? In this hopefully engaging session we will look at tasks that we have used in class and ask the question are they good tasks or time fillers.

Repeated as H19

E17 Enrichment in the Upper Primary School

Bruce Henry - Australian Mathematics Trust, VIC

Giovanna Vardaro - Australian Mathematics Trust / Wesley College, VIC

Workshop **Years 4 to 6**

This workshop is concerned with teaching teachers of upper primary students some of the matheamtics that is particularly suitable for enrichment, either of individuals or small groups or whole classes. Participants will be encouraged to share experiences. Topics which may be covered are squares, cubes, Fibonacci numbers, prime numbers, counting techniques, clock arithmetic and problem solving.

Repeated as D20

E18 A Digital Toolbox for Teaching and Learning Maths

Britt Gow - Hawkesdale P-12 College, VIC

Computer Workshop **Years 4 to 9**

Contemporary classrooms have access to a huge range of resources beyond the traditional textbook, but which tools are most effective for student learning? Would you like to use free digital tools to implement an effective maths learning program at your school? In this hands-on, interactive workshop you will have the opportunity to trial tools such as Padlet, Google Forms, Create-a-Graph, Tesselations.org, Skitch and more, to use with middle-years students. Britt's resources are collected at http://digitaltoolbox.wikispaces.com and http://technomaths.edublogs.org.

Note: You may like to bring your own device - laptop or iPad - for this session.

Repeated as C18

E19 Exploring Symmetry with the Mathomat Template

John Lawton - Objective Learning Materials, VIC
Richard Korbosky - Edith Cowan University, VIC

Workshop **Years 4 to 9**

Commercial Presentation

An important challenge for geometry students is to 'look through' drawings by reasoning with the theoretical objects represented in them. Mathomat is a widely available classroom resource, which helps by invoking mental imagery. John Lawton will introduce Mathomat as a creative drawing tool using the published materials that support its classroom use. Richard Korbosky will take participants on a search for the underlying symmetry in real objects using Mathomat, and other materials. This session is an opportunity for teachers to familiarise themselves with Mathomat, initially as learners, and then through discussion with colleagues about its classroom potential.

Not Repeated

E20 Learning and Teaching Together - Peer Mentor Numeracy Project

Tina Fitzpatrick - La Trobe University, VIC
Dr Dona Martin - La Trobe University, VIC
Simon Turnbull - La Trobe University, VIC
Vicki Mitchell - La Trobe University, VIC
Ariana Te Arihi - La Trobe University, VIC
Jasmin O'Sullivan - La Trobe University, VIC
Adam Clusker - La Trobe University, VIC
Jennifer Curtis - La Trobe University, VIC
Elle Livingston - La Trobe University, VIC
Brent Ritchie - La Trobe University, VIC
Karen Smith - La Trobe University, VIC

Workshop **Years 5 to 9**

The work undertaken in numeracy workshops at La Trobe University capitalizes on pre-service teachers working as peer mentors across year levels. In an inclusive, judgement free environment, which promotes open dialogue, work undertaken in numeracy workshops at La Trobe university capitalizes on third year pre-service teacher practice. Our work demonstrates how to extend students' ability by assisting them to make meaningful connections to prior learning. We aim to build understanding of number for all teachers, through genuine discourse, and a non-threatening learning environment where all class members feel comfortable in being open and honest - all of which serves as a catalyst for deep learning.

Repeated as A28

E21 My Students Don't Know Their Tables!

Norrian Rundle - VIC
Michael O'Reilly - VIC

Workshop **Years 5 to 8**

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.

Note: Bring along a USB stick for resources.

Not Repeated

E22 Turning Straw into Gold

Suzanne Sinclair - Cognition Education, New Zealand
Julia Tong - Cognition Education, New Zealand

Workshop **Years 5 to 8**

Remember that old fairytale how Rumplestiltskin thought that straw could be spun into gold? Well, we believe it can happen! In this workshop we are going to explore how you can turn those straw-type multiplicative problems into rich, gold questions that will engage and stimulate your students.

Not Repeated

E23 APSMO Maths Games and Teacher Professional Development Courses Workshop

Dr Anne Prescott - APSMO Inc, NSW
Jon Phegan - APSMO Inc, NSW

Workshop **Years 5 to 8**

This workshop introduces the APSMO Maths Games as part of the APSMO Maths Enrichment Program. APSMO Inc has been providing Maths Olympiad programs to schools in Australia and New Zealand since 1987 and this year has introduced the Maths Games program to provide the opportunity to all students in school Years 5 and 6. This session will show how Maths Games assists all Year 5 and 6 students and their teachers to improve mathematical problem solving abilities. By using five contests linked to specific problem solving strategies, students' enjoyment and enthusiasm for mathematics can be a major part of the maths program in schools. The APSMO teacher professional development courses assist teachers in their problem solving activities in the classroom. APSMO Inc. is a not-for-profit organisation.

Repeated as B23

E24 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.

Note: Please bring a laptop.

Repeated as D25

E25 Spin Them Around - Rotational Activities in the Classroom

Megan Piscioneri - Chaffey Secondary College, VIC
Alisha Taylor - Chaffey Secondary College, VIC

Workshop **Years 5 to 9**

At Chaffey Secondary College, we have embraced on a new approach to teaching Mathematics across our Year 7 and 8 classes that has enhanced student understanding of various topics. Once a week, students are presented with a series of rotational activities which are both educational and fun. Students build both Mathematical and social skills when working within these small groups. During this session we will go through the process on how our rotational groups work and share some of the associated activities that go with them. The focus of the activities are based around the AusVELS number strand. We look forward to your company as we explain our journey and have heaps of fun completing some of the rotational activities.

Not Repeated

E26 Proficiency Strands in a Content Strand

Professor Derek Holton - VIC

Workshop **Years 5 to 10**

We'll look at least one area of the Content Strand that can be complemented by the Proficiency Strand. The aim here is to give an example(s) to show that understanding, fluency, problem solving and reasoning can be made part of regular class work. However it may mean a slight change of gear regarding what might be expected by students in a maths lesson. This session will be offered on the two days of the conference but with a different activity each day.

Repeated as A29

E27 Real World Data in the Palm of Your Hand

Dr Stephen Arnold - Texas Instruments, NSW

Lecture **Years 5 to 12**

The TI SensorTag is a small, inexpensive device which packs a powerful punch - it is a BlueTooth Low Energy (BLE) tool with sensors for temperature, humidity, barometric pressure, accelerometer, magnetometer, gyroscope and more. Used with an iPad, students can easily collect, view and analyse a wealth of real world data for mathematics and science, from the middle years through to seniors. From building their own weather station, to exploring the mathematics and physiology of exercise and dance the opportunities for rich mathematical exploration are truly exciting. All in a tiny device that fits in your hand and costs less than $40! Come along and have a play.

Repeated as F29

E28 Statistics Learning Centre Videos and Resources Enrich Learning

Dr Nicola Petty - Statistics Learning Centre, New Zealand

Lecture **Years 6 to 12**

Commercial Presentation

The internet abounds with resources for teaching statistics, but finding and evaluating them is time-consuming and it can be difficult to know what to use. In this workshop we will examine what to look for in resources, and how they can be used to enable learning and make better use of teachers' time. This will include theory behind multi-media learning and the concept of the 'flipped classroom'. About one half of this presentation will showcase the materials produced by Statistics Learning Centre. Statistics Learning Centre is the main provider of resources for teaching statistics in New Zealand high schools. www.statslc.com

Note: You are welcome to email help@statslc.com ahead of time for a teacher trial login.

Repeated as B29

E29 Check the Clues: Solving Word Problems

David Dunstan - AISWA, WA

Workshop **Years 7 to 9**

The Problem Solving and Reasoning proficiencies are key aspects of the mathematics curriculum. This session will highligh the role that mathematical language and reasoning play in solving word problems. The problems are linked to the Australian Curriculum to assist teacher planning. Co-operative group learning principles will be applied in this hands-on session. Participants will leave with a wealth of ideas.

Not Repeated

E30 Every Student Learning Something Different - Calm or Chaos?

John Rainbow - Upper Yarra Secondary College, VIC

Lecture **Years 7 to 10**

We're all used to 'token differentiation': giving easy, medium or hard versions of practice work to students. But this still requires that all students learn the same maths at the same time. This year, we have been trialing something bold: true differentiation. Different students working on completely different things every lesson for this semester. So how do our lessons look now? Calm or chaos? Hear about our experiences, both positive and negative, and see what resources we used for both hands-on learning and computer-aided assessment.

Repeated as F36

E31 Fun with Functions Using Balloons and TI-Nspire

Shelley Cross - St Hilda's School, QLD

Karleigh Nicholls - St Hilda's School, QLD

Workshop **Years 7 to 10**

In this hands-on workshop you collect data using balloons, draw scatterplots on the TI-Nspire APP or calculator, and learn about different types of functions as you analyse the plots. These activities are ideal as an introduction to relationships and functions for students in Years 7 to 10, as they engage students through a hands-on and technological approach to working mathematically.

Note: iPad with TI-Nspire CAS APP installed.

Not Repeated

E32 Visual, Digital and Dynamic Ways to Explore Algebra

Peter Fox - Texas Instruments, VIC

Workshop **Years 7 to 12**

Once our students realise that "a picture writes a thousand equations", they may be encouraged to swap their selfie sticks for a CAS. Participants in this workshop will be provided with powerful visuals that help build mathematical interest, expressions and equations. Have you ever noticed that $(1 + 2 + 3\ldots)\ 2 = 13 + 23 + 33 \ldots$ we can show this visually with just a couple of simple diagrams! Can you prove it? In the words of that famous builder, "Yes we can!" Examples include content applicable to junior levels right through to Year 12 proof by induction, it's really not as hard as it sounds.

Not Repeated

E33 Transformations of Functions Using Symmetry

Brett Stephenson - Guilford Young College, TAS

Workshop **Years 7 to 12**

This workshop will start with an investigation of symmetry in dance and lead into the use of symmetry to graph transformations of functions with a diversion into group theory algebra on the way. This workshop can be used for all levels from Year 3-12 although the function transformations covered will be from the Mathematics Methods courses. The Casio ClassPad will be used to assist with the graphs of the transformations and will be available at this workshop.

Note: Please bring a graphics calculator to the session if you have one.

Not Repeated

E34 Systematically Strengthening the Core Topics From Year 7 to 12

Bryn Humberstone - Caulfield Grammar School, VIC
Kevin White - Caulfield Grammar School, VIC
Sarah Wills - Caulfield Grammar School, VIC

Lecture **Years 7 to 12**

This year our teaching team set out to strengthen student learning in three key topics that recur throughout secondary school: Linear Relations, Quadratic Relations and Trigonometry. By working through core understandings and common misconceptions, we designed extended response questions, rich iPad tasks and formative assessment activities for students from Year 7 to 12 so that they are systematically exposed to important ideas, even before some of the topics are formally introduced. Come and see what we made, and hear our reflections on how this project went.

Not Repeated

E35 It's All About the Data

Rodney Anderson - Moreton Bay College, QLD

Workshop **Years 7 to 12**

Data is the most powerful and influential mathematical instrument in the world today! Google collects more than one billion pieces of data from their search engine, every day! For example, Google correlate provides an insight into just how powerful data can be. This workshop will explore ways to collect, distribute and analyse data in a time efficient and mathematically effective ways. Participants will receive prepared activities and worksheets and participate in rapid data collection activities.

Repeated as A37

E36 Enhancing the Teaching and Learning Mathematics with Excel

Karim Noura - Bayside P-12 College, VIC

Workshop **Years 7 to 12**

In this workshop, teachers will share the experience of using Excel in teaching and learning mathematics especially in the area of Data & statistics, linear equations and graphs and also in solving problems in measurements such as find the maximum area of a rectangular paddock and the maximum volume of any rectangular box you may make of a A4 paper. However, in this workshop we will have the opportunity to solve some hard Maths problems or non-routine maths problems by using Excel.

Note: Please bring a scientific calculator to this session,and bring your own laptop - fully charged.

Repeated as C33

E37 Whiteboarding in the Mathematics Classroom

Dietmar Schaffner - Penleigh and Essendon Grammar School, VIC
Maria Schaffner - Penleigh and Essendon Grammar School, VIC

Workshop **Years 7 to 12**

This workshop will explore the opportunities that whiteboarding offers as a pedagogical technique, particularly in mathematical problem solving. Participants will be led through some sample whiteboarding activities as well as the theoretical foundations that underpin the technique. The presenters will also reflect on how whiteboarding has improved their students' engagement, quality of discourse and setting out of solutions, as well as the immediacy and accuracy of the feedback they can offer their students. Although the sample activities will be taken from senior curriculum, they will have some application in the middle school.

Repeated as A38

E38 FX Draw - The Maths Teacher's Swiss Army Knife

Paul Hooper - Efofex Software, WA

Computer Workshop **Years 7 to 12**

Commercial Presentation

FX Draw is the mathematics teacher's complete toolkit. It can be used to draw anything, demonstrate items and solve problems. This session will show you the tools available and how to use them. Great for long time users or for new teachers who have the most to gain out of this comprehensive package for Windows and Mac.

Note: You will get the most from the session if you have FX Draw 5 installed on your computer.

Repeated as A39

E39 Essential Maths for the Australian Curriculum, Cambridge Senior Maths and Cambridge HOTmaths - A Guide to Cambridge's Online Resources Powered by HOTmaths

VJ Gunawardana - Cambridge University Press, VIC

Computer Workshop **Years 7 to 12**

Commercial Presentation

HOTmaths is Australia's premier online resource to teach and learn mathematics. This year Cambridge has loaded the new editions of the Essential Mathematics for the Australian curriculum series (7-10) and the new Cambridge Senior Maths for Australian Curriculum/VCE series (11-12) onto the HOTmaths platform. This workshop will highlight how these new titles have been integrated with HOTmaths and demonstrate how to navigate through all 3 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.

Repeated as D11

E40 Beyond the Rational

Professor Terence Mills - Bendigo Health, VIC

Lecture **Years 8 to 12**

Rational and irrational numbers arise in Year 10A of the Australian Curriculum. What should students learn about irrational numbers? Why should students learn about irrational numbers? What interesting exercises about irrational numbers are suitable for Year 10A? How can we connect irrational numbers to other parts of mathematics, or other fields of study? We consider these questions in light of the aims of the Australian Curriculum. Also, we will explain why irrational numbers are fascinating. This work has been done in collaboration with Mehdi Hassani (University of Zanjan).

Repeated as G40

E41 Going Round in Circles

Jenny Curtis - St Mark's Anglican Community School, WA

Workshop **Years 8 to 12**

Find out some interesting facts about some of the world's most famous Ferris wheels and use this context to help motivate your students to develop a conceptual understanding of Pi by finding diameters, circumferences and areas of circles, using the TI-Nspire CAS calculator. You will also explore equations of circles, Circle Geometry and graphs of trigonometric functions in this session.

Note: Loan calculators will be available at this session.

Repeated as F42

E42 Mathspace - Leading the World in Adaptive Learning

Mohamad Jebara - Mathspace, NSW

Workshop **Years 8 to 12**

Not all adaptive learning is created equal. Many of today's 'adaptive' solutions consist of a limited content pool with a rules-based decision tree. These products may seem adaptive but are essentially pre-determined adaptive learning - a contradiction in terms. In this presentation I will assign a hand-written adaptive diagnostic test, the test will be personalised depending on your answers, and at the end of the session in the space of 45 minutes I will tell you all your strengths and weaknesses. You just need to bring a phone or tablet. Come and see why Sydney-based Mathspace is taking the US by storm with its adaptive learning solution.

Repeated as A43

E43 Classroom and Computer Games for Visual Quadratic Functions

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 9 to 11**

This workshop will focus on ways of helping students to understand quadratic functions and graphs with hands-on activities and related computer games related to jumping kangaroos.

Not Repeated

E44 Geometry Expressions - What an Amazing Program

Neale Woods - Distance Education Centre Victoria, VIC

Workshop **Years 10 to 12**

Geometry Expressions (GX) is a constraint based geometry program. This allows the user to create dynamic geometric constructions and then algebraically manipulate the variables created. The truly exciting aspect of GX is the ability of the user to export files into other forms such as HTML and Lua apps. Once you create the geometrical construction, you are a few clicks away from converting it into other applications. In this workshop, participants will see Geometry Expressions in action and have a hands-on opportunity to trial some of the Lua apps created using TI-Nspire CAS and other technologies.

Note: Participants are encouraged to bring their own TI-Nspire CX CAS calculator/software, laptop or tablet to run the applications created by the Geometry Expressions software.

Not Repeated

E45 Around the World in 80 Days (or 60 Minutes) - A Function Exploration

Stephen Julian - Mandurah Catholic College, WA

Lecture **Years 10 to 12**

Have you ever wondered which functions could be used to model the outline of some of the world's most famous man-made and natural structures? In this session we will explore the use of function transformations and restricted domains in displaying combined graphs on a CAS. You will walk away with a ready made lesson to use with your own classes.

Note: Bring your own CAS if you wish, however a limited number of TI-Npsire CAS will be available to use during the session.

Not Repeated

E46 New Study Design Content Using the Technology of the Casio ClassPad

Kevin McMenamin - The Peninsula School, VIC

Workshop **Years 10 to 12**

The introduction of new content and techniques into Units 1-4 provides the perfect opportunity to explore their detail and use using technology. This will be a hands-on experience that will utilise the Spreadsheet, eActivity and statistics applications of the Casio ClassPad to model some of the new approximation techniques, sampling procedures and probability. Newton's Method, Bisection Method, Hypothesis testing and sample generation will be just a few of the new concepts featured. Come along and enjoy the experience.

Note: Bring along your own calculator. Some ClassPads will be avaialable for loan.

Repeated as A48

E47 ClassPad Support for the New Mathematical Methods

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

Workshop **Years 11 to 12**

This workshop will provide information on how the ClassPad II can be used to develop ideas that are new to the Mathematical Methods course that are included in the 2016-2018 Study Design.

Note: BYO ClassPad if you can. Loan units will be available.

Not Repeated

E48 How to Teach Maths Methods, If You Must

Marty Ross - VIC

Lecture **Years 11 to 12**

Mathematical Methods is, to say the least, a clunky subject. It is here and there, in turn pedantic then blasé, containing mixed and muddled messages, and a fair dose of error. How to make sense of it? How to teach it? In this presentation we'll do our best to locate and to follow some mathematical threads in Methods' tattered fabric. Well take a careful look at textbook presentations and past exams, including the 2015 exams.

Not Repeated

E49 ClassPad and the New 2016 VCE Further Mathematics Exam

Charlie Watson - The Tuition Centre, WA

Lecture **Years 11 to 12**

This option will focus on the use of ClassPad in teaching and assessing Units 3&4 of Further Maths using the new study design in 2016, with a glance at preparatory work from Units 1&2 of General Math. Participants will develop an awareness of key ClassPad skills that students of this course should develop and 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 let the ideas wash over you.

Note: You may choose to bring your own Casio ClassPad (old or new model) - a few available to loan on day.

Repeated as C46

E50 How to Use Video Lessons and Performance Data to Improve VCE Results - Years 11 & 12
Ben Sze - Edrolo, VIC

Lecture **Years 11 to 12**

Commercial Presentation

Edrolo have partnered with the MAV to create the leading VCE resource for Methods and Further. Using a combination of interactive video tutorials and online exam simulation Edrolo allows teachers to drive better VCE results. Edrolo can be used for (1) exam revision, (2) SAC prep, (3) blended and flipped learning. This workshop will showcase how 200 schools are using Edrolo to improve the results of 25,000 students.

Repeated as A54

E51 University Mathematics as SAC Topics
Joel Black - Freelance Educator, QLD

Lecture **Years 12 to 12**

The evaluation of university mathematics topics as possible SAC topics is discussed. Various topics from sequences and series, complex analysis, differential equations, and integration theory are presented, with hints as to how these topics may be developed to link in with the Year 12 mathematics curriculum. The challenges of exploring these topics using CAS calculators will be touched upon. This presentation is intended for less-experienced teachers of Year 12 mathematics, but all are welcome.

Repeated A55

SESSION F: 10:45am-11:45am Friday 4th December

FK1 Let Me Tell You a Story About Children's Literature and the Mathematics Classroom
Dr Leicha Bragg - Deakin University, VIC

Keynote **Years F to 6**

Stories can evoke happiness, a sense of adventure and thrill, an imaginative journey to a faraway landscape. A great book will not let us put it down. We are captivated. These are emotions I wish for all my students to feel about mathematics. I want to tap into the magnetism children's literature offers our students to enhance their experience of mathematics. For those who already possess a wonder of mathematics, I want to bolster their experience of literature and witness the joy books bring us. This keynote explores ways to enrich your mathematics lessons through stimulating children's literature.

Leicha Bragg is a Senior Lecturer in Mathematics Education in the Faculty of Arts and Education at Deakin University, Melbourne. Her research interests include student engagement, improving teaching practices through a self-study collaborative group, mathematical reasoning, and preservice teacher education. She has been awarded several awards for teaching excellence in higher education. Her interest in making mathematics come alive saw her undertake research in implementing mathematics games in the primary classroom. Her current research explores the creation of rich mathematical tasks through the use of children's literature. Koala Lou by Mem Fox is one of her favourite children's books but sadly she will not be trying out for the Bush Olympics next year.

FK2 The Mathematical Magic of the Simpsons
Burkard Polster - Monash University, VIC

Keynote **Years F to 12**

Who isn't a fan of The Simpsons, arguably the most popular TV show of all times? And what's the secret of its success? Obviously all the mathematics the writers have secreted into countless episodes. In this presentation Burkard Polster - Melbourne's answer to Professor Frink - will take you on a mindbending mathematical tour of Springfield.

Burkard Polster spends most of his professional and leisure time doing fun and beautiful maths. He is a mathematics lecturer at Monash Uni, the Mathologer on YouTube and, together with Marty Ross, one half of Melbourne's Maths Masters. Their many projects can be explored at qedcat.com.

F3 Working Mathematically with Infants

Douglas Williams - Mathematics Centre, VIC

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.

Not Repeated

F4 Maths 'N' Movement - Maths is Fun, When it's Physical!

Rachel McCann - Maths 'N' Movement, NSW

Workshop **Years K to 6**

Commercial Presentation

Maths 'N' Movement is designed for Australian Schools and combines the Australian Maths and PD/H/PE Syllabi. Designed for teachers from Kindergarten to Year 6 it provides a fun way to effectively engage students in maths learning. By attending this session you will see how easily you can make maths fun and achieve outstanding maths results from your students. But this would not be a Maths 'N' Movement session unless you were engaged in a series of activities allowing you to experience first-hand the joy of learning in a Maths 'N' Movement environment and received loads of free teaching resources.

Note: Please where shoes you can run in as there will be very light level physical activity in this session.

Not Repeated

F5 Step by Step - Building Solid Maths Foundations from Day One

Cathy Davidson - Bacchus Marsh Primary, VIC
June Penney - Pathways to Learning - Education Support, VIC
Jenny Dockeary - Melton South Primary, VIC

Workshop **Years F to 2**

Building a firm foundation in number is essential in order to develop number sense and fluency and to strengthen students' understanding of key maths concepts. We will show how you can do this using rich, hands-on, practical and engaging games and tasks. Reinvigorate your maths lessons and discover how to unleash the potential of your classroom maths equipment. Build on your repertoire of maths ideas and explore efficient ways to maximise maths learning.

Note: Please bring a USB flash drive for electronic copies of resources.

Repeated as G2

F6 Moving Maths! How to Recharge and Energise Your Mathematics Lessons!

Johnny Alagappan - Gilson College, VIC

Workshop **Years F to 3**

Mathematical lessons at schools are often disconnected from reality and focus on abstract algorithms that put off students from Mathematics. Through structuring activities that tap into physical education as well as everyday problem solving activities, students can develop a passion and joy for Mathematical problem solving while developing critical thinking skills. In this workshop, I will be sharing some tried and tested methods that have worked extremely well with students with learning difficulties as well as those gifted in number skills. Whether you are starting off or have vast experience in teaching, these skills will transform your Mathematics lessons. Come and share in this interactive session and be prepared to have loads of fun!

Repeated as B2

F7 Maths Beyond the Four Walls

Helen Baldock - Baden Powell College P-9, VIC
Rachael Scales - Baden Powell College P-9, VIC
Beth Galea - Baden Powell College P-9, VIC

Lecture **Years F to 4**

Moving beyond the 4 Walls is an exciting school community engagement project that is aimed at connecting all parents, with current learning and strategies used in numeracy today. It is about developing parent capacities in understanding how and why the strategies viewed are used in the classroom. The project has potential for students to be prepared for and to be challenged at a deeper level through questioning and applying their skills in classroom activities. Moving beyond the 4 Walls takes the advantage of using powerful web 2.0 tools to bridge the gap between school and home, creating an enriched partnership.

Repeated as E5

F8 A Flexible Approach to Number

Peggy Ashton - Latrobe University, VIC
Jennifer Vincent - VIC

Workshop **Years F to 5**

Have you ever thought about teaching number in a different way, such as tapping into children's natural way of working with numbers? In this workshop we will explore a range of mental computation approaches for developing versatile thinking in students, and how these understandings can be applied to computation strategies.

Repeated as E6

F9 A Whole School Approach to Teaching Numeracy

Narissa Leung - Campbells Creek and Guildford Primary School, VIC
Gary Fry - Campbells Creek and Guildford Primary School, VIC
Wendy Walsh - Guildford Primary School, VIC

Lecture **Years F to 6**

In 2014 we set out to improve the numeracy teaching and learning in our small regional schools. We participated in the Bastow Leading Numeracy course together and learnt how to really dig deep and investigate and analyse current practice in order to determine areas for need across the schools. This year, we have implemented a unique whole school approach that is seeing really pleasing results. The best thing is, the work we have done in improving teaching and learning in Numeracy is now spilling across to all other areas of the curriculum.

Repeated as C5

F10 Designing for Deep Learning Using the SOLO Taxonomy

Jen Briggs - Derrimut Primary School, VIC

Workshop **Years F to 6**

This workshop will guide participants through developing learning experiences that foster deep learning using the SOLO taxonomy. Resources will be available to source a combination of rich tasks and content based learning experiences that can be used to create a learning sequence that progresses students from isolated skills in mathematics to deep relational thinking. Links will be made around collecting formative assessment to inform future teaching. Examples of primary school units created and used by Derrimut Primary School will be available for participants.

Note: Please bring a device for planning purposes. Internet access would be beneficial.

Repeated as D7

F11 Improving

Anne Erskine - FUNdaBolt Learning

Workshop **Years F to 7**

Commercial Presentation

Imagine one set of cards that can be used in early years to teach number and quantity, in middle years addition, subtraction, place value and times tables and still be being used in the upper grades to consolidate number skills, teach strategic thinking and improve memory. Anne Erskine the creator of the FUNdaBolt cards is passionate about hands-on learning through games and fun. She will demonstrating how to use these cards in all year levels, to teach fundamental maths skills and bring excitement about numbers back in the classroom. "I really like playing these games. They are so much fun." Georgia

Repeated as A10

F12 Essential Assessment - AusVELS and Australian 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 Australian Primary and Secondary schools to deliver a consistent and whole school approach to AusVELS and Australian Curriculum numeracy assessment, curriculum and reporting. Essential Assessment delivers a whole school approach to formative and summative assessment for schools and delivers differentiated assessment and curriculum aligned to the content descriptions for each strand and sub-strand of the curriculum. The model assesses and develops student knowledge within each proficiency standard and delivers a differentiated curriculum for each student and class as a whole. Consistent school wide reporting is made easy with the Essential Assessment model delivering a reportable Australian Curriculum Level or AusVELS Progression Point for each student. www.essentialassessment.com.au

Repeated as B11

F13 Eight 'Military' Maths Classroom Practices

Dr Jude Ocean - RMIT Unversity, VIC

Workshop **Years F to 12**

In this session I will talk about the ways in which 'traditional' mathematics education is military in style. We will discuss eight maths classroom practices that reflect a military agenda: silence, watchfulness, rules, commands, obedience, competition, testing, and streaming. Military systems are, by definition, not democratic systems; in fact they are the antithesis. This raises a perhaps unrecognised problem for teachers, who may inadvertently be working against democratic values when they teach mathematics using most or all of these eight practices. In this session, we will collectively discuss each of these eight practices and talk about what negative and positive effects they have in our own teaching, as well as look at workable and engaging alternative practices.

Repeated as H9

F14 Cashtivity - Collaborative Real World Learning

Brad Mathews - Cashtivity, VIC

Professor Leon Sterling - Swinburne University of Technology, VIC

Nigel Quinlan - Cashtivity, VIC

Computer Workshop **Years F to 12**

Commercial Presentation

Cashtivity is a free project-based learning platform that enables students to learn financial math, economics and business studies through real-world entrepreneurship challenges. Students can collaboratively build their own companies and experiement with their own ideas using the web application. This presentation will demonstrate the application, highlighting some of the many real-world mathematical learning opportunities.

Not Repeated

F15 The Teaching and Learning of Basic Facts

Janine Simpson - Cognition Education, New Zealand

Trevor Saunders - Cognition Education. New Zealand

Workshop **Years 1 to 7**

This workshop will focus on the teachers' role in supporting students to learn basic facts through the use of pattern identification: visual, oral, and numerical. We will look at a teaching - consolidation - memorisation model that allows teachers to develop and use targeted activities and resources which meet the specific basic fact learning needs of students.

Not Repeated

F16 Mental Thinking in the Mathematics Classroom

Richard Korbosky - WA

Workshop **Years 1 to 8**

In the classroom we are constantly asked to gain insights to whether students understand the mathematics they are using. This session introduces participants to the 'target number strategy' that can be used with for Year 1 to 8+ and beyond. The 'target number strategy' sets up organised activities which give students the opportunity to show how they mentally calculate, calculate in written form or calculate with a calculator. Mathematical ideas associated with the 'target number strategy' include whole numbers, money, decimal numbers, indices, perimeter, area and the four operations. Mathematics ideas in this session will be linked to the AC.

Repeated as A14

F17 Reciprocal Teaching in Mathematics

Thao Huynh - Sunshine College, VIC

Yvonne Reilly - Sunshine College, VIC

Jodie Parsons - Sunshine College, VIC

Lecture **Years 1 to 12**

Developing mathematical literacy by bringing understanding to written maths problems. In this session we will show you how we use this literacy based strategy to great effect when helping students build their ability to decode, comprehend and solve worded maths problems. To collect resources from this presentation please download a free QR code scanner App on to an electronic device.

Repeated as G11

F18 Visualisation and Geometry Based on Vines

Trevor Faure - Stevensville Primary School, VIC
Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 6**

Jennifer and Trevor will explore the ways Visualisation and Geometry are important to teach and how it can be used to improve teaching and learning. Using hands-on activities based on Vines activities. You will be given some concepts and ideas to assist you on how to implement these strategies within your classroom.

Repeated as D17

F19 Using Edmodo, A Social Networking Application, With Your Mathematics Classes

Angela Kotsiras - MathsTeachersOnly.com, VIC

Computer Workshop **Years 3 to 12**

In this workshop participants will learn:

1. How Edmodo, a free social learning network, can be used with their Maths classes.
2. How the presenter used Edmodo with her Year 8 and Year 10 students to improve learning outcomes and at the same time reduce the amount of time she had to spend assisting individual students with their maths problems.
3. How to set up an Edmodo account and invite members to join.
4. How to join a group, on Edmodo, comprising of workshop participants.

Note: Please bring your own laptop as iPads will not be suitable to set up Edmodo accounts.

Repeated as C16

F20 Creating Interactive Digital Worksheets with Adobe Acrobat Pro

Brian Chau - Adobe, VIC
Dr Tim Kitchen - Adobe, VIC

Computer Workshop **Years 3 to 12**

Adobe Acrobat pro not only allows users to view, make, manipulate and annotate PDF documents, it also provides the functionality to build interactive digital worksheets ideal for any mathematics topic at any level. This workshop will go through the process of turning a static worksheet into an interactive document using very simple Javascript code that can be read and worked on via an internet browser or the free Adobe Acrobat Reader.

Repeated as E15

F21 Technology Should Assist Teachers – Not Replace Them

Joseph Wright - The Educational Advantage, VIC
Joanna Tutos - The Educational Advantage, VIC
Danielle Henderson - The Educational Advantage, VIC

Lecture **Years 3 to 12**

Commercial Presentation

From the creators of Maths Mate: sQuizya! Your solution for classroom engagement and learning. Developed by teachers who recognize the needs of the modern classroom. sQuizya is an interactive library free of the usual copyright restrictions. Teachers can create or tailor work for their classes, share it with other teachers and even offer it for sale in the global community. A zApp is a user-friendly application offering a variety of instruction formats: exercises, tests, lessons, projects and even tutorials. Experience this powerful yet simple to use software and see how it can save you many hours of preparation and correction.

Note: If you are able to bring a web enabled device to this presentation you may find it assists your understanding of the activities offered.

Repeated as C17

F22 Is Perfect Differentiation Possible? These Teachers Found a Way and Save Time

Justin Matthys - Maths Pathway, VIC
Joel Smith - Maths Pathway, VIC

Lecture **Years 4 to 10**

Do your classes have 25 students with 25 different learning needs? Catering to this properly would take a superhero teacher, and none of us can differentiate perfectly on our own. A group of Australian teachers resolved to act as side-kicks for all those heroes by building Maths Pathway. Now, hundreds of teachers are catering to diversity more easily than ever before, and are saving time in marking and preparation. Now you can try it out free.

Repeated as B21

F23 Quo Vadimus? Observations of Australian Mathematics Education from Outside the Square
Dr Michael Haese - Haese Mathematics, SA

Lecture **Years 4 to 12**

As an author of leading textbooks for Australian and International School Curricula, Michael has observed the trends in global mathematics education for many years. He sees education as a means to a more peaceful and emphatic world, and 'real-world' mathematics as essential for understanding scientific order, and equally its place at the heart of human artistic endeavour. He will discuss the vitures of both traditional and modern mathematics education in Australia, including investigation and inquiry, times tables and technology, problem solving and 'real-world' contexts, and Shakespeare. He will challenge educators to consider where we are going by looking from outside the square.

Repeated as C20

F24 Maths by 3D Design (3D Printer) - Design, Create and Test
Daniel Avano - Museum Victoria - Scienceworks, VIC
Murray Walker - Museum Victoria - Scienceworks, VIC
David Perkins - Museum Victoria - Scienceworks, VIC

Computer Workshop **Years 5 to 8**

This session introduces teachers to 3D printers and how they could be used in the maths classroom. It will focus on a new education resource developed by Scienceworks for upper primary and lower secondary schools. Participants will be introduced to the software required to design objects for 3D printing and how 3D printers work.

Note: Please bring your laptop loaded with Google Chrome to this session.

Repeated as G21

F25 Bringing It All Together
Ben Dennis - Terang College, VIC

Lecture **Years 5 to 10**

In this presentation participants will hear about the experiences of Terang College as they have tranisitioned their 7/8 composite Mathematics classes into a paper less, team taught environment. Hear about the challenges of a highly differentiated classroom driven by effective use of data that incorporates the use of ICT (iPads), and where this is an emphasis on the individual and thinking process, rather than just academic skills. This session will highlight the journey one regional school has taken to increase student engagement and achievement in Mathematics including the successes and pitfalls discovered along the way.

Repeated as B24

F26 How to Run a Bridge Building Competition
Dr Peter McClive - Sacred Heart Girls' College, VIC

Lecture **Years 5 to 10**

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 to 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. Participants will receive a file of resources and tips to enable them to successfully run their own competitions.

Note: Please bring a laptop to download the zip resources file from the internet.

Not Repeated

F27 ABC - 123. AMSI - BHP - CHOOSE MATHS. 1. Who are We? 2. What is It? 3. When, Where & How?
Ann Kilpatrick - Australian Mathematical Sciences Institute (AMSI), VIC
Kerrie Shearer - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years 5 to 11**

In April of this year, AMSI (Australian Mathematical Sciences Institute) and BHP Billiton launched the CHOOSE MATHS program. The CHOOSE MATHS program will offer professional development in maths education, a support network for girls studying mathematics, encouragement of girls to undertake tertiary studies in mathematics and statistics and an awareness campaign to ensure young people are fully informed of the career opportunities available to them if they include mathematics and statistics in their degrees. This presentation will provide participants with full program details and enable access to free resources for teachers of mathematics. We warmly invite you to join with us and grow the impact of CHOOSE MATHS!

Repeated as A30

F28 Using Technology to Make Formative Assessment Easier, Faster and More Effective
Bruce Jackson - Leongatha Secondary College, VIC
Lecture **Years 5 to 11**
Significant research evidence in combination with practical classroom experience has highlighted the difficulties and complexities of implementing formative assessment in classrooms. Technology offers the potential to assist with formative assessment however in practice, the information provided may not be well suited to informing learning. Drawing from both practical classroom experience and academic research, this presentation provides insights and strategies to help teachers successfully implement formative assessment in their classrooms. It also explores the benefits technology can bring to this process and the key requirements for easier, faster and more effective implementation.
Repeated as A31

F29 Real World Data in the Palm of Your Hand
Dr Stephen Arnold - Texas Instruments, NSW
Lecture **Years 5 to 12**
The TI SensorTag is a small, inexpensive device which packs a powerful punch - it is a BlueTooth Low Energy (BLE) tool with sensors for temperature, humidity, barometric pressure, accelerometer, magnetometer, gyroscope and more. Used with an iPad, students can easily collect, view and analyse a wealth of real world data for mathematics and science, from the middle years through to seniors. From building their own weather station, to exploring the mathematics and physiology of exercise and dance the opportunities for rich mathematical exploration are truly exciting. All in a tiny device that fits in your hand and costs less than $40! Come along and have a play.
Repeated as E27

F30 The Joy of Informatics
Jan Honnens - Christ Church Grammar School, WA
Workshop **Years 5 to 12**
Informatics is mathematics related to computer programming and includes topics such as algorithms, networks and logic. In this session we will go through some of the past questions from the Computational 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.
Not Repeated

F31 More Mathemagical Marvels to Liven Up Lessons
Andrew Wrigley - Somerset College, QLD
Wally Brodar - Somerset College, QLD
Lecture **Years 6 to 12**
Enjoy an interactive and entertaining stroll through a variety of mathematical ideas in order to spark interest and discussion in the classroom. Basic number operations, algebra, geometry and probability are included, so a calculator might be useful. It is suitable for all ages up to infinity (but not beyond). Participants will be invited to share their own 'tricks of the trade'.
Not Repeated

F32 Boosting the Performance of High Achieving Students in Examinations Through Error Analysis
Jane Irvin - Morayfield State High School, QLD
Workshop **Years 7 to 9**
Teaching a class of high achieving Year 8 students it became apparent that work needed to be done regarding their solutions to problem solving questions in examinations. Students were making errors that indicated that they had not 'picked up' on words in the question that impacted on the way the question needed to be answered. The concern was that this could adversely affect their result on an answer-based assessment such as NAPLAN. This workshop will share a strategy that used error analysis to teach students to analyse the questions and to analyse their own solutions to problems.
Repeated as D31

F33 Eating Fish - And Learning How to Fish
Alastair Lupton - Le Fevre High School, SA
Workshop **Years 7 to 10**
The fish - a tasty morsel that might (a) kick start some thinking about a new idea (b) inspire some extended thinking (c) drive some interesting assessment (d) … The mathematical sea is full of fish … but where to find them? In this workshop we will start by tossing you a fish, one that we prepared earlier for our Year 8 class. Once we have enjoyed chewing that over together, we will explore some good fishing 'sites and maybe help you can catch some fish of your own.
Repeated as G28

F34 Creating Balanced Assessment Tasks

Dr Rohani Mohamad - Minaret College, VIC

Workshop **Years 7 to 10**

Many may argue that we assess what we value. As teachers, we certainly value conceptual understanding, not just mere memorization or simple applications of formulae. Yet, ample research works show that teachers tend to assess more of the basic skills, and consequently, the assessment tasks that target higher-order thinking appeared limited. This presentation aims to gather participants understanding of creating balanced assessment tasks (that are based on the AusVELS proficiency standards; fluency, understanding, reasoning, and problem-solving). It also hopes to increase teachers' confidence in developing and improving our assessment practices.

Not Repeated

F35 Made By Maths - An APP Developed by the MAV

Ellen Corovic - The Mathematical Association of Victoria, VIC

Helen Haralambous - The Mathematical Association of Victoria, VIC

Workshop **Years 7 to 10**

Made By Maths is an interactive App developed by the MAV IN 2014. The App houses Mathematical Walks (or Trails). The current walk Melbourne CBD based is designed to be used by secondary students on city excursions. This session will demonstrate how to use the App and provide teaching tips and ideas for use back in the classroom. Teachers will gain experience in using the App fro themselves. Additional teacher tools have been built into the construction and these will be explored. Feedback from schools and teachers will be presented. MAV Commercial Product.

Note: Participants are requested to bring a smartphone or tablet to this workshop and download the App to their device prior to the workshop.

Repeated as A34

F36 Every Student Learning Something Different - Calm or Chaos?

John Rainbow - Upper Yarra Secondary College, VIC

Lecture **Years 7 to 10**

We're all used to 'token differentiation': giving easy, medium or hard versions of practice work to students. But this still requires that all students learn the same maths at the same time. This year, we have been trialing something bold: true differentiation. Different students working on completely different things every lesson for this semester. So how do our lessons look now? Calm or chaos? Hear about our experiences, both positive and negative, and see what resources we used for both hands-on learning and computer-aided assessment.

Repeated as E30

F37 Building a Differentiated 7 to 9 Mathematics Curriculum

Sue Prosenica - Williamstown High School, VIC

Lauren Withers - Williamstown High School, VIC

Corrine Hall - Williamstown High School, VIC

Lecture **Years 7 to 10**

In this workshop we will show the process our school followed to review, develop and implement a guaranteed and viable Year 7 to 9 differentiated mathematics curriculum. We will share where we have come in the past four years and the research investigated to develop the new mathematics program. Exploring the difference between numeracy and mathematics and the inclusion of 'in-class numeracy support', 'problem solving processes' and a 'flexible mathematics framework' were key components in this journey.

Not Repeated

F38 Hang On. I've Got It!

Dietmar Schaffner - Penleigh and Essendon Grammar School, VIC

Lecture **Years 7 to 12**

This option reports on the findings of a literature review and school-based peer research project prompted by the following scenario: a student asks a teacher for help, begins to explain their difficulty but then has an epiphany and announces that they have found the solution. Can we learn what it is that enables students to solve problems simply by reading them out aloud from such diverse research topics as cognitive neuroscience, culturally-specific orality in the teaching and learning of mathematics, tip-of-the-tongue memory lapses, the effects of aphasia and deafness on mathematical thinking and the pros and cons of linguistic determinism?

Repeated as C34

F39 Lessons From CAS. What Can We Learn? What Can Our Students Learn?
Martin Buchholtz - Rowville Secondary College, VIC
Peter Fox - Texas Instruments, VIC
Workshop **Years 7 to 12**
We're going on a question hunt. We're gonna find some good ones. We're not scared! Whether you've 'barely' scratched the surface or you're an experienced user of CAS, this workshop, just like the 'bear hunt book' will go in, over, under and through a collection of interesting and challenging questions applicable to students in Years 7 through to Year 12. Can CAS change what and how we teach mathematics? What can we learn? What can our students learn? Be prepared for challenges, be prepared to think and most of all, be prepared to question!
Repeated as D40

F40 Teaching and Learning with a Digital Resource - Exploring Instructional Models and Feedback
Vanessa Rule - Pearson, VIC
Tim Carruthers - Pearson, VIC
Workshop **Years 7 to 12**
Teaching and learning with a digital resource can provide feedback about your students' learning and your own teaching to inform the implementation of learning activities and instructional models like flipped learning; spaced vs massed practice; student self-paced learning; differentiation and mastery learning. This session will explore how the new generation of digital resources enables the integration of each of these models and how they allow increased teacher-student time, catering for individual differences and overall improved student outcomes.
Note: Participants will require a laptop or tablet able to connect to the wireless internet. Please note that this IS NOT A COMMERCIAL PRESENTIATION, even though we are from Pearson.
Repeated as A41

F41 Improving Maths Outcomes Through the Use of Assessment Diagnostics
Alexander Young - Ingenious Technological Enterprises, TAS
Lecture **Years 7 to 12**
Commercial Presentation
The author collaborated with schools in three states to develop a 'world first' means by which teachers monitor the quality of their teaching in assessment for learning. This has enabled teachers to "change their lives and that of their students", or as a speaker at the ACEL 2012 conference put it; "The students in her school, on average, learn at twice the pace of the nation and at twice the usual depth". Teachers achieve this by using their school's photocopier as a high speed scanner providing forensic feedback on each student's learning needs. This has transformed teaching enabling huge productivity gains and improved teacher satisfaction.
Repeated as A40

F42 Going Round in Circles
Jenny Curtis - St Mark's Anglican Community School, WA
Workshop **Years 8 to 12**
Find out some interesting facts about some of the world's most famous Ferris wheels and use this context to help motivate your students to develop a conceptual understanding of Pi by finding diameters, circumferences and areas of circles, using the TI-Nspire CAS Calculator. You will also explore equations of circles, Circle Geometry and graphs of trigonometric functions in this session.
Note: Loan Calculators will be available at this session.
Repeated as E41

F43 Investigating Trinomials with Integer Roots
Dr Ray Williams - St Mark's Anglican Community School, WA
Lecture **Years 9 to 11**
This session uses the TI-Nspire's ability to do algebra in a spreadsheet to investigate trinomials where the coefficient of x2 is unity. With the CAS facility, a time consuming and difficult exercise is made easy and patterns can emerge to reveal possible solutions to the question "Is there a way of finding which of these trinomials can be factorised with integers?" The results are quite interesting and lead to further areas to investigate.
Repeated as C40

F44 Learning Experiences With Transforming Graphs

Yew Fook Chan - School of the Arts, Singapore

Workshop **Years 9 to 11**

Teachers will gain an understanding on the rationale and considerations in designing appropriate learning experiences for students and obtain ready-made learning lessons for immediate use. The workshop will provide opportunities for teachers to help student:

a) Explore and investigate the transformations (translations, dilations and reflections) of graphs and
b) Understand and apply the transformations to the graphs of standard functions (e.g. linear, quadratic, trigonometric functions and etc).

Note: Please bring your own TI-Nspire CX or CAS with the latest operating software to download the tns files that are provided by the presenter.

Repeated as G41

F45 Classroom and Computer Games for Visual Trigonometry

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 9 to 11**

This workshop will focus on ways of helping students to understand trigonometry calculations and graphs with hands-on activities and related computer games. Participants will engage in group activities and receive computer games for later use.

Not Repeated

F46 Google Drive and Google Forms in the Maths Classroom

Hayley Dureau - Mount Waverley Secondary College / Texas Instruments, VIC

Lecture **Years 9 to 12**

In this workshop, participants will learn how Google Drive and Google Forms can be used to share resources (worksheet, revision material, solutions and videos) with students and collect feedback and formative assessment data. Feedback about student attitudes towards mathematics, attitudes towards CAS, aptitudes with CAS and perceived levels of mathematical understanding strongly influence subsequent teaching decisions and strategies. See how Google Forms allows you to seamlessly collect this data and use it to inform your teaching. At the completion of the workshop, participants will have sufficient knowledge of the various Google Forms question templates and analysis features to conduct illuminating surveys in their mathematics classrooms.

Note: It would be advantageous to have a laptop in the session and access to a Google account.

Repeated as B39

F47 Mathematica for Mathematical Methods Units 1 and 2

Rohan Barry - Wodonga Secondary College, VIC
Dr David Leigh-Lancaster - VCAA, VIC

Computer Workshop **Years 9 to 12**

Wodonga Secondary College is one of the schools involved in the implementation of Mathematical Methods (CAS) computer-based examination and currently has students using Mathematica as enabling technology in Year 11, having commenced in Year 10 in 2014. This workshop will look at how Mathematica has been used for teaching, learning and assessment at the school in 2015, through a collection of notebooks (interactive Mathematica files) developed for this purpose. There will also be discussion of the experiences of the teachers involved, and practical considerations related to implementation. Prior familiarity with Mathematica is not assumed.

Note: Participants should bring along a USB to copy any notebooks they wish to use

Repeated as D45

F48 Worthwhile CAS Calculator Use in This Year's 2nd Methods Exam?

Kevin McMenamin - The Peninsula School, VIC

Workshop **Years 10 to 12**

Savvy 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.

Note: Bring along your own calculator. Some ClassPads will be avaialable for loan.

Repeated as C45

F49 ClassPad and the New 2016 VCE Mathematical Methods Exam
Charlie Watson - The Tuition Centre, WA
Lecture **Years 11 to 12**
This option will focus on the use of ClassPad in teaching and assessing Units 3&4 of Methods using the new study design in 2016, with a glance at preparatory work from Units 1&2 of the course. Participants will develop an awareness of key ClassPad skills that students of this course should develop and 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 let the ideas wash over you.
Note: You may choose to bring your own Casio ClassPad (old or new model) - a few available to loan on day.
Repeated as B45

F50 Empowering CAS Skills in Specialist Maths: Vectors, Circular Functions & Complex Numbers
Trang Pham - Methodist Ladies' College, VIC
Workshop **Years 11 to 12**
Have you been trying to maximise the use of CAS technology in VCE Specialist Maths? Is CAS supposedly useful in Specialist Maths? Absolutely! Particularly with multiple-choice questions. This workshop will provide all participants with hands-on opportunity to empower their CAS skills in Specialist Maths. The main focus will be on Vectors, Circular Functions and Complex Numbers. Some past exam questions will be used to illustrate how CAS can be effectively used to answer these questions, and how powerful it is that students will be full of excitement when correct techniques are applied! Please feel free to bring along any technology tips that you may have used in your class to share with the group. The session is open to TI-Nspire CX CAS and Casio ClassPad 330 users and the featured calculator will be the TI-Nspire CX CAS.
Note: Please bring along your own TI-Nspire CAS or Casio ClassPad 330 calculator and any past multiple choice exam questions to which you think can be done on a CAS calculator.
Repeated as C47

F51 Implementing the New VCE Foundation Mathematics Study Design
Claire Delaney - Lalor Secondary College, VIC
Andros Constantinou - Lalor Secondary College, VIC
Workshop **Years 11 to VCAL**
It is nearly time to implement the new VCE Foundation Mathematic Study Design. Are you ready? Find out about some of the changes to the Study Design, including ideas on how to implement the changes. Some successful activities and assessment tasks will be presented, especially for themed units; and participants will be encouraged to share their ideas and activities in this practical workshop atmosphere. The use of technology in VCE Foundation Mathematics and essential skills for students progressing to tertiary (or further) education will also be discussed.
Repeated as D50

F52 The Product and Quotient of Two Independent Cauchy Random Variables
John Kermond - John Monash Science School, VIC
Lecture **Years 12 to 12**
The probability density function (pdf) of the product and quotient of two independent Cauchy random variables that each have a median equal to zero is calculated. The pdf of the quotient is calculated from the pdf of the product. The pdf of the product is calculated using both the method of distribution functions and the Change of Variable Theorem. Properties of the product pdf are verified and examined in a subsequent presentation. Recommended for Mature Mathematical Audiences: It contains frequent strong mathematical language, mathematical equations and mathematical procedures.
Not Repeated

SESSION F-G: 10:45am-1:10pm Friday 4th December

F-G1 Making the 4 Operations Happen for Students
Rob Vingerhoets - RVEC, VIC
Lecture **Years 3 to 7**
For too many students the four operations are not much more than a bag of tricks that you either remember or you don't. This workshop brings the 4 ops back to place value and common sense and the methods/alternatives presented give students options that work for them - and you.
Repeated A-B3

F-G2 Having Some Fun with Numeracy and Maths

Dave Tout - Australian Council for Educational Research (ACER)

Workshop **Years 5 to 11 & VCAL**

This popular, hands-on workshop will enable participants to experience a range of games and activities suitable for classroom use. The activities focus on the development of core maths skills through approaches such as co-operative group work that also encourage the development of mathematical language, the use of real-life and hands-on materials, as well as on enjoyment and having fun with maths. The activities have mainly been developed for youth and adult numeracy students but are suitable for all students, especially middle years and VCAL students. Some of the activities are available free and others are available in resources sold by the MAV.

Not Repeated

F-G3 Beginning PowerPoint (2010) for the Mathematics Classroom

Dana Frantz - VIC

Giovanni Liubicich - Ballarat High School, VIC

Workshop **Years 5 to 12**

This presentation is designed for teachers of mathematics with little or no knowledge of or experience in using PowerPoint to assist in the learning and teaching of mathematics. We will use the topic of fractions (from simple to algebraic), ratios and proportions to work with the participants, helping them explore different features of PowerPoint and develop their own PowerPoint presentation for use in a classroom. Amongst other features the participants will learn how to change backgrounds, use slide transitions and animations, insert, use and manipulate shapes, graphs, photos etc.

Note: Participants must bring a fully charged laptop which will run Microsoft PowerPoint.

Not Repeated

F-G4 Visiting the Islands to Learn About Statistical Inference

Dr Nicola Petty - Statistics Learning Centre, New Zealand

Lecture **Years 7 to 12**

"The Islands" is a free innovative online virtual world developed by UQ. It provides opportunities for students to experience the full statistical process, collecting data and running experiments. In this hands-on workshop participants will have fun learning about the statistical process, sampling distributions and statistical inference, using the Islands. This will be of benefit, both for the teachers' own understanding and for enabling them to use this in teaching at various levels of the curriculum.

Note: Please bring your own laptop or other device that can access the internet. Also email n.petty@statslc.com ahead of time if at all possible, to get a login.

Not Repeated

F-G5 Hands-On Workshop for Mathematica Beginners

Craig Bauling - Wolfram Research, USA

Workshop **Years 7 to 12**

Commercial Presentation

This introductory workshop will give attendees a hands-on opportunity to create a lesson plan in Mathematica for use within their classroom. The use of ready-made resources as well as the creation of new classroom materials will be shown. The tight integration with Wolfram|Alpha's curated datasets, Natural English Language scripting and Wolfram Demonstrations Project will be used to create engaging lesson plans.

Not Repeated

F-G6 Recursion in General and Further Mathematics Courses

Andrew Stewart - Presbyterian Ladies' College, VIC

Lecture **Years 11 to 12**

Recursion will now appear in "Number Patterns and Recursion" (General Maths) and in "Recursion and Financial Modelling" (Further Maths). This session will provide teaching examples, starting with basic demonstrations of recursive situations and working up to solution processes of simple and complex financial situations through recursion and the use of the Finance Solver. This presentation is based on, and extends, the material presented in the "Revised VCE Mathematics Study Implementation Support Workshops" presented in May and June this year by VCAA/MAV.

Note: Bring a graphic calculator.

Repeated as C-D5

F-G7 A Framework for Developing a Statistical Application Task for the New Further Mathematics Curriculum

Professor Peter Jones - Swinburne University, VIC

Lecture **Years 11 to 12**

Developing a statistical application task for your Further Mathematics students can be a challenging task. This workshop introduces the data investigation process as a possible framework for developing a task that is purposeful, statistically meaningful and that enables a wide range of statistical skills to be assessed in one general context. Bring your own technology.

Repeated as A-B7

SESSION G: 12:10pm-1:10pm Friday 4th December

GK1 Turning Engaging Mathematics Classroom Experiences Into Robust Learning

Professor Peter Sullivan - Monash University, VIC

Lecture **Years F to 6**

There is now clear evidence that more challenging open-ended tasks engage all students in learning mathematics, including those who learn easily and those who find learning mathematics difficult. The next step is to convert those engaging experiences into flexible learning that can be transferred to other contexts. This session will outline key actions for teachers including articulating the relevant mathematics and the use of similar tasks to follow up and consolidate the learning activated by the initial challenge. Sequences of such tasks and the follow up will be presented.

Peter Sullivan is Professor of Science, Mathematics and Technology at Monash University. Previously he has worked at La Trobe University and Australian Catholic University. He was a teacher at Ararat High School and Eaglehawk High School and ahas worked in Papua New Guinea for 6 years. His main professional achievements are in the field of research. His recent research includes three ARC funded projects: the /Overcoming barriers in mathematics learning /project; the /Maximising success in mathematics for disadvantaged students/ project, and the/ Influences on students' learning goals and their capacity for self-regulation/ project. He is a member of the Australian Research Council College of Experts for Social Behavioural and Economic Sciences. He is an author of the popular teacher resource /Open-ended maths activities: Using good questions to enhance learning /that is published in the US as/ Good questions for math teaching/. He is an editor of the /Journal of Mathematics Teacher Education/.

G2 Step by Step - Building Solid Maths Foundations From Day One

Cathy Davidson - Bacchus Marsh Primary, VIC
June Penney - Pathways to Learning - Education Support, VIC
Jenny Dockeary - Melton South Primary, VIC

Workshop **Years F to 2**

Building a firm foundation in number is essential in order to develop number sense and fluency and to strengthen students' understanding of key maths concepts. We will show how you can do this using rich, hands-on, practical and engaging games and tasks. Reinvigorate your maths lessons and discover how to unleash the potential of your classroom maths equipment. Build on your repertoire of maths ideas and explore efficient ways to maximise maths learning.

Note: Please bring a USB flash drive for electronic copies of resources.

Repeated as F5

G3 Rotation Groups That Actually Work

Tierney Kennedy - QLD Association of Mathematics Teachers, QLD

Workshop **Years F to 4**

Rotation groups can be brilliant if they are well-run, but can also rapidly result in a behaviour management night mare. In this session teachers will learn strategies that make rotation groups both practical and fun, including limiting setting up and cleaning up time while maximising uninterrupted time for a teacher to work with a smaller group of students. Teachers will also be provided with free templates for making activities that really work.

Not Repeated

G4 Having Fun With Maths Card Games

Richard Korbosky - WA

Workshop **Years F to 6**

Come along and have some fun! Get your students excited to learn, think and communicate mathematically with maths card games:: count, whole numbers, times and fractions. The card games are enjoyable, challenging and adaptable to different abilities and focus on ordering, addition, subtraction and multiplication. See how you can get students to practise basic facts, focus on mathematical language, and develop flexible and mental thinking strategies. Most of all see mathematical concepts in a variety of representations. We will discuss how teachers observation of students' conversations and justifications will identify misconceptions and direct future classroom planning of mathematics.

Repeated as C2

G5 Number Talks: A Powerful and Enlightening Experience

Jan Cavanagh - YuMi Deadly Centre, QUT, QLD

Workshop **Years F to 10**

Exploring simple starters to a lesson allowing and valuing many different ways of perceiving a task. Number Talks are a motivating way to encourage mental computation, and visualising a variety of different paths to an answer.

Not Repeated

G6 Warping the Australian Mathematics Curriculum

Michael O'Connor - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years F to 10**

A warp is a vertical thread that forms the basis of a weaving pattern. It is these vertical threads that hold the fabric together and give it form and structure. Similarly, there are vertical threads in mathematics that link together the horizontal layers of the yearly programs in a curriculum. This session will explore how the concepts of mathematics in the curriculum build on one another to produce a coherent and durable whole.

Repeated as A11

G7 Volunteering in Tanzania

Jenny Clark - VIC

Lecture **Years F to 12**

Working overseas in a developing nation can be a wonderful experience both personally and professionally. I have just completed a 12 month placement with Australian Volunteers International as a teacher trainer / curriculum developer in Arusha, Tanzania. I will talk about my work with teachers, volunteers and students at a small NGO to improve teaching and learning. The work included mentoring teachers, putting organisational procedures in place and producing curriculum materials for local teachers and volunteers to use. This session is to give anyone interested in volunteering a taste of what a positive experience it can be.

Repeated as E12

G8 Teacher Supply and Demand: Is There a Crisis in Mathematics?

Dr Paul Weldon - Australian Council for Educational Research (ACER), VIC

Lecture **Years F to 12**

I will present on what is known about the teacher supply and demand situation in Victoria generally, and mathematics teachers in particular. Data will include some new analysis of the Staff in Australia's Schools survey 2013 (on out-of-field teaching) and data from the most recent (2012-2013) Victorian teacher supply and demand report (for which I was lead author).

Repeated as B12

G9 Using Lego to Engage, Explore and Develop Rich Conceptual Learning Within the Maths Program

Dianne Winbanks - Inside the Brick, VIC

Rob Deakin - Inside the Brick, VIC

Workshop **Years F to 12**

Commercial Presentation

Use of LEGO® as a hands-on manipulative within the Primary and Secondary Maths Curriculum opens up an open ended realm of possibilities! LEGO® is a familiar and popular play toy that is sure to engage even the most reluctant student of maths. Teachers and students will discover the learning potential of even the most basic LEGO® elements. Through exploration, LEGO® can be utilised as a powerful tool in the development of rich conceptual understanding with an inquiry base. The use of LEGO® reinforces problem solving strategies while fostering the use of appropriate mathematical language, strengthening student ability to collaborate, communicate and inquire. This session would be appropriate for teachers of Primary school as well as Secondary School teachers in the middle years classroom.

Repeated as B13

G10 Inquiring Into Data Collection and Representation with Primary Students

Sarah Nasser - Derrimut Primary School, VIC
Mary Luatua - Derrimut Primary School, VIC
Kaelynne D'Cruz - Derrimut Primary School, VIC

Workshop **Years 1 to 7**

This workshop will take participants through a sequence of learning based on the Statistical Enquiry Cycle (SEC) from the New Zealand Mathematics Curriculum and implemented in a Year 3/4 classroom in Melbourne. Students posed questions, planned investigations, collected and analysed data, made conclusions and communicated their findings. Using an inquiry approach, students gained a deeper understanding of the purpose and process of collecting and presenting data. They became critical viewers of data and made generalisations about their own and others' graphs. The unit of work will be available to participants to adapt for their own teaching and learning purposes.

Not Repeated

G11 Reciprocal Teaching in Mathematics

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

Lecture **Years 1 to 12**

Developing mathematical literacy by bringing understanding to written maths problems. In this session we will show you how we use this literacy based strategy to great effect when helping students build their ability to decode, comprehend and solve worded maths problems. To collect resources from this presentation please download a free QR code scanner App on to an electronic device.

Repeated as F17

G12 A Revolutionary Approach to Teaching About Angles

Dr Heather McMaster - University of Sydney, NSW

Workshop **Years 2 to 8**

Children are taught that angles are measured in a unit called a degree. But where do degrees come from? Fundamentally an angle is a fraction of a revolution rather than a number of degrees. Maybe children could gain a deeper understanding of angles if they first thought about them as fractions of a revolution, thereby building on their understanding of analogue time from Year 2. This 'revolutionary' idea supports the identification of angles as measures of turn in Year 3, the use of a protractor in Year 5 and reasoning about angle relationships in Years 6, 7 and 8. If you like to use a hands-on, inquiry-based approach to teaching, this is the workshop for you.

Repeated as E13

G13 Exploring Card Games to Promote Fluency in Basic Number Facts

Linda Baron - Education by Design, VIC

Workshop **Years 3 to 5**

Be prepared to have some fun! Together we will explore the use of card games to consolidate and promote fluency, speed and interest in learning basic number facts, for children in the classroom. We will also discuss how teacher observations and classroom conversations can assist children to reflect on their learning.

Repeated as H11

G14 Adding and Multiplying, In Your Mind

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

Workshop **Years 3 to 9**

Developing 'fluency' with addition and multiplication is so important to the doing of mathematics, that it is never to late to intervene. This workshop will illustrate reasons why this is important, some cool aspects about it and one way to achieve it. At the very least you will leave with some strategies you have most likely not seen before.

Note: Please bring paper, pen, calculator (yes) and your sense of humour.

Not Repeated

G15 Robots Roaming Around Your Classroom? Why NOT? - 10 STEM Computer Programming Ideas

John Widmer - Werribee Secondary College and Mag-Net Online STEM Educators, VIC
Werribee Secondary College Students, VIC

Workshop **Years 3 to 10**

Participants will use Excel, Geogebra, flowcharts, Scratch, CODE.ORG and an Arduino robot to visualize the challenges of computer programming. What are STEM programming activities? They allow students to experience the constructive experiences that use science, technology, engineering and mathematical thinking. They can be any activity that allows the student to develop programming skills within a technology and engineering paradigm. They are an essential introduction to problem-based learning. Mag-Net believes in mixing a diverse variety of constructive experiences. The workshop will be run by the teacher and students who presented "The answer was 20 - What was the question?" at MAVCON 2014.

Note: Participants are expected to bring a programming device (laptop or pad) to the workshop. Participants are encouraged to contact the presenter before booking the activity.

Repeated as H17

G16 What is Flipped Learning all About and How Does Adobe Help?

Dr Tim Kitchen - Adobe, VIC
Brian Chau - Adobe, VIC

Computer Workshop **Years 3 to 12**

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 class for engagement with skill development, project work and general learning construction with a collaborative approach facilitated by the classroom teacher. Adobe has a range of flipped learning solutions such as Adobe Presenter Video Express, Adobe Clip, Adobe Voice, Premier Elements and Premier Pro. This workshop looks at a range of these tools with a focus on Adobe Presenter Video Express for mathematics teachers.

Repeated as H18

G17 Fantastic Fractions

Ian Howard - Charles Sturt University, NSW

Workshop **Years 4 to 6**

In this hands-on workshop you will learn how to use fraction number lines and counting charts to help students understand that fractions are a part of our number system. I'll show you how counting with fractions helps students learn some of the basic fraction concepts. You will also learn how to use a simple fraction kit to develop visual imagery and ideas of equivalence. We'll then add some fabulous, simple games to play with this kit. Finally you will learn how your students can use the kit to solve basic equations using the four operations.

Repeated as B19

G18 No Textbook, No Topics, No Worries!

Dr Wendy Taylor - Bentleigh Secondary College, VIC
Toby Mahoney - Bentleigh Secondary College, VIC
Natalie Cumming - Bentleigh Secondary College, VIC

Workshop **Years 4 to 8**

This year at Bentleigh Secondary College we have trialled a new textbook-free Year 7 Maths program balancing skill development and open ended investigations. Students complete weekly skill development sheets that cover skills from early primary school to Year 8, allowing regular review of key skills, multiple opportunities to achieve success and ongoing up to date feedback for each student. Opportunities for support and extension are available to all students and learning growth is the priority. In this presentation we will unpack the program and share sample resources with all attendees.

Not Repeated

G19 Using Scratch and Minecraft in Middle Years Maths Classes

Britt Gow - Hawkesdale P-12 College, VIC

Computer Workshop **Years 4 to 9**

Have you ever wondered how you can incorporate basic computer coding or open-ended gaming environments in your maths classes? Britt has achieved successful student outcomes using Scratch as a platform for learning 'drag and drop' coding while consolidating understanding about Cartesian co-ordinates and transformations. Students immersed in the Minecraft virtual environment learned about surface area and volume. This hands-on, interactive workshop will demonstrate student learning tasks and give you the opportunity to trial Scratch. Britt's resources are collected at http://digitaltoolbox.wikispaces.com and http://technomaths.edublogs.org.

Note: You may like to bring your own device - laptop or iPad - for this session.

Repeated as D22

G20 Make A Moke

Douglas Williams - Mathematics Centre, VIC

Workshop **Years 4 to 11**

Okay, so it's a bit self-indulgent. I am co-founder of the first Moke club in the world ... and Black Douglas was a car before he was a person ... but when you Make A Moke as in this investigation it throws up surprising mathematics and interests students. A game begins the challenge and the mathematics involved includes intuitive probability, long run frequency and expectation, probability distributions, organising, displaying and analysing data, a touch of the binomial distribution and more. So, in this session, you are invited to have a bit of fun for a purpose. The alternative is to try Maths300 Lesson 126 for yourself.

Not Repeated

G21 Maths by 3D Design (3D Printer) - Design, Create and Test

Daniel Avano - Museum Victoria - Scienceworks, VIC
Murray Walker - Museum Victoria - Scienceworks, VIC
David Perkins - Museum Victoria - Scienceworks, VIC

Computer Workshop **Years 5 to 8**

This session introduces teachers to 3D printers and how they could be used in the maths classroom. It will focus on a new education resource developed by Scienceworks for upper primary and lower secondary schools. Participants will be introduced to the software required to design objects for 3D printing and how 3D printers work.

Note: Please bring your laptop loaded with Google Chrome to this session.

Repeated as F24

G22 Creating Understanding in 'Data and Statistics' in the Middle Years

Marcus Garrett - Australian Mathematical Sciences Institute (AMSI), VIC

Workshop **Years 5 to 8**

When middle years students 'do' Data and Statistics they often focus on the mechanics of recording and displaying data and overlook the intention of the information they are examining. Successful learning in Data and Statistics should inform learning across the curriculum, as students gain skills with which to measure but also to analyse and draw valid conclusions. This workshop will allow teachers to develop a lesson and assessment sequence using 'real world' data sets from their students' own experience. Students can then compare their information with that of others beyond their immediate situation, providing a first step in developing basic skills in statistical analysis that apply across a broad range of disciplines and real-world situations.

Notes: Please bring a laptop or iPad with which to take notes. Bring some A4 paper to work with.

Not Repeated

G23 Fractional Thinking in the Middle Years as a Bridge to Algebraic Reasoning

Catherine Pearn - The University of Melbourne, VIC
Dr Max Stephens - The University of Melbourne, VIC

Workshop **Years 5 to 9**

Sample solutions will show how Year 6 primary school students use 'best available' symbols to move beyond arithmetic calculation and to create original chains of algebraic reasoning to solve fraction problems. Algebraic meaning is created using symbols and syntax that may be deemed by some to be mathematically incorrect. Several efficient and successful multiplicative methods are used in contrast to less efficient methods, usually additive, which may work only with simpler fraction problems. Teachers need to recognise the underlying algebraic meaning emerging from students' solutions and help all students use more efficient strategies and build their own bridges to algebra.

Repeated as C22

G24 Statistics for Changing World: The Google Public Data Explorer - In Mathematics Classroom

Iqbal Hossain - The Grange P-12 College, VIC
Rudy Birsa - Williamstown High School, VIC

Computer Workshop **Years 5 to 10**

In today's classroom there is often the need to find reliable data on a variety of subjects. Often the plethora of data available can be overwhelming. To assist in prioritizing the type of datasets to be used, the session will introduce a new tool called, 'The Google Public data Explorer'. This tool facilitates the exploration of large datasets through visualisation. Navigation of the dataset is rendered straight forward, thereby allowing very effective communication of any findings. Students and teachers can create sophisticated visualisations of public data and embed them in their own projects and work.

Repeated as D27

G25 Working With High-achieving Students

Adjunct Professor Mike Clapper - Australian Mathematics Trust, ACT

Lecture **Years 5 to 10**

This session is designed to assist teachers who have high-achieving students in their school who may have aspirations to compete in Olympiad programs or similar. In particular, we will discuss strategies for preparing students for the AIMO (Australian Intermediate Mathematical Olympiad) which is a gateway competition into the Olympiad program. Teachers will be encouraged to try some of the questions and to learn a few of the 'tricks of the trade' in advanced problem-solving.

Repeated as C23

G26 Design and Implementation of a Project Based Learning Unit for Middle School Students in Measurement - From Conception to Delivery

Rennae Miszkurka - Caulfield Grammar School, VIC

Lecture **Years 6 to 9**

It is said that Project based learning:

- ◊ Increases motivation to learn.
- ◊ Increases collaboration skills.
- ◊ Allows a variety of acceptable solutions.
- ◊ Expects learners to work with experts as required.
- ◊ Provides a student centered learning environment.
- ◊ Is built around real problems.

This session discusses the implementation of a Measurement PBL unit in Year 7 where students completed the "Big Task", drove their own learning, completed tasks in the order they chose, attended Masterclasses at the level students felt appropriate to their learning, gave peers feedback, collaborated with others, worked with 'coaches', while being guided by 'experts'.

Repeated as B26

G27 A New Approach to Engaging Middle Year Students in Mathematics!

Adam Kruger - Lyndhurst Secondary College, VIC

Scott Rumble - Lyndhurst Secondary College, VIC

Lecture **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 Star Program, a 7-9 Secondary Mathematics program, which we developed and implemented at our college. Throughout the session we will demonstrate how we motivate students to learning, create 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.

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

Repeated as B30

G28 Eating Fish - And Learning How to fish

Alastair Lupton - Le Fevre High School, SA

Workshop **Years 7 to 10**

The fish – a tasty morsel that might (a) kick start some thinking about a new idea (b) inspire some extended thinking (c) drive some interesting assessment (d) … The mathematical sea is full of fish … but where to find them? In this workshop we will start by tossing you a fish, one that we prepared earlier for our Year 8 class. Once we have enjoyed chewing that over together, we will explore some good fishing 'sites and maybe help you can catch some fish of your own.

Repeated as F33

G29 Improving Middle School Assessment

Tricia O'Hara - East Doncaster Secondary College, VIC
Lydia Tomic - East Doncaster Secondary College, VIC

Workshop **Years 7 to 10**

Textbook generated tests are widely used in schools, but not always effectively. Tests can be long, repetitive and may not satisfactorily assess a particular cohort. Our practical presentation and documentation aims to encourage a whole unit approach to planning and assessing middle school maths - from specifying relevant skills, pre-testing these skills, choosing/writing tasks and tests that assess the skills of your class - all mapped to AusVELS. A student reflective learning grid has been developed (and tested!) that clearly shows students what the key skills are and helps them reflect on their progress after assessment tasks.

Note: Please bring a maths test (Year 7-9) you have used at school and a flash drive for documentation from the presentation.

Repeated as C28

G30 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 25 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 suggested approaches / hints that the presenter has found to enable the maximum amount of learning, with the minimum stress. The presenter has been teaching for 25 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.

Not Repeated

G31 Increasing the Rate of Students' Learning When They're Starting Behind

Troy Lowe - Mooroopna Secondary College, VIC

Lecture **Years 7 to 10**

When we examined our Year 9 student's NAPLAN and OnDemand data, we found that 50% of our students are > 1.5 years behind. More importantly, our student's growth rate was on average, < 1.0 years learning per year of school, meaning that they start high school behind and they stay behind. A key roadblock to high growth is the gaps in their prior knowledge and we need time-efficient tools to properly diagnose and correct those gaps. We've trialled a new way to teach maths to begin to reengage students and increase the rate of learning. By focusing on correcting knowledge gaps, fully differentiated work, growth mindset and effective work habits, our students are catching up.

Not Repeated

G32 Managing Differentiated Learning Needs in the Maths Classroom

Jennifer Nolan - Oxford University Press, VIC
Melinda Schumann - Oxford University Press, VIC

Lecture **Years 7 to 10**

Commercial Presentation

This session provides valuable suggestions on how to best manage the learning needs of students in a mixed-ability classroom. It includes an introduction to the features of the new Oxford 7-10 mathematics series MyMaths AusVELS Edition which has been specifically developed to support all students wherever and whenever learning happens: in class, at home, with teacher direction or in independent study. You will be guided through the comprehensive range of resources available in both print and digital forms - all designed to meet the differentiated learning needs of your students. Each participant will receive a copy of their choice of MyMaths AusVELS Edition Year 7, 8, 9 or 10/10a upon publication.

Repeated as A35

G33 Using TI-Nspire's Memory in an Efficient Way

Mehmet Altundal - Sirius College, VIC

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.

Note: Please bring your TI-Nspire Calculator to this session.

Not Repeated

G34 Flirting With a Flipped Mathematics Classroom

David Greenwood - Trinity Grammar School Kew, VIC
Bryn Humberstone - Caulfield Grammar School, VIC
Dr Rose Humberstone - Trinity Grammar School Kew, VIC

Lecture **Years 7 to 12**

In the past two years we have made over 800 maths tutorial videos to help students become more independent learners and to support differentiation within the classroom. Come and hear how we used videos to complement our teaching. We will also share some techniques used in recording and producing mathematics videos (visit https://vimeo.com/humberstone/ to see some of the videos). Note: no flirting will literally take place during this presentation; the title was chosen purely for alliterative purposes.

Not Repeated

G35 Mathematica: Learn Some Coding

Ian Willson - VIC

Workshop **Years 7 to 12**

Mitch Resnick, Lifelong Kindergarten Group, MIT Media Lab: "young people today have lots of experience and lots of familiarity with interacting with new technologies, but a lot less so of creating and expressing themselves. with them. It's almost as if they can read but not write." Conrad Wolfram, the world's most recognised advocate of computer-based maths: "the modern way to teach mathematics is to help students learn how to code, it's like composition in English—a way to teach understanding." In this workshop you will learn and use Mathematica code to do a range of mathematical activities in statistics, graphics and graphs of functions. For use with both current curriculum content and what might constitute Computer-Based Maths. Beginners and experienced users.

Note: Use Mathematica software on either your own laptop or on workstations in the computer lab venue.

Repeated as D37

G36 Managing Change: From Here to There, via Where?

Samantha Horrocks - Werribee Secondary College, VIC

Lecture **Years 7 to 12**

Who, what, when, where, why, and how do we teach? What do we want in a secondary maths department? How can we juggle changes in curriculum, assessment, research, cohorts, timing and staff? Planning for change is an opportunity. This session will give an insight into one subject leader's approach to managing long term change and making plans for the future. I will ask you to consider your own motivations, vision, drivers, role models, theoretical standpoints and how these affect your department's future goals. This session is aimed at subject leaders and those interested in having this role in the future.

Repeated as D39

G37 Using a Tablet Computer In and Out of the Maths Classroom

Peter Clerks - St Paul's Anglican Grammar, VIC
Paul Ryan - St Paul's Anglican Grammar, VIC

Workshop **Years 7 to 12**

In this session we will explore some of the ways that a tablet computer (Microsoft Surface Pro) can be used both in and out of the Mathematics classroom. A useful device, we'll look at how it can assist in writing tests, developing class notes, having students develop worked solutions to set problems, creating video clips demonstrating how to use to use the calculator amongst others.

Note: A ClassPad calculator and a charged laptop would be useful but definitely not essential.

Repeated as C35

G38 Sources of Questions and Data

Dennis Fitzgerald - Siena College, VIC

Lecture **Years 7 to 12**

Commercial Presentation

Where can we find data and questions to use in our teaching? There are many sources of data and questions that are available to us, both free and commercial. What can we leave for that extra that will contain all the resources that are needed? There are also specific topic sets of data - the AFL has a massive amount of data that can be analysed and more serious social data can be found on the Australian Bureau of Statistics website. A number of commercial examples will also be discussed.

Note: Bring your iPad with you to share ideas.

Repeated as B36

G39 Positive Education Applied to the Mathematics

Steve Andrew - Geelong Grammar School

Lecture **Years 7 to 12**

This interactive presentation will look at four ways in which the Science of Positive Psychology is applied to this teacher's Mathematics class. The intention is that it is practical as well as theoretical so that each person attending will leave with two techniques that can be used in their class immediately. It covers 'mindsets', 'character strengths', 'mindfulness' and 'gratitude'. There will be a number of exercise to illustrate the techniques. It will also discuss other aspects that could be useful in less detail and offer some challenges for us as teachers.

Repeated as B38

G40 Beyond the Rational

Professor Terence Mills - Bendigo Health, VIC

Lecture **Years 8 to 12**

Rational and irrational numbers arise in Year 10A of the Australian Curriculum. What should students learn about irrational numbers? Why should students learn about irrational numbers? What interesting exercises about irrational numbers are suitable for Year 10A? How can we connect irrational numbers to other parts of mathematics, or other fields of study? We consider these questions in light of the aims of the Australian Curriculum. Also, we will explain why irrational numbers are fascinating. This work has been done in collaboration with Mehdi Hassani (University of Zanjan).

Repeated as E40

G41 Learning Experiences With Transforming Graphs

Yew Fook Chan - School of the Arts, Singapore

Workshop **Years 9 to 11**

Teachers will gain an understanding on the rationale and considerations in designing appropriate learning experiences for students and obtain ready-made learning lessons for immediate use. The workshop will provide opportunities for teachers to help students

a) explore and investigate the transformations (translations, dilations and reflections) of graphs and
b) understand and apply the transformations to the graphs of standard functions (e.g. linear, quadratic, trigonometric functions and etc).

Note: Please bring your own TI-Nspire CX or CAS with the latest operating software to download the tns files that are provided by the presenter.

Repeated as F44

G42 Teaching Year 10 Australian Curriculum Mathematics Through Technology

Tim Grabovszky - The Hutchins School, TAS

Workshop **Years 10 to 10**

The focus will be on teaching and delivering the Year 10 Australian curriculum course (10 and 10A). We will examine, graphing and manipulating functions including straight lines and parabolas; teaching statistics with technology and producing scatter plots, box plots and time series analysis. This workshop will use TI-Nspire CAS technology. A TI-Nspire CAS graphics calculator will be provided if you do not have your own. It is advised to bring a laptop with TI-Nspire teacher software loaded.

Note: A TI-Nspire CAS graphics calculator will be provided if you do not have your own. It is advised to bring a laptop with TI-Nspire teacher software loaded.

Repeated as H45

G43 Further Mathematics 2016 - Problem Solving, Spreadsheets and Financial Modelling

Rob Vermay - VIC

Lecture **Years 10 to 12**

Problem Solving in the Financial Modelling Core is a compulsory school assessment in VCE Further Mathematics, 2016. A spreadsheet to model linear and geometric growth in financial loans and investments can quickly illustrate, and reinforce understanding of, recurrence relations (previously called difference equations). This lecture will explore the solution to a sample Problem Solving SAC using simple spreadsheet formulas in the step-by-step development of an amortisation table. A comparison with 'by-hand' and CAS solutions will be made.

Repeated as C44

G44 CAS or Pen-and-Paper: Decisions for Selected Year 11 Problems

Scott Cameron - The University of Melbourne, VIC
Dr Lynda Ball - The University of Melbourne, VIC

Workshop **Years 10 to 12**

In this workshop, participants will solve selected Year 11 Mathematical Methods (CAS) problems using CAS and pen-and-paper. There will be discussion centring on the choices that students have to make when working in an environment where the use of both CAS and pen-and-paper are expected. In addition, findings from a research study that investigated the choices made by a group of Year 11 students and their teacher on these same problems will be discussed. Participants will need to bring their own CAS calculator to this session.

Note: Participants will need to bring their own CAS calculator to this session.

Repeated as H47

G45 Further Maths Examinations This Year: How Useful Was 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 the CAS calculator was in determining their answers. The ideas of pre-programmed material and hints that should be recorded in the bound reference to assist calculator functionality will be addressed. The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students. Time will also be given to identifying the questions that are time consuming in calculator use and would be better done by other means. The session is open to TI-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad.

Note: Bring along your own calculator. Some ClassPads will be avaialable for loan.

Repeated as B42

G46 Calculus for the New, Revised and Updated Study Design

Peter Fox - Texas Instruments, VIC
Shane Dempsey - Baimbridge College, VIC

Workshop **Years 11 to 12**

How solid is your annulus? Are changes to the new, revised and updated study design giving you motions that you'd rather not integrate? Participants in this workshop will find relief in the form of activities applicable to Methods 1 and 2 through to Specialist Mathematics 3 and 4 for the calculus area of study. We'll leave the innuendos in this workshop description and fill the session with ideas and ready to use resources that you can use in your classes next year.

Repeated as H51

G47 Applications of Special Mathematics to Real Life Physics Problems

Yuriy Verkhatsky - Gleneagles Secondary College, VIC

Workshop **Years 11 to 12**

Mathematics is an essential tool for physics and physics is a rich source of inspiration and insight in mathematics. Physical concepts, arguments and modes of thinking are used in Mathematics. That is, Physics is, not only a domain of application of Mathematics, providing it with problems 'ready-to-be-solved' mathematically by already existing mathematical tools. It also provides, ideas, methods and concepts that are crucial for the creation and development of new mathematical concepts, methods, theories, or even whole mathematical domains. And physics is already accounts for significant part of Specialist Math course like Kinematics and Mechanics. Also many students study both subjects at the same time. This presentation cover some additional examples of application of Specialist Math to Physics problems like deriving formula for RMS values (integral calculus), rocket motion (differential equations), induced emf (differentiation), calculation of electronic circuits (vectors), harmonic and damped oscillations (differential equations) and other.

Repeated as C48

G48 Making VCE Mathematical Methods Visual

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 11 to 12**

Ian has produced interactive diagrams to assist both teaching and learning of each topic in VCE mathematics. This option will focus on some of the more 'difficult to explain' topics in Mathematical Methods in both years. Commercial (MAV product)

Not Repeated

G49 Dealing with the Tricky New Bits of General and Further Mathematics
Dirk Strasser - VIC

Lecture **Years 11 to 12**

Commercial Presentation

If you are teaching General or Further next year, there are a number of changes from the current courses that require particular attention. As the series editor and lead author of the new Nelson VCE Mathematics series, Dirk Strasser will lay bare the nuances and implications of the new Study Design for General and Further Mathematics, with concrete examples on how he dealt with new content.

Repeated as B49

G50 Taylor Polynomials and Approximate Integration
Joel Black - Freelance Educator, QLD

Lecture **Years 12 to 12**

Taylor polynomials are presented as the topic of an application task for Specialist Mathematics. The theory of Taylor polynomials as an extension of localised linear approximation is used to generate polynomial approximations to transcendental functions, and thence to approximate definite integrals. These approximations are compared with the answers to definite integrals calculated using the usual algebraic techniques. The SAC concludes by calculating e and pi.

Repeated as C50

G51 5 Things Teachers Get Wrong During VCE Exam Revision
Andrew Worsnop - Velvet Learning, VIC

Lecture **Years 12 to 12**

Commercial Presentation

(Attended by over 200 teachers in 2014) In my VCE classes, when exam revision came around I worried that students weren't working hard enough, that they weren't allocating their time effectively and that I didn't have a lot of control when students revised different topics at the same time. In this presentation I'll show you 5 specific techniques I used in my classes to get my students exam-ready more efficiently and effectively.

Repeated as C51

G52 Preparing Secondary Mathematics Teachers: A Review of Research
Dr Gregory Hine - The University of Notre Dame Australia, WA

Lecture **Years 7 to 12**

The international literature base concerning the preparation of pre-service secondary mathematics teachers has grown steadily over the past two decades, yet there appears to be no consensus on a best practice approach. A review of three research projects (2 American; 1 Australian) that focus on different aspects of secondary mathematics teacher preparation provides consideration for universities wishing to strengthen existing programs.

Repeated as H52

SESSION H: 2:10pm-3:10pm Friday 4th December

HK1 Kicking Goals with Maths and Stats - Applications in Sport and Gambling
Emeritus Professor Stephen Clarke - Swinburne University, VIC

Keynote **Years 7 to 12**

There are many applications in sport that are of interest to students and suitable for the classroom. The growth of sports betting and the increasing role of gambling in society suggest an understanding of the basic principles of this area is an important life skill. This talk will discuss some relatively simple methods the author has used to analyse sport and gambling. The talk will draw on some of the wide media publicity many of these studies have received. Hopefully the talk will give a feeling of the fun of being involved in this application area.

Emeritus Professor of Statistics at Swinburne University, with research interests in mathematical and statistical modelling in sport and gambling, Stephen has published over 130 papers on statistical and mathematical modelling in sport. He was a regular presenter at MAV conferences in the 80s and 90s advocating the use of sporting applications to interest students. His research covers many sports, with papers on cricket, squash, tennis, Australian rules football, soccer, rugby, golf, volleyball, the Olympic Games and gambling. Associated with Champion Data, the official collector and provider of AFL statistics, he is best known locally for his Australian rules football computer tipping predictions, which have appeared in many media outlets since 1981. His research work gains regular coverage in the press, radio and television, with guest appearances on The Footy show, The Panel, Quantum, Catalyst, A Current Affair, Today/Tonight and Sunrise.

H2 Doing Maths is Awesome - iPads, Animation and Assessment

Stephen Cadusch - Pyalong Primary School, VIC

Lecture **Years F to 6**

Details the experience of using animation as an assessment tool in the Primary Mathematics classroom. iPads make creating animation a relatively easy task, achievable by even the youngest students. Asking students to prepare an animation that displays their understanding of Maths concepts provides a visualisation of their thinking. This can be highly revealing of a students' thought processes and depth of understanding enabling assessment and identification of misconceptions, especially when students work independently. Student animation examples and suitable apps will be demonstrated.

Repeated as D4

H3 "It's About Managing Information" - Teaching Data and Statistics in Primary School

Jacinta Blencowe - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years F to 6**

Cancelled

Teaching data and statistics in primary school often results in students making 'pretty' graphs. But what's the maths in this?? This workshop involves looking at the proficiencies - Fluency, Understanding, Reasoning and Problem Solving in relation to the teaching of data and statistics in F-6 classes. Investigating the different types of data, relating data collection to real life situations, ideas for extension activities and some practical resources are explored in this workshop.

Repeated as D5

H4 What You "SEE" is What You "GET" - Visual Thinking and Learning

Mark Gleeson - Lumen Christi Catholic Primary School, VIC

Workshop **Years F to 7**

Mathematics is often seen as abstract representations of ideas. For young students, visually experiencing what maths explains symbolically is vital for real understanding. This workshop will explore the importance of visual representations in all areas of Mathematics, especially when introducing new concepts, regardless of year level. It will guide participants through a series of activities including visualising problem solving steps, moving through the stages of 'concrete - pictorial - symbolic/abstract' in all number areas of the curriculum developmentally/sequentially and present examples of students presenting their mathematical thinking and learning through visual models.

Not Repeated

H5 Problem Based Learning and Incorporating Sugata Mitra's Research in Mathematics Teaching

Julie Andrews - Parkwood Green Primary School, VIC

Lecture **Years F to 9**

On a recent study trip to New York, I asked myself the question, "do I have high expectations of my students?" After more than 10 years specialising as a consultant in mathematics, I was confident that I had established well researched methods for teaching mathematics that consistently resulted in improved student learning outcomes. When, I set myself an impossible task, however, inspired by the work of Sugata Mitra, the results permanently changed the way I teach mathematics. This workshop will explore the concept of problem based learning, based on the 5 Practices for Orchestrating Mathematics Discussions (Smith and Stein), and why a contructivist approach to teaching mathematics is essential.

Repeated as D10

H6 The Measurement Mat is Marvellous for Enlightening the Mind

Jan Cavanagh - YuMi Deadly Centre, QUT, QLD

Workshop **Years F to 10**

Students remember better and for longer if they are physically involved in their learning. Physical activity is an ideal precursor to understanding and involvement The Measurement Mat can enhance any mathematical strand from Number to Algebra, Measurement to Geometry, and Probability to Statistics! Come prepared to be involved and active! We will explore several mathematical topics!

Not Repeated

H7 Financial Numeracy - A Critical Context for Student Learning

Shane O'Connor - Victorian Curriculum and Assessment Authority (VCAA), VIC

Workshop **Years F to 10**

The MoneySmart Teaching Project is fast developing as the key source for new learning in financial numeracy. There is now a full sequence from F-10 of Mathematics units of work. The units cover all the required Mathematics skills, knowledge and understanding set out by AusVELS and the Australian Curriculum. All units have full assessment rubrics, and of course a full set of solutions to all activities! Teachers, as well as students, must develop greater skills in financial numeracy. It is critical! Current levels of financial numeracy are low amongst both young and older Australians, and the global issues with financial matters are of increasing concern to all Australians. All attendees will receive the 10 units of work currently developed. This workshop will also help schools commence that important journey to becoming a nationally highlighted MoneySmart School.

Repeated as B10

H8 Career Development and Teaching Enrichmant Through Massive Open Online Courses (MOOCs)

Dr Brenton Groves - Independent Researcher, VIC

Lecture **Years F to 12**

MOOCs are seen as replacing tertiary education but statistics show a major area is career development for teachers. A wide range of programs are being programmed specifically for this sector up to a Master's degree. Advantages and Disadvantages. There are large teaching resources designed to enrich teahing with the Kahn Academy and Mathematica™. A Hyperlink Conference Proceedings copy is available to download the URLs contained in the literature search.

Repeated as A12

H9 Eight 'Military' Maths Classroom Practices

Dr Jude Ocean - RMIT Unversity, VIC

Workshop **Years F to 12**

In this session I will talk about the ways in which 'traditional' mathematics education is military in style. We will discuss eight maths classroom practices that reflect a military agenda: silence, watchfulness, rules, commands, obedience, competition, testing, and streaming. Military systems are, by definition, not democratic systems; in fact they are the antithesis. This raises a perhaps unrecognised problem for teachers, who may inadvertently be working against democratic values when they teach mathematics using most or all of these eight practices. In this session, we will collectively discuss each of these eight practices and talk about what negative and positive effects they have in our own teaching, as well as look at workable and engaging alternative practices.

Repeated as F13

H10 From Counting Charts to Informal Strategies

Ian Howard - Charles Sturt University, NSW

Workshop **Years 2 to 4**

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.

Repeated as A15

H11 Exploring Card Games to Promote Fluency in Basic Number Facts

Linda Baron - Education by Design, VIC

Workshop **Years 3 to 5**

Be prepared to have some fun! Together we will explore the use of card games to consolidate and promote fluency, speed and interest in learning basic number facts, for children in the classroom. We will also discuss how teacher observations and classroom conversations can assist children to reflect on their learning.

Repeated as G13

H12 Using Assessment Task to Guide Teaching and Learning

Jennifer Bowden - The Mathematical Association of Victoria, VIC

Workshop **Years 3 to 6**

Jennifer Bowden has worked with the teachers at St Mary's Primary School Williamstown to develop their teaching and learning program. The focus of 2015 has been on developing a teaching and learning schedule that informs and directs teaching and learning whilst catering for the individual requirements of students. This workshop will explore the Rich task presented to students along with competitions such as the AMT. We will discuss the logistics or providing a variety of assessments to students and the impact on teaching and learning programs.

Repeated as A20

H13 Using the Model Method to Assist Students to Solve Word Problems

Lei Bao - Leopold Primary School, VIC

Lecture **Years 3 to 8**

Many primary students throughout schooling have difficulties with word problems, particularly multi-step word problems. This paper is to investigate the effectiveness of the bar model method in assisting students to solve word problems involving the part-whole relationship, comparison model and multiplicative structure.

Repeated as C12

H14 Developing a Sense of Space: Working With Three-dimensional Solids

Dr Rebecca Seah - RMIT University, VIC

Workshop **Years 3 to 8**

As one of the content strands in the Australian Curriculum, geometry is linked to the development of spatial reasoning ability. This ability is essential for understanding the world we live in and achieve advancement in science, technology, engineering and mathematics. Despite its importance, school geometry is often characterised by the memorising of vocabulary and applying formulae in routine arithmetic calculations. This session focuses on ways in which activities can be used to engage children in visualising, creating and reasoning about three-dimensional solids, leading to the development of spatial sense.

Repeated as A23

H15 Interactive Mathematics Tests for NAPLAN. Years 3, 5, 7, 9

Bill Healy - Kilbaha Multimedia Publishing, VIC

Lecture **Years 3 to 9**

Commercial Presentation

NAPLAN goes online in 2017. Have you had experience giving interactive Mathematics Tests to your students? Come along and see what it is like. In this presentation, you will be able to do a NAPLAN Maths Test interactively on your laptop. The Test will be automatically marked for you. (Don't worry - only you will know the result!) You then get to keep the test for FREE use with your students. We will then discuss the issues of the Australian Mathematics Curriculum and branched testing for NAPLAN 2016 and 2017.

Note: Bring your own laptop - fully charged.

Repeated as D18

H16 Menu Maths: A Model for Making Mathematicians

Douglas Williams - Mathematics Centre, VIC

Workshop **Years 3 to 10**

Perhaps if we offered real choice more often our students would have more success. It's about ownership. A menu is an opportunity for students to choose - and own - their mathematics learning. It is also an opportunity for teachers to combine the invitation to work like a mathematician with whole class modelling of Working Mathematically and practising mathematical skills. For much of this workshop you will be able to choose your own mathematics. We will include a Pub Menu and Menu Maths Packs from Mathematics Centre in the mix, with small group and whole class investigation and time to reflect on the teaching craft.

Not Repeated

H17 Robots Roaming Around Your Classroom? Why NOT? – 10 STEM Computer Programming Ideas

John Widmer - Werribee Secondary College and Mag-Net Online STEM Educators, VIC
Werribee Secondary College Students, VIC

Workshop **Years 3 to 10**

Participants will use Excel, Geogebra, flowcharts, Scratch, CODE.ORG and an Arduino robot to visualize the challenges of computer programming. What are STEM programming activities? They allow students to experience the constructive experiences that use science, technology, engineering and mathematical thinking. They can be any activity that allows the student to develop programming skills within a technology and engineering paradigm. They are an essential introduction to problem-based learning. Mag-Net believes in mixing a diverse variety of constructive experiences. The workshop will be run by the teacher and students who presented "The answer was 20 - What was the question?" at MAVCON 2014.

Note: Participants are expected to bring a programming device (laptop or pad) to the workshop. Participants are encouraged to contact the presenter before booking the activity.

Repeated as G15

H18 What is Flipped Learning all About and How Does Adobe Help?

Dr Tim Kitchen - Adobe, VIC
Brian Chau - Adobe, VIC

Computer Workshop **Years 3 to 12**

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 class for engagement with skill development, project work and general learning construction with a collaborative approach facilitated by the classroom teacher. Adobe has a range of flipped learning solutions such as Adobe Presenter Video Express, Adobe Clip, Adobe Voice, Premier Elements and Premier Pro. This workshop looks at a range of these tools with a focus on Adobe Presenter Video Express for mathematics teachers.

Repeated as G16

H19 Intentionally Engaging

Greg Carroll - Australian Mathematical Sciences Institute (AMSI), VIC
Sara Borghesi - Australian Mathematical Sciences Institute (AMSI), VIC

Lecture **Years 3 to 12**

We all want to engage students and have them working on tasks enthusiastically with their consent. But are all engaging tasks good tasks and a productive use of class time? What is a good task? How does it draw out mathematical concepts related to the curriculum? In this hopefully engaging session we will look at tasks that we have used in class and ask the question are they good tasks or time fillers.

Repeated as E16

H20 Hammer or Nail Gun? Add or Multiply. Choosing the Right Tool

Christine Lenghaus - VIC

Workshop **Years 4 to 9**

Are you frustrated with children not knowing basic times tables and then seeing what a struggle maths is for them when they don't? Me too! This is a solution I developed in my classroom which gives them confidence with numbers and able to experience success in maths. Enjoy an alternative to the traditional teaching of maths which engages the whole brain in a visual and tactile way, making learning concepts such as multiplication easy and how this then links in to decimals and algebra.

Note: Bring a long a USB for any documents that will be available.

Repeated as D21

H21 Using Instructional Games to Promote Understanding of Fraction Concepts and Processes

George Booker - QLD

Workshop **Years 4 to 9**

This workshop will address the representations used to introduce fraction concepts - regional models, collections with a particular emphasis on number lines which are critical in the later primary and early secondary years. As Kepner noted in 2007 'Just as counters help anchor a mental image of a whole number, number lines show how a fraction can be inserted between any two fractions, allow comparisons and serve as measurement models for computation'. A range of games will be used to develop full understanding of the concepts and lead to naming common fractions and renaming between improper fractions and mixed numbers.

Repeated as A25

H22 These 4 Visualisations Make Fractions Easy; Free Resource Pack

Joel Smith - Maths Pathway, VIC
Justin Matthys - Maths Pathway, VIC

Workshop **Years 4 to 10**

The concept of fractions is a tough one for many students. Most find basic visual models easy enough, but fall over as soon as it becomes abstracted. Often this is because students visualise fractions in a limited way; different embodiments are more useful for building different abstractions. We discuss how these models tie together and connect with higher level fractions knowledge. Participants receive a resource pack to make it easy to implement when back at school.

Repeated as A27

H23 The Teacher's Survival Guide to Using Wolfram|Alpha in the Classroom

Craig Bauling - Wolfram Research, USA

Lecture **Years 4 to 12**

Commercial Presentation

Wolfram|Alpha and Wolfram|Alpha Pro have become defacto products that your students are using daily in their Maths, Physical and Social Science classes. Likely, it is on most of the smart phones your students are using. Being prepared to address the challenges this creates and to use this technology as a supporting tool in your teaching is critical. This session will lead you through a deep understanding of the capabilities of the Wolfram|Alpha products and how to successfully use them to advance the learning of your students. No prior knowledge of Wolfram|Alpha nor Wolfram|Alpha Pro is needed.

Repeated as D23

H24 Algebra as Storytelling

Giovanna Vardaro - Australian Mathematics Trust / Wesley College, VIC

Bruce Henry - Australian Mathematics Trust, VIC

Workshop **Years 5 to 8**

This presentation describes a famework for the introduction and development of algebraic thinking, which develops in students the understanding that algebra is about 'things that happen to numbers' in a narrative context. Whilst it draws on some well understood pre-algebraic pedagogies such as machine games and back-tracking, it develops these into a fuller picture of algebraic processes using the technique of 'unambiguous labelling', which relates every algebraic expression (or equation) to the story which it tells about numbers. Many examples will be given of practical activities which will allow students to use their emerging algebraic skills to explore patterns and develop algebraic thinking.

Repeated as C21

H25 Fixing Misconceptions in Fractions Quickly and Making Sure They Stay Fixed

Tierney Kennedy - QLD Association of Mathematics Teachers, QLD

Workshop **Years 5 to 9**

Proportional reasoning is one of the most important concepts for kids to really understand before high school. In this highly practical workshop teachers will use tasks that both diagnose and fix misconceptions in fractions quickly. This workshop focuses on using a problem-based approach combined with cognitive conflict to address misconceptions that stop students understanding fractions rather than simply memorising procedures.

Not Repeated

H26 Creating an Interactive Maths Trail

Laura Barker - Fintona Girls School, VIC

Cancelled

Lecture **Years 5 to 9**

This year Fintona Girls' School's Year 9 students used the power of QR codes to create an Interactive Maths Trail. This session details the process of how the Year 9 cohort led the creation of this STEM week activity for Year 5 & 6 students at the school. In addition, this presentation also provides delegates with the opportunity to learn how to create QR codes for future use.

Note: Participants can download a QR reader onto their mobile devices if they would like to test some of the student examples from the activity. If participants wish to learn how to create QR codes during the session, they will need a computer or mobile device with internet access.

Not Repeated

H27 Convergent & Divergent Thinking

Adjunct Professor Mike Clapper - Australian Mathematics Trust, ACT

Lecture **Years 5 to 10**

This presentation is designed to assist teachers in developing enrichment programs in their school that incorporate elements of both convergent and divergent thinking in order to assist students in developing mathematical creativity. It will include exploring a very large number of activities which have been successful in the classroom.

Repeated as D28

H28 Mathematics on OneNote

Dr Ian Thomson - Ormiston College, QLD

Workshop **Years 5 to 12**

In this workshop participants will view demonstrations on the use of OneNote and gain hands-on experience in using it. OneNote is a digital note-taking app that allows you to bring together a wide range of information including text, ink, pictures, graphs and videos. It is a very helpful tool for teaching and learning mathematics, especially when used to hand-write mathematical notation onto a tablet computer screen. The OneNote Class Notebook has a collaboration section, a content library controlled by the teacher, and an individual section for each student which only they and their teacher can access. Participants will gain knowledge of how OneNote not only supports classroom learning but also facilitates online learning.

Not Repeated

H29 Retaining Maths: How to Stop Your Students From Forgetting What They Learn

Michaela Epstein - Hume Central Secondary College, VIC

Andrew Worsnop - Velvet Learning, VIC

Lecture **Years 5 to 12**

It can be incredibly frustrating to find yourself reteaching old material to students. So often it seems our students have forgotten much of what we know has been taught in the past year or even six months. This is not inevitable. It's actually easily preventable. Andrew and Michaela will present simple techniques that will allow you to spend less time revising, push students further and see hard work turn into long-term results.

Repeated as D30

H30 Computer Programming in Mathematics

Jan Honnens - Christ Church Grammar School, WA

Workshop **Years 5 to 12**

The process of writing a computer program is very similar to the process of solving a mathematical problem. 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.

Not Repeated

H31 The Classroom Organiser: Lesson Planning and Student Tracking Made Easy

Bill Murray - Mentone Girls Secondary College, VIC

Victoria Pichler - Full Circle Education, VIC

Lecture **Years 6 to 12**

Commercial Presentation

The Classroom Organiser is a unique cloud-based software system of lesson planning and student tracking. A whole year's set of lesson plans by topic and subject can be prepared at once to be used in classrooms, with students recording their progress against each lesson plan. The students' progress is automatically converted into a personal student tracker and reporting format that can be scrutinised in real time by the teacher, student and parents. It enables real time communication between parents, teachers and students, creating positive discussion about student progress.

- ◊ Creates lesson plans that contain teacher presentations and then individualised student work to be managed in a time effective manner and enabling student centred lessons to become a reality.
- ◊ Enables students to indicate to the teacher the level and standard of work they have completed, with a minimum of teacher intervention.
- ◊ Enables instant communication between teacher, student and parent about progression for that particular student, to allow individualised student programmes.

Note: Please bring your own computer and be prepared to log-in over the internet to access the system.

Repeated as B28

H32 CAS Calculators in the Middle Years Classroom (TI-Nspire CX CAS)

Dianne Hayton - Doncaster Secondary College, VIC

Workshop **Years 7 to 9**

Mastery of CAS Calculators facilitates speedy and accurate problem solving. Students in Year 11 and 12 can focus their energy on understanding Study Guide dot points if they have already mastered CAS technology in the Middle Years Classroom. This session uses topics that appear in both the middle year's curriculum and the VCE study guide, to introduce the CAS calculator to the Middle Years student. The session will cover the logistics, lesson plans, activities and assessment for using CAS in the middle years. Participants are invited to bring their own CAS to the session and participate in activities from both the teacher and student viewpoints.

Note: Please bring your TI-Nspire CX CAS Calculator - fully charged - to this session.

Repeated as C27

H33 Itching to Scratch - Block Based Programming in the Middle Years

Jennifer Palisse - John Monash Science School, VIC

Workshop **Years 7 to 10**

Scratch is programming language which allows students to learn the skills of programming in a friendly and intuitive way. This session will explore ways in which Scratch can be used in the middle years mathematics classroom which allow students to develop mathematical concepts, as well as develop their resilience when dealing with problem solving tasks. This session is designed for the novice Scratch user and will allow for plenty time to play and learn/ practice with the program, while sampling some tasks that may be used directly in the classroom. Tasks which will be explored will include sequences and series, trigonometry and Pythagoras, plotting coordinates, and generalising patterns.

Note: Please bring your own laptop which can connect to the internet (or download Scratch prior to this session).

Repeated as B31

H34 Maths and I - Authentic, Student-Orientated Tasks

Nathan Peterson - Scotch Oakburn College, TAS

Emily Peterson - Queechy High School, TAS

Workshop **Years 7 to 10**

This workshop will allow you to participate in a range of authentic and student-orientated tasks with the aim of making Mathematics more engaging for you and your students. Students will literally use themselves (their body, data and possessions) as the starting point for several tasks. These tasks are linked to the Australian Curriculum Framework and incorporate topics such as algebra and patterns, estimation, geometry, measurement and statistics.

Not Repeated

H35 Developmental Mathematics in 2015

Robert Yen - Cengage Learning Australia, VIC

Lecture **Years 7 to 10**

Commerical Presentation

How do we reach students who don't like maths and who achieve little success in the subject? How can we do things differently in 2015? This workshop will be an opportunity to discuss practical classroom ideas and learn about ten clear strategies for improving student engagement and confidence. Discover how important it is to change the learning environment as well as to change the learning tasks. There will also be a preview of Developmental Mathematics 5th edition. This successful junior maths series that was first published in 1974 has been completely updated for the Australian curriculum.

Repeated as B33

H36 Using iPads in Mathematics Teaching

Dennis Fitzgerald - Siena College, VIC

Lecture **Years 7 to 12**

How can we use iPads and similar technology in our classrooms? What apps exist for us and which of the free ones are worthwhile. This will be a discussion of my use of iPads in a Year 9 and 11 class for the first time and some suggestions on how to use them and some of the pitfalls of their introduction. Please bring your iPad if you have one and any success stories!

Note: Bring your iPad with you to share ideas.

Repeated as C32

H37 Wisdom of the Crowds

Brett Stephenson - Guilford Young College, TAS

Workshop **Years 7 to 12**

The Wisdom of the Crowds has historical significance on estimation and averages. This workshop will look at a number of activities that will investigate the wisdom (or otherwise) of using central tendency to get the best estimate of a physical quantity. Casio ClassPad Graphics calculators will be used for the activities and will be available for participants who do not bring one to the workshop.

Note: Please bring a graphics calculator to the session if you have one.

Not Repeated

H38 La Trobe - Made by Maths

Dr Katherine Seaton - La Trobe University, VIC

Lecture **Years 7 to 12**

In choosing topics and places to include in the Made by Maths app walk of La Trobe, inevitably some could not be included. Come on a walk to see some of the other real-life maths in the architecture and design of the campus.

Note: If weather is too hot or too wet, it will be a virtual walk.

Not Repeated

H39 Mathematics and Literature

Dr Tom Petsinis - Victoria University, VIC

Lecture **Years 7 to 12**

This presentation will focus on the iincorporation of mathematical ideas and the history of mathematics in my literary work. I will discuss the importance of providing a historical and cultural context in the teaching of mathematics at all levels. This is based on the understanding that student learning can be facilitated by arousing interest and curiosity in a subject. One way of doing this is through literary work dealing with mathematics. The talk will include readings from my work, including The French Mathematician , Plato's Number, Hypatia's Circle, and the recently published novel Quaternia.

Not Repeated

H40 Using 3D Graphing Tools in FX Draw and FX Graph

Paul Hooper - Efofex Software, WA

Computer Workshop **Years 7 to 12**

Commercial Presentation

The new FX Draw and FX Graph can graph in three dimensions and dynamically demonstrate 3D concepts and volumes of solids of revolution. This session introduces you to the new capabilities.

Repeated as C36

H41 More Passionless Moments

Bruce Ruthven - Melbourne Grammar, VIC

Workshop **Years 8 to 12**

Feeling jaded after another tough year - then this is the session for you. This workshop will explore more of the problems used in the Passionless Moments series in Vinculum. They are designed to break up to tedium of some lessons so that students get a chance to work on their problem solving skills with problems that often have solutions that seem counterintuitive to any form of reality. You may see an opportunity to use the problems in another way, perhaps for long term problem solving or extension for more able students, but either way you will leave with a set or handouts ready for use the next day! The problems are suitable for a variety of abilities from Year 8 to Year 12 and are guaranteed to generate some level of interest.

Repeated as D42

H42 A Woman in STEM: Observations from Twenty Years in the Field

Jude Alexander - Australian Council for Educational Research (ACER), VIC

Workshop **Years 9 to 12**

Most people grow up with a basic understanding of traditional roles – doctor, blacksmith, candlestick maker, builder. But does the average student know what's involved in becoming a process operator, fly-in fly-out geologist or research project officer? There is broad agreement that we need more people, particularly women, working in science, technology, education and maths (STEM). However 50% of women terminate their STEM careers early, with a sense of frustration at the waste of time, energy and money. In this workshop, participants will gain a deeper understanding of the diverse range of STEM industries, including what the roles entail and what the culture is like, in order to prepare young people to engage fully with these industries.

Repeated as A46

H43 From Shotgun Teaching to Differentiated Learning - Take Two

Anthony Nunan - St Patricks College, VIC

Lecture **Years 9 to 12**

After the interest shown in last year's presentation, Stop Shotgun Teaching, I have continued to develop the theory that differentiated learning is the best way for an average teacher to get exceptional results from their Year 12 students. My median for student Study Scores in 2012 was 30, and in 2013 it dropped to 29. In 2014 it was 34 with a rise in 40+ grades from 5% to 17%. I know you are thinking it was just because the students were smarter – but one statistic stood out. 25% of my students scored 2+ above their predicted GAT. Never had that happen before. A further 25% scored 5+ above their GAT prediction. That wasn't an accident. Fine tuning this year has involved Learning Analytics and Adaptive Learning solutions to help the small number of students who last year quietly managed to slip under the radar. No idea what my results will be this year with a much weaker cohort, but I'm happy to share.

Note: Bring along a device to make the most of the session.

Repeated as B40

H44 Calculus in One Easy Lesson

Marty Ross - VIC

Lecture **Years 9 to 12**

Thomas Hobbes wrote that to make sense of calculus “it is not required that a man be a geometrician or logician, but that he should be mad”. And Hobbes is hardly alone in his exasperation. But is calculus really all that difficult? Must one really be mad to understand it? In this presentation we’ll explore the beautiful and surprisingly intuitive ideas underlying calculus. We’ll view the magic of calculus, and we’ll see that the source of this magic is not madness or sorcery, but genius.

Not Repeated

H45 Teaching Year 10 Australian Curriculum Mathematics Through Technology

Tim Grabovszky - The Hutchins School, TAS

Workshop **Years 10 to 10**

The focus will be on teaching and delivering the Year 10 Australian curriculum course (10 and 10A). We will examine, graphing and manipulating functions including straight lines and parabolas; teaching statistics with technology and producing scatter plots, box plots and time series analysis. This workshop will use TI-Nspire CAS technology. A TI-Nspire CAS graphics calculator will be provided if you do not have your own. It is advised to bring a laptop with TI-Nspire teacher software loaded.

Note: A TI-Nspire CAS graphics calculator will be provided if you do not have your own. It is advised to bring a laptop with TI-Nspire teacher software loaded.

Repeated as G42

H46 ClassPad Activities: Using Technology to Support Mathematics Learning

Andrew Pateman - Wesley College, WA

Ian Sheppard - Wesley College, WA

Workshop **Years 10 to 12**

Commercial Presentation

In WA, Computer Algebra Systems (CAS) have become a part of senior school students’ mathematics toolkit in recent years. The authors of the ClassPad activities series, a largely new resource, have attempted to produce materials that encourage student understanding of course content through the use of technology and CAS in particular. The materials support the Australian Curriculum courses, General, Methods and Specialist. In this session participants will gain an appreciation of the authors’ classroom practice and philosophy, including workshopping an activity using the Casio ClassPad.

Note: Please bring Casio ClassPad or emulator.

Repeated as D49

H47 CAS or Pen-and-Paper: Decisions for Selected Year 11 Problems

Scott Cameron - The University of Melbourne, VIC

Dr Lynda Ball - The University of Melbourne, VIC

Workshop **Years 10 to 12**

In this workshop, participants will solve selected Year 11 Mathematical Methods (CAS) problems using CAS and pen-and-paper. There will be discussion centring on the choices that students have to make when working in an environment where the use of both CAS and pen-and-paper are expected. In addition, findings from a research study that investigated the choices made by a group of Year 11 students and their teacher on these same problems will be discussed. Participants will need to bring their own CAS calculator to this session.

Note: Participants will need to bring their own CAS calculator to this session.

Repeated as G44

H48 The Art of Teaching Proof

Professor Derek Holton - VIC

Sabine Partington - Carey Baptist Grammar School, VIC

Workshop **Years 10 to 12**

This session will introduce the various types of proof which are now part of the new curriculum for Specialist Maths Units 1 & 2, including proof by induction, direct proof, proof by contradiction, proof using contrapositive and geometric proofs. We will run through a few activities that could be used to introduce the concept of proof with students from Year 10 through to Year 12.

Not Repeated

H49 Algorithmics (HESS) via Distance Education

Neale Woods - Distance Education Centre Victoria, VIC
Georgia Gouros - Distance Education Centre Victoria, VIC

Workshop **Years 11 to 12**

The Distance Education Centre Victoria (DECV) offered the new Algorithmics (HESS) Study Design during 2015. Algorithmics (HESS) is a challenging subject and doing it via distance education offers additional challenges. In this workshop, participants will have the opportunity to hear from the two teachers who taught Algorithmics (HESS) at DECV in its inaugural year. The teachers will explain the basic structure of the course and the experiences they had in developing the material. This workshop will be particularly relevant for teachers who are considering offering Algorithmics (HESS) in the future but who are looking for an educational alternative in the interim.

Note: Participants are encouraged to bring a laptop or tablet to access the online Algorithmics material that will be presented during the session.

Repeated as D51

H50 Making VCE General and Further Mathematics Visual

Dr Ian Lowe - The Mathematical Association of Victoria, VIC

Workshop **Years 11 to 12**

Ian has produced interactive diagrams to assist both teaching and learning of each topic in VCE mathematics. This option will focus on some of the more 'difficult to explain' topics in both General and Further Mathematics. Commercial (MAV product)

Not Repeated

H51 Calculus for the New, Revised and Updated Study Design

Peter Fox - Texas Instruments, VIC
Shane Dempsey - Baimbridge College, VIC

Workshop **Years 11 to 12**

How solid is your annulus? Are changes to the new, revised and updated study design giving you motions that you'd rather not integrate? Participants in this workshop will find relief in the form of activities applicable to Methods 1 and 2 through to Specialist Mathematics 3 and 4 for the calculus area of study. We'll leave the innuendos in this workshop description and fill the session with ideas and ready to use resources that you can use in your classes next year.

Repeated as G46

H52 Preparing Secondary Mathematics Teachers: A Review of Research

Dr Gregory Hine - The University of Notre Dame Australia, WA

Lecture **Years 7 to 12**

The international literature base concerning the preparation of pre-service secondary mathematics teachers has grown steadily over the past two decades, yet there appears to be no consensus on a best practice approach. A review of three research projects (2 American; 1 Australian) that focus on different aspects of secondary mathematics teacher preparation provides consideration for universities wishing to strengthen existing programs.

Repeated as G52

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02 INNOVATION

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Douglas Williams - A-B1, C19, D15, E3, F3, G20, H16
Melinda Williams - C4
Dr Ray Williams - C40, F43
Sarah Wills - E34
Ian Willson - D37, G35
Dianne Winbanks - B13, G9
Lauren Withers - F37
Neale Woods - D51, E44, H49
Andrew Worsnop - C51, D30, G51, H29
Joseph Wright - C17, F21
Andrew Wrigley - A32, F31
Robert Yen - B33, H35
Alexander Young - A40, B8, E10, F41