THE MATHEMATICAL ASSOCIATION OF VICTORIA

MAV24 CONFERENCE

5 & 6 DEC 2024

CURRICULUM, PEDAGOGY AND BEYOND

Supporting our teachers and students into the future

61st Annual Conference

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ASSOCIATION OF VICTORIA

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WELCOME TO MAV24

Welcome to MAV24 – Curriculum, pedagogy and beyond: supporting teachers and students into the future.

On behalf of the MAV Board and the conference committee I invite you to the 61st Annual Conference (MAV24) in Melbourne from Thursday 5 and Friday 6 December 2024.

The focus of MAV24 is on curriculum and pedagogy in supporting and inspiring our teachers and students now and into the future. Within this broad theme and related sub-themes, we are explicitly highlighting student and teacher wellbeing in mathematics for the first time as a keynote panel option and the importance of mathematics leadership, two important areas to attend to in the future to support the teaching and learning of mathematics, which we know is complex. In this conference we are committed to addressing current challenges, sharing best practices, and envisioning the future of education. We hope to achieve this by bringing teachers, leaders, researchers, and other stakeholders together to explore innovative approaches and strategies that support teachers and students in their mathematical education journey.

Join us at MAV24 to explore how together we can continue to strive to provide students with high quality learning experiences that challenge and stimulate mathematical thinking and foster an enjoyment of mathematics.

- Ann Downton, Conference Convenor

CONTENTS

SCHEDULE

Thursday 5 December 2024	
8am - 9am	Registration
9am - 9.15am	Opening and welcome
9.15am - 10.15am	Keynote presentations
10.15am - 10.50am	Morning tea
11am - 12pm	Session A
12.10pm - 1.10pm	Session B
1.10pm - 2pm	Lunch
2pm - 3pm	Session C
3.10pm - 4.10pm	Session D
4.10pm	Networking drinks and nibbles
5pm	End of day 1
5.30pm	Conference dinner

Friday 6 December 2024	
8am - 9am	Registration
9am - 9.15am	Opening and welcome
9.15am - 10.15am	Keynote presentations
10.15am - 10.50am	Morning tea
11am - 12pm	Session E
12.10pm - 1.10pm	Session F
1.10pm - 2pm	Lunch
2pm - 3pm	Session G
3.10pm - 4.10pm	Session H
4.10pm	Conclusion of conference

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IMPORTANT INFORMATION

DATE AND TIME

MAV24 Annual Conference will be held on Thursday 5 and Friday 6 December 2024 with registration opening at 8am located in the Union Building near the exhibition hall. Five Keynotes on each day will commence at 9.15am. Thursday sessions will commence at 11am and conclude at 4.10pm followed by networking drinks to 5pm. Friday sessions will commence at 11am and conclude at close of conference at 4.10pm.

REGISTRATION

Registrations are now open and will close on Friday 22 November 2024. Register now.

CATERING

Beverage on arrival, morning tea, lunch and Thursday networking drinks will be available in the exhibition hall, Union Building.

PROGRAM

All speakers and sessions were confirmed and correct at the time of release. MAV reserves the right to amend the program details as required.

CANCELLATION POLICY

Participants who cancel their booking on or prior to the advertised closing date will receive a full refund less the cancellation fee of $35. All cancellations must be in writing and include any documentation already sent out. No refunds are available after the advertised closing date as costs will have been incurred and catering booked. (Except in the case of illness, a 50% refund is available subject to supply of a medical certificate. The certificate and application for refund must be supplied in writing to MAV within 24 hours after the event.)

For information regarding the conference including presenters, sponsorship and exhibition contact: Jacqui Diamond, Conference Manager, jdiamond@mav.vic.edu.au.

PRIVACY POLICY

We gather this information solely to manage your membership of the MAV and the services that we provide you. We will not collect information that does not pertain to this. In order to serve the purpose of the Association - valuing mathematics in society - and to improve the service we provide the MAV may use collected information for evaluation and research purposes.

SESSION SELECTION

When registration payment is received an email will be sent with a link to selection sessions. There will be a link for Thursday and for Friday sessions.

PARKING

Note: parking costs are not included in your conference registration fee.

CellOPark Pay-As-You-Go (PAYG) is an easy alternative to parking meters which allows you to pay via an app, phone or online - only pay for the time you park.

Pay-by-Plate parking meters are a ticketless system using your vehicle registration - pay hourly or daily.

For all information regarding parking at La Trobe University, Bundoora visit www.latrobe.edu.au/transport-central/car-parking/melbourne-parking.

All collected information will be protected against loss and unauthorised use or disclosure. MAV will not disclose individual information to third parties without seeking express permission first. You will always be able to request access to the information the MAV holds about you.

MAV may use collected information for evaluation and research purposes. All collected information will be protected against loss and unauthorised use or disclosure.

NEW CONFERENCE APP

We're thrilled to unveil our new events app, designed to enhance your conference experience like never before! This all-in-one tool is your gateway to a seamless and engaging event. Here's what you can look forward to:

FULL PROGRAM ACCESS

Browse the complete event program, ensuring you never miss a session, workshop, or keynote.

AGENDA AT A GLANCE

Quickly check out the agenda to see what's happening next and plan your day with ease.

FAVORITE YOUR SESSIONS

Personalise your schedule by favouriting sessions you don't want to miss. Get reminders and updates so you're always in the right place at the right time.

NETWORK WITH FELLOW DELEGATES

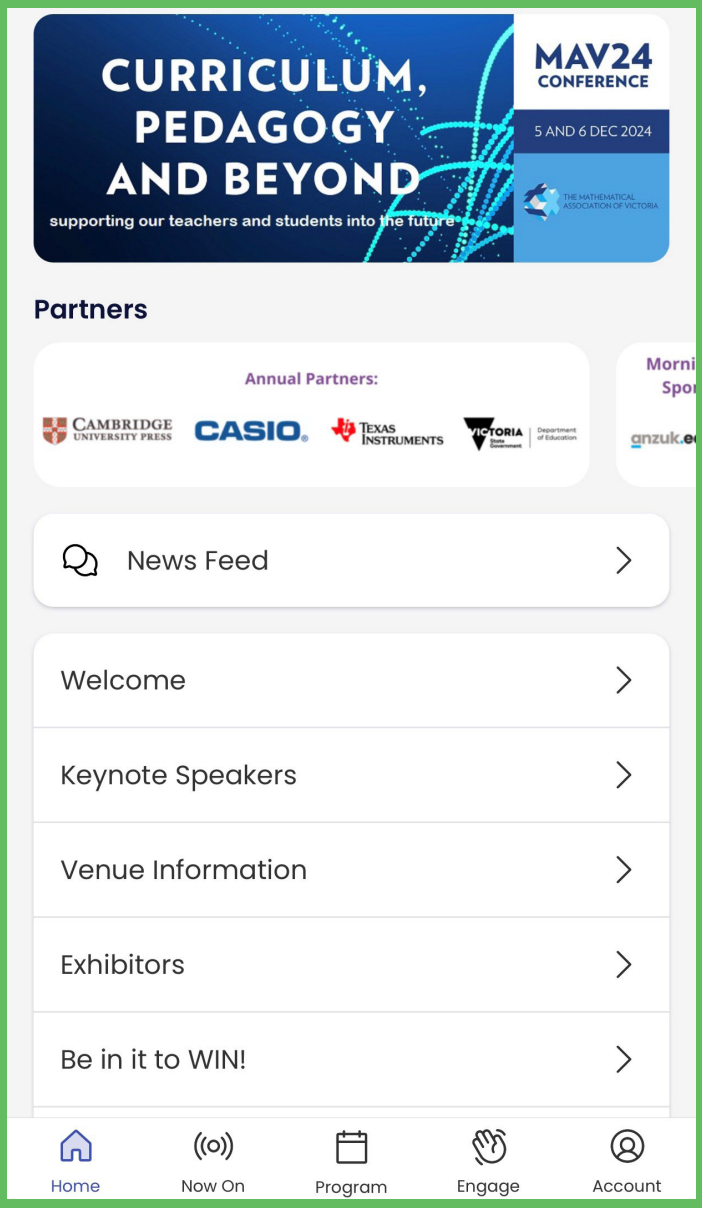
Connect with other attendees, exchange contact information, and build valuable professional relationships.

SPEAKERS AT A GLANCE

Get to know our esteemed speakers, read their bios, and find out when and where they're presenting.

GETTING TO THE VENUE

Access detailed information on the venue, including maps, transportation options, and tips for getting around.



DOWNLOAD BEFORE THE CONFERENCE

Our events app puts everything you need right at your fingertips, making it easier than ever to stay informed, connected, and engaged. Don't miss out on this essential tool. Prior to the conference, all delegates will receive a download link to the app so you can elevate your conference experience to new heights!

FOR NEWCOMERS

Following the fantastic response to last year's newcomers' morning tea, we are excited to bring it back. The MAV Annual Conference Committee warmly invites all newcomers to the MAV Annual Conference to join us for a morning tea on either Thursday or Friday.

Come meet the committee, engage in informal discussions about your current mathematical education experiences, and receive support for your first MAV Annual Conference. Don't forget to select 'yes' if you wish to attend the newcomers' morning tea when completing your session selections. Once registration payment is received, a link to session selections will be emailed to you.

ACCOMMODATION

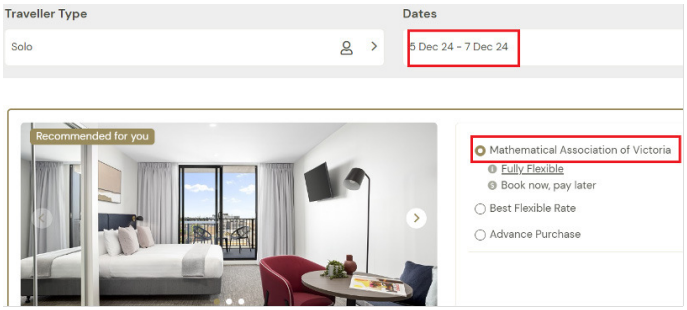
Quest Preston is offering MAV24 delegates a discounted rate for accommodation. If you need a place to stay while attending the conference, this is a good option. Please note that MAV does not receive any kickbacks for this offer.

Quest Preston offers modern serviced apartments, including studios, 1 and 2 bedroom options as well as accessible accommodation. Take advantage of the guest laundry, on-site gym and Wi-Fi internet access.

La Trobe University is a 10 minute drive from Quest Preston, or you can jump on the nearby #86 tram. This 10% offer off best available rate offer is valid for the conference dates and rooms subject to availability.

To book:

- Visit www.questapartments.com.au/properties/vic/preston/quest-preston
- Enter Promo Code: MAV24CONF (case sensitive)
- Select your dates in December
- Select your room type
- Proceed with reservation



CONFERENCE DINNER

After the remarkable success of last year's conference annual dinner, we are thrilled to announce its return for MAV24! This year, the dinner will feature an exciting array of mathematical games and will be held on Thursday 5 December 2024, following the networking drinks. Join us at The Eagle Bar, located in the Union Building at La Trobe University.

We look forward to sharing dinner and a range of fun mathematical games with you. For more details and to register for the dinner, please visit www.mav.vic.edu.au/WhatsOn/MAV24-Conference-Dinner-.

Note that the dinner cost is separate from the conference registration fee.

The bar will be open, allowing you to select your favourite beverage to complement your meal. The evening promises to be a fantastic opportunity to mingle with fellow attendees and make new connections. Please ensure your MAV profile is updated with your dietary requirements.

We can't wait to see you at The Eagle Bar, La Trobe University, for a memorable evening together!

NEW: TOPIC DISCUSSION GROUP SESSIONS

This year, the MAV Annual Conference Committee has scheduled special discussion group sessions on Thursday 5 December 2024 during session D (from 3.10pm to 4.10pm). This will be followed by the MAV24 annual conference networking drinks.

Join an engaging discussion group, where you'll gather to share knowledge, experiences and resources on a specific topic (see list below).

You'll be encouraged to actively contribute and collaborate, fostering a supportive environment and build valuable networks. The group will be facilitated to ensure productive discussions, with a strong focus and set questions provided to guide the conversation.

These discussion groups promise to be a dynamic and enriching experience, offering a unique opportunity to connect with peers and enhance your professional community.

The discussion groups cover eight topics, each has a session tailored to specific levels.

- Curriculum – Implementation of VC 2.0
- Mathematical modelling
- Building teaching networks between primary and secondary schools inclusive of transition.
- Evidence-based instructional models
- VCE and VM Teaching, Learning and Assessment 2025
- Effective assessment practices
- Leadership - mathematics and numeracy
- Mathematical wellbeing – supporting students and teachers with mathematical anxiety.

VCE REVISION PROGRAM 2024

MAV's popular VCE Revision Program is back again in 2024! This great value program promises to be a bundle full of useful insights and exam tips and strategies.

Self-paced and on demand from the day you register until the last day of exams. It will be your best study pal, and a revision resource that has everything you need.

WHAT'S INCLUDED?

- Watch over 3 hours of presentation videos from VCAA assessors.
- Hear where students tend to go wrong.
- Loads of common exam questions and how to solve them.
- Insights into a VCAA maths exam and how to smash it!
- The program is broken up into areas of study and sub-topics, making it easy to locate your handy resource or video.
- Test your understanding with our exam-style multiple choice quiz questions.
- Videos from TI-Nspire and Casio experts demonstrating how to maximise your use of CAS technology in General, Methods and Specialist exams.
- Access to exclusive live webinars with VCAA assessors where you get the chance to ask them questions.

VCAA exam assessors, TI and CASIO expert presenters.

DETAILED REVISION NOTES

All students who register receive a comprehensive book of revision notes including:

- Tips for exam success.
- Tricky past exam questions with solutions.
- Common exam questions with solutions.

One subject $65

Two subjects $110

All four subjects $180

REGISTER NOW AT

www.mav.vic.edu.au/student-activities/VCE-revision-program

'The MAV Methods Revision Program provided me with highly thorough and comprehensive notes and walk-throughs, helping me consolidate and revise what I had learnt throughout the year. I love how the presenters go through past exam questions and areas where students went wrong by breaking them down into steps that are easy to grasp. I would definitely recommend this course. It offers great advice, especially for those who want to get a high score. Really helpful.'

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TO REGISTER

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OR CALL +61 3 9380 2399

KEYNOTES: THURSDAY

PRESENTERS

EMERITUS PROFESSOR DOUG CLARK

DRAWING INSPIRATION FROM THE WORLD OF THE CHILD

Doug has directed the Mathematics Teaching and Learning Centre for 25 years. He also directed the Early Numeracy Research Project, exploring effective approaches to numeracy learning in the early years in 70 Victorian primary schools. A more recent project (Learning from Lessons) focused on the ways in teachers took what they learned from a given lesson in preparing for and teaching the following lesson. Doug's professional interests include problem solving and investigations, manageable and meaningful assessment, and the professional growth of mathematics teachers. Doug enjoys working alongside teachers and students, as they seek to make mathematics relevant, challenging, and enjoyable.

DR CHRISSY MONTELEONE

ENHANCING STUDENTS' REASONING THROUGH TEACHER QUESTIONING

Chrissy is a senior lecturer in curriculum and teaching at the Australian Catholic University, where she serves as the Deputy Head of School in Strathfield. With a wealth of experience as an early childhood and primary school educator, Chrissy plays a pivotal role in leading the NSW Partnerships initiative at ACU. She collaborates closely with various schools and sectors as part of her role. Chrissy's research is centered on enhancing critical mathematical thinking capabilities in young children, fostering communities of practice, and mentoring initial teacher education students.

ASSOCIATE PROFESSOR NAOMI INGRAM

GROWING MATHEMATICS TEACHERS AND STUDENTS

Naomi is an Associate Professor at the University of Otago and a teacher with a current practising certificate. In recent years, she was on the writing panel for the NZ Ministry of Education's Common Practice Model for Mathematics Teaching, received an Excellence in Teaching award at the University of Otago, and was the national recipient of an Emerging Teacher Educator award. Prior to her current role, she was teaching mathematics in the Sultanate of Oman. Naomi continues to be in direct contact with mathematics associations throughout New Zealand because of her lifetime speaking role for the New Zealand Association of Mathematics Teachers.

LEONIE ANSTEY

LEVERAGING STUDENT LEARNING PROGRESS, RESOURCES AND PRACTICE

Leonie is passionate about leadership, mathematics, and numeracy education. She has worked extensively with school districts, systems, and individual schools to enable all educators to make progress towards their mathematics education goals. Leonie holds a Master of Education (Research) based on the skills and knowledge for mathematics teacher coaching. She was formerly a principal in Victoria and has worked extensively as a teacher, principal and coach. Leonie's teaching background includes secondary, middle years, and primary education. She has also supported early childhood settings in implementing mathematics and science strategies. In her current role as Education Leader at MAV, she works with teachers and leaders to build knowledge, skills and dispositions in mathematics and numeracy. She leads the MAV team to develop resources to support schools to create excellent teaching and learning programs.

PANEL DISCUSSION: DAVID HOWES, PENNY ADDISON, RACHAEL WHITNEY-SMITH AND MICHAEL MACNEILL

FULL ADDRESSING CONTEMPORARY CHALLENGES IN MATHEMATICS EDUCATION

David Howes is the Deputy Secretary, Schools and Regional Services, Department of Education. He began his career as a teacher in the western suburbs of Melbourne. He has had several senior executive positions in the department. In 2021, David was awarded a PSM for his commitment to deliver educational equity and excellence for Victoria's school students. David holds a Bachelor of Arts (Honours), Diploma of Education, Master of Education and Doctor of Philosophy degrees from the University of Melbourne. David also holds an Executive Master of Public Administration from ANZSOG.

Penny is the Director of the Numeracy, STEM and Digital Learning Branch at the Department of Education, Penny leads a number of teams that have responsibility for the design and delivery of policy and guidance, professional learning and curriculum aligned-resources. Having had experience in a range of teaching, school leadership and system roles over the last 20 years, Penny cites Victorian mathematics education as an area of particular interest. In her current role, she has a key focus on building the capacity of leaders and teachers to ensure that every student leaves school strongly numerate and with the knowledge, skills, capabilities, and dispositions they need to support their chosen pathways and to make decisions in a mathematics-rich world.

Rachael is a Curriculum Specialist, Mathematics at the Australian Curriculum, Assessment and Reporting Authority (ACARA) and is responsible for the Australian Curriculum: Mathematics. Rachael coordinated the development and review of the F–10 Australian Curriculum: Mathematics and led the development of the National Numeracy Learning Progressions Version 3.0. Rachael is currently leading the realignment and updating of the Australian Curriculum: Senior Secondary Mathematics subjects. Rachael has worked as a Mathematics consultant F-12, a professional officer for the Australian Association of Mathematics Teachers (AAMT) and the Executive Officer for the Mathematical Association of Western Australia (MAWA). She has also previously worked as a Secondary Mathematics teacher in NSW and WA and as a head of Department (Mathematics). Rachael has participated in several international and national projects including OECD Education 2030: Mathematics Curriculum Document Analysis Project.

Michael MacNeill is the Curriculum Manager and subject matter expert for Mathematics F-10 and VCE for the VCAA. With a background having studied neuroscience, astrophysics, mechanical and biomedical engineering, he has sought the application of mathematics across disparate areas of investigation and more importantly how the process of learning and applying mathematics can be demystified. Michael has accrued 20 years in the classroom teaching VCE mathematics and physics, as well as mathematics and science at all levels in the secondary context, most of that time leading faculties and whole schools within roles including Head of Science, Head of Numeracy, Head of Mathematics and Head of Senior Mathematics.

KEYNOTES: FRIDAY

PRESENTERS

ASSOCIATE PROFESSOR JODIE MILLER

COMPUTATIONAL THINKING: WHAT'S NEW AND WHERE TO START IN YOUR PRIMARY MATHEMATICS CLASSROOMS

Jodie is the Deputy Head of School at the University of Queensland. Her teaching and educational research explore best practice in mathematics and STEM education. As a primary school teacher working in culturally diverse school communities, Jodie wanted to understand how students develop conceptual understandings of mathematics and what teaching actions could foster success for all students. Being curious about teaching and learning led Jodie to establish a career in classroom research, where she works with teachers and students to enhance the conditions for mathematics learning. Jodie has established a national reputation for her research exploring algebraic thinking, robotics and coding; mathematics learning within families, communities and early years settings; and culturally responsive approaches to supporting Indigenous students' mathematics learning. A commitment to equity and social justice means Jodie's research is primarily focused on supporting those most at risk of marginalisation from the school curriculum.

KATHERIN CARTWRIGHT

'I THINK I ALREADY DO SOME OF THAT?': NOTICING THE NOW AND FRAMING THE FUTURE OF CLASSROOM PEDAGOGY

Katherin is a passionate mathematics educator and is a sessional lecturer and tutor at The University of Sydney teaching pre-service teachers. Katherin's PhD research was on teachers' understanding of mathematical fluency and the characteristics of fluency students' display. She is part of a three-year research project focusing on Embodied Learning in Early Mathematics and Science (ELEMS). Katherin is president of MANSW and secretary of the PreK-8 PAM committee. Katherin loves teaching and enjoys talking about mathematics, curriculum, and pedagogy. Katherin's teaching background is with primary-aged students. She has a interest in researching mathematics approaches for primary teachers that will have a future impact on classroom practice.

PROFESSOR WEE TIONG SEAH

SUPPORTING OUR TEACHERS AND STUDENTS INTO THE FUTURE: VALUING THE VALUE OF VALUES

Wee is Professor in Mathematics Education at The University of Melbourne. He has more than 25 years of experience in initial teacher education and in-service professional development in Australia, across different tertiary institutions and through state, federal and Catholic education departments respectively. His work has been informed by extensive experience in mathematics teaching and pastoral care across educational settings in Singapore and Australia. Wee Tiong has been interested in how aspects of motivation (especially values) can be developed and/or shaped to optimise students' mathematics learning, and to foster / maintain mathematical wellbeing. He has also been examining how cultural variables are associated with – and can thus be harnessed for – effective mathematics teaching and learning.

This keynote presentation is supported by

VICTORIA State Government | Department of Education

ASSOCIATE PROFESSOR JILL BROWN

FULL MATHEMATICAL MODELLING IN THE VICTORIAN CURRICULUM: MATHEMATICS V2.0

Jill is an Associate Professor in mathematics education at Deakin University. Following on from over two decades teaching secondary mathematics, she has now been involved in primary and secondary mathematics teacher education for almost as long. She is interested in mathematical thinking including mathematical modelling and reasoning across all levels of schooling. She has a special interest in using multiple representations, digital technology, and classroom discourse to increase opportunities for deep understanding by all learners. She led a team preparing tasks and advice for the new content descriptions related to mathematical modelling in Victorian Curriculum v2.0: Mathematics.

PANEL: JAMES DANN, DR JULIA HILL, MARK MCLAY, ROHANI MOHAMAD, KERRYN SANDFORD

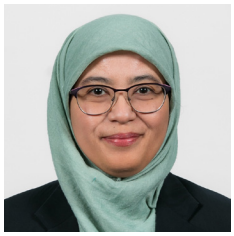
FULL NAVIGATING PRESSING ISSUES IN MATHEMATICS EDUCATION

James is an experienced mathematics teacher who has taught across all levels of the Victorian mathematics secondary school curriculum. James is a leader within an independent school mathematics department and has been a VCAA Assessor of Mathematical Methods for several years. James completed Civil Engineering and Science degrees, with a passion for problem solving in mathematics. As a teacher, this passion spurred the founding of student-led mathematics problem solving clubs at multiple schools and an early-career desire to ensure the enrichment of highly able students. Despite the success of his students in mathematics competitions, James feels that he truly became a teacher when his focus turned to ensuring all students and staff have access to a rich, well-sequenced mathematics curriculum that provides frequent opportunities for students to show their understanding and develop their skills. James believes that this is an essential key to both staff and student wellbeing.

Julia is a Lecturer in Mathematics and Numeracy education at the University of Melbourne and Deakin University. Leveraging her background in teaching and educational psychology, Dr Hill's research bridges the gap between positive psychology and mathematics education. She explores the power of positive emotions, strengths, and flourishing mindsets in both teaching and learning mathematics. Her doctoral research led to the development of a 'mathematical wellbeing' framework, now used internationally to understand ways to cultivate positive feelings and experiences in mathematics. A passionate advocate for translating research into practice, Dr Hill is collaborating with teachers across Victoria to develop strategies to support a flourishing mathematics classroom.

Kerryn is the President of MAV and Principal of Heathmont College. She has taught mathematics and science across Years 7 to 12 since 1997 and undertaken additional study having completed a Masters in Education and a Professional Certificate in Mentoring from The University of Melbourne. She has held positions in school leadership in the North West Region of Melbourne, working as a numeracy coach for a large metropolitan secondary school to assistant principal at another.

Mark works with Country Education Partnerships. He has a passion for mathematics and improving outcomes for rural students. Mark's teaching career began in rural South Australia before heading to the NT. Mark commenced his Principal career at aged 29 as Principal of Adelaide River Primary School just south of Darwin. Mark has always had a passion for mathematics and would regularly take extension maths groups within the schools he has worked. He has also strongly supported staff PD in Mathematics and documentation that supports improved maths teaching and student learning outcomes. Mark is a bit of a maths nerd and as a teacher, he would go way beyond the minimum five hours a week of maths teaching by incorporating the concepts into other lessons.



Rohani is a secondary mathematics teacher at Minaret College. Rohani taught in Malaysia and Ontario, Canada. Growing up in Malaysia, she only knew the existence of high-stake external assessments. However, whilst teaching the Ontario curriculum, she experienced a system without any external assessments.

Rohani studied her PhD at the University of Melbourne under the supervision of Professor Kaye Stacey. One of her research findings highlights how a teacher's belief system shapes assessment practices.

Rohani continues her learning journey through various professional learning platforms such as the MAV and the Victorian Academy. She graduated from the Teaching Excellence Program in 2022.

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MAV MEMBERSHIP

THE MATHEMATICAL ASSOCIATION OF VICTORIA

The Mathematical Association of Victoria (MAV) promotes the importance of mathematics to society. MAV has over 1600 members from all sectors of education including individuals, schools, universities. We provide membership benefits to a growing network of over 16,000 mathematics educators and reach over 60,000 educators, students and parents across metropolitan and regional Victoria via our events each year. MAV is the peak professional body for mathematics educators in Victoria.

MAV works with teachers and school leaders to enhance student outcomes in mathematics and numeracy, better preparing students for their personal, professional and civic lives. Our role is to support educators in developing and delivering curriculum and programs that challenge our students to become the future of mathematical creativity and innovation.

We develop educator skills in implementation of evidence-based and cutting edge teaching and learning approaches. We work directly with students to increase their engagement in mathematics through games days, our Maths Talent Quest, STEM days, mathematics camps, VCE revision support, and other activities.

We are educational experts and leaders, supporting the future of mathematics education from early childhood to Year 12.

To stay up-to-date, subscribe to the MATRIX e-newsletter at www.mav.vic.edu.au.

There is a member category for you:

- Individual member (teachers, academics, student teachers and those with an interest mathematics education)
- Institutional member (primary and secondary schools and early childhood centres)
- Associate member (industry partners or resource providers)

Visit the MAV website for more information, including member benefits, www.mav.vic.edu.au.

HOW I CAN I GET INVOLVED WITH MAV?

MAV depends on its members for success. Extend your professional learning and get involved in MAV's activities:

- present at MAV's annual conference
- join our online community
- write for MAV's journals
- join committees
- develop resources
- pilot mathematics initiatives
- develop a PD event at your school or venue
- judge the MTQ awards, or
- organise a Maths Games Day for your region.

MATHS ACTIVE ACCREDITATION FOR YOUR SCHOOL

MAV's Mathematics Active Schools initiative is a way to recognise and support schools who demonstrate excellence in learning and teaching practices in mathematics.

- Publicise your schools Maths Active Schools certification and demonstrate to your school community that mathematics is enjoyable and highly valued.
- Receive regular activities and information from MAV to promote maths to your school community.
- Be invited to participate in special Maths Active School events.

MATHS ACTIVE ACCREDITATION

SESSION SUMMARY: THURSDAY

THURSDAY 5 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pro

Code	Keynote 9.15am - 10.15am		Session A 11am - 12pm	Session 12.10pm-1.1
1	Drawing inspiration from the world of the child (F-Y4) *Doug Clarke*		Maths for all: inclusive strategies for learners with special needs (F-Y2) *Sumati Randhawa*	Introducing explicit teachi Mathematics Hub (Y3-Y6) *Helen Chick*
2	Enhancing students' reasoning through teacher questioning (Y1-Y6) *Chrissy Monteleone*		Supporting high potential and gifted learners in mathematics (Y1-Y6) *Chrissy Monteleone*	Nurturing algebraic thinki years (F-Y2) *Rebecca Seah, Marj Horne*
3	Growing mathematics teachers and students (Y7-Y10) *Naomi Ingram*	MORNING TEA 10.15am-10.50am Sponsored by anzuk.education	**CANCELLED** Mastering mathematical modelling (F-Y6) *Carmel Delahunty, Judy Gregg*	**FULL** Mathematical mod primary years (F-Y6) *Amy Somers, Renee Ladne*
4	**FULL** Addressing contemporary challenges in mathematics education (F-Y12) *David Howes, Penny Addison, Michael MacNeill, Rachael Whitney-Smith* *Supported by* jacaranda A Wiley Brand		How to purposefully teach critical thinking (F-Y6) *Carmel Menzies*	Planning for mathematica the primary years (F-Y6) *Kate Eastcott*
5	Leveraging student learning progress, resources and practice (F-Y10) *Leonie Anstey*		**CANCELLED** The good bits! Sharing a few of my favourite things (F-Y6) *Stacey Lamb*	Adding 'zing' to your math (F-Y6) *Bernard Kerrins*

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

3 0pm		Session C 2pm-3pm	Session D 3.10pm-4.10pm
ng and the		Our go-to tasks and favourite hands-on materials (Y2-Y6) *Russell McCartney, Christian Terlich*	Topic discussion group: Curriculum – implementation of Victorian Curriculum 2.0 (F-Y2)
ng in the early		Challenging tasks with Foundation students (F-Y2) *Lana Harris, Macalie Vlah, Melissa Paola*	Topic discussion group: Curriculum – implementation of Victorian Curriculum 2.0 (Y3-Y6)
elling in the r	LUNCH 1.10pm - 2pm	**CANCELLED** Engaging students in fractions and assessing with reasoning boards (F-Y6) *Donna McNeight*	**FULL** Topic discussion group: Curriculum – implementation of Victorian Curriculum 2.0 (Y7-Y10)
l connections in		Teaching fractions: multiple interpretations and challenging tasks for middle/upper primary (F-Y6) *Jane Hubbard, Hannah Marino*	**FULL** Topic discussion group: Mathematical modelling (Primary) (F-Y6)
ns sessions		Strengthening numeracy leadership through trust to promote cohesiveness. (F-Y6) *Stephanie Felix*	Topic discussion group: Mathematical modelling (Secondary) (Y7-Y10)

JOIN US FOR NETWORKING DRINKS: 4.10PM-5.10PM
Sponsored by mathspace

THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: THURSDAY (cont.)

THURSDAY 5 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session A 11am - 12pm	Session B 12.10pm-1.10pm	
6	**FULL** The winds of change: five practical tips for numeracy leaders (F-Y6) *Ange Rogers*	Optimising teacher workload and meeting student needs through collaborative PLCs (F-Y6) *Ramya Deepak Kumar, James Dixon*	
7	Problem solving: so much more than worded problems (F-Y6) *Bernadette Long*	**FULL** Rich mathematical tasks - bringing launch, explore, and summarise to life (F-Y6) *Brendan Hodge, Kayla Campbell*	LUNCH 1.10pm - 2p
8	**FULL** AI and the mathematics curriculum (Y5-Y12) *Max Stephens, Rachael Whitney-Smith*	Adapting to change: investigating essential assessment practices with Victorian Curriculum 2.0 (F-Y10) *Jacinta Browning, Jacqueline Clark*	
9	Growth mindset – It's what you do with it that counts (Y3-Y8) *Emma Moore, Ben Allen*	Love languages in a mathematics classroom (Y5-Y10) *Kimberly Silva*	
10	Powerful maths routines for all learners (F-Y12) *Michaela Epstein*	Build Me Up: improving teacher competence with secondary maths (Y5 – Y12) *Danijela Draskovic*	
11	**CANCELLED** Publishing your stories of practice in *Prime Number* and *Vinculum* (F-Y12) *Aylie Davidson, Justine Sakurai*	Card Collector – an interesting problem for investigation (Y9-Y12) *Brian Lannen, Angel Wong*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

	Session C 2pm-3pm	Session D 3.10pm-4.10pm
	Shining the spotlight on Polya's problem solving model (Y3-Y6) *Taryn Volpe, Nikki D'Antonio*	Topic discussion group: Building teaching networks between primary and secondary schools inclusive of transition (Primary) (F-Y6)
	Reasoning: empowering students with mathematical thinking (F-Y6) *Bridgeen Pritchard*	Topic discussion group: Building teaching networks between primary and secondary schools inclusive of transition (Secondary) (Y7-Y12)
om	**FULL** The numeracy wheel: how to embed numeracy across the curriculum (Y7-Y12) *Samantha Horrocks*	Topic discussion group: Building teaching networks between primary and secondary schools inclusive of transition (F-12 schools) (F-12)
	CANCELLED Mentoring students in the Maths Talent Quest competition (F-Y6) *Ruth Evans*	Topic discussion group: Evidence-based instructional models (Primary) (F-Y6)
	Maths on a mat: three generations (F-Y10) *Matt Skoss, Doug Williams, Eleni Pilafas*	Topic discussion group: Evidence-based instructional models (Secondary) (Y7-Y12)
	Top 5 must have manipulatives for middle school (Y5-Y10) *Nadia Abdelal*	Topic discussion group: VCE and VM Teaching, Learning and Assessment 2025 (Foundation) (VCE)

JOIN US FOR NETWORKING DRINKS: 4.10PM-5.10PM
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THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: THURSDAY (cont.)

THURSDAY 5 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session A 11am - 12pm	Session B 12.10pm-1.10pm	
12	Understanding division: a computational thinking approach (Y5-Y10) *Alex de Lacy*	What's the point? Exploring tools for teaching decimals effectively (Y3-Y8) *Carmel Mesiti, Kate Copping*	
13	Why don't they remember it?! (Y3-Y12) *Antje Leigh-Lancaster*	Maths in schools - free online learning for teachers (F-Y10) *Celia Coffa*	LUNCH 1.10pm - 2p
14	Becoming the machine: an experiential guide to algorithmic thinking (F-Y8) *Dean Carmody, James Russo, Jane Hubbard*	Critical connections between language, literacy, mathematics and numeracy (F-Y12) *Dave Tout*	
15	**CANCELLED** Reimagining primary mathematics education (F-Y8) *Di Liddell*	Effective and efficient numeracy pedagogy through connected curriculum (Y5-Y10) *Gloria Yi, Milton Bai*	
16	Untangling 'maths' and 'calculating' (Y5-Y12) *Em Thompson*	Exploring the pedagogical power of vertical whiteboards and random groups (F-Y10) *Jessica Kurzman*	
17	**CANCELLED** Using Microbits and programming using Python in junior mathematics (Y7-Y9) *Rodney Anderson*	Developing students' confidence and capabilities in CAS for pre-VCE students (Y9-Y12) *Sydney Tao*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

Session C 2pm-3pm	Session D 3.10pm-4.10pm
The role of metacognition in mathematical problem solving (Y3-Y8) *Dianne Siemon, Kathryn Arnold*	Topic discussion group: VCE and VM Teaching, Learning and Assessment 2025 (General) (VCE)
Giving a guernsey to geometry: embedding geometry in primary classrooms (F-Y8) *Bernadette Mercieca, Connie Galati*	Topic discussion group: VCE and VM Teaching, Learning and Assessment 2025 (Methods) (VCE)
Fundamental maths instructional strategies: questioning and discussion (F-Y8) *Elizabeth Irwin*	**FULL** Topic discussion group: VCE and VM Teaching, Learning and Assessment 2025 (Specialist) (VCE)
Representing decimal fractions from concrete to the abstract (Y3-Y8) *Kris Westcott*	Topic discussion group: VCE and VM Teaching, Learning and Assessment 2025 (VM) (VCE)
Teaching maths like the language of the universe (Y3-Y10) *Paul Bowyer*	Topic discussion group: Effective assessment practices (F-Y2)
Macro: Fun with Micro:Bits (Y7-Y12) *Peter Fox*	Topic discussion group: Effective assessment practices (Y3-Y6)

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THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: THURSDAY (cont.)

THURSDAY 5 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session A 11am - 12pm	Session B 12.10pm-1.10pm	
18	Connecting teaching to the nature of mathematics to be learned (F-Y10) *Peter Sullivan*	**CANCELLED** Control to collaboration: fostering learning and growth at every level. (F-Y6) *Dale Hetrick, Ashleigh Owens, Molly Ellis*	
19	Some of my favourite maths problems (Y5-Y8) *Doug Clarke*	Questioning techniques to build conceptual understanding of faction concepts (Y5-Y8) *Leonie Anstey*	
20	Real or artificial intelligence - mind blowing puzzles and problems (Y7-Y12) *Peter Fox*	Variables vary – symbolic and animated representations of variation (Y7-Y10) *Alastair Lupton*	LUNCH 1.10pm - 2p
21	**CANCELLED** How's your mathematical diet? (Y7-Y8) *Andrew Lorimer-Derham*	Reviewing the 2023 Mathematical Methods examinations (Y11-Y12) *Allason McNamara, Cathy Devlyn*	
22	**FULL** Ways to jazz up your senior maths classes (Y9-Y12) *Kara Fox, Duane Anderson, Lucas Cruz Rocha*	Mathematics engagement in Years 9 and 10 - support for teachers and students. (Y9-Y12) *Michelle Hackett, Lisa Hogan*	
23	Valuing mathematics through financial literacy: free resources and games (Y7-Y12) *Damian Nicholson*	CAS solutions to 2024 Mathematical Methods Exam 2 (innovative techniques) (Y11-Y12) *Sanjeev Meston*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

Session C 2pm-3pm	Session D 3.10pm-4.10pm
Bring the launch to life! Student engagement through problem solving. (F-Y6) *Maree Croft, Liz Dewar*	**FULL** Topic discussion group: Effective assessment practices (Y7-Y10)
Bringing tasks to life: tips for effective planning in mathematics (F-Y8) *Aylie Davidson*	Topic discussion group: Leadership: mathematics and numeracy (Primary) (F-Y6)
Victorian Curriculum V2.0 Mathematics - an opportunity to expand mathematics culture and understanding (Y7-Y12) *Geoffrey Menon*	Topic discussion group: Leadership: mathematics and numeracy (Secondary) (Y7-Y12)
FULL Mathematics with a problem-solving approach. collaborate, innovate, share, engage! (Y7-Y12) *Karim Noura*	Topic discussion group: Mathematical wellbeing - supporting students and teachers with mathematical anxiety (Primary) (F-Y6)
FULL Writing investigation style Unit 3 and 4 General Mathematics SAC's (Y11 -Y12) *Michelle Galli, Ros Saul*	Topic discussion group: Mathematical wellbeing - supporting students and teachers with mathematical anxiety (Secondary) (Y7-Y12)
FULL How to use DESMOS Activity Builder as a formative assessment tool (Y7-Y12) *Tran Trinh, Narcisa Corcaci*	

JOIN US FOR NETWORKING DRINKS: 4.10PM-5.10PM
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THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: THURSDAY (cont.)

THURSDAY 5 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session A 11am - 12pm	Session B 12.10pm-1.10pm	
24	The craft of mathematics teaching: getting the balance right (Y7-Y10) *Naomi Ingram*	**FULL** Mastering Maths Methods Units 1 and 2: from novice to knowledgeable (Y11-Y12) *Trang Pham*	
25	Implementing pseudocode and algorithms in Python on computer and CAS (Y7-Y12) *Enzo Vozzo*	Using the TI-Nspire notes page for open-ended assessments (Y11-Y12) *James Wing Chung Lam, Miao-Hsuan (Felicity) Hung*	LUNCH 1.10pm - 2p
26	Network decision tools in VCE General Maths (Y11-Y12) *Angel Wong, Brian Lannen*	Probability enriched through simulation in Mathematical Methods (Y11-Y12) *Frank Moya*	
27	Teaching networks in General Mathematics (Y11-Y12) *Jess Mount*	Random walks and complex numbers (Y9-Y12) *Brett Stephenson, Leilani Stephenson*	
28	**FULL** Exploring approaches: replenishing VCE resources and enhancing exam preparation (Y9-Y12) *Peideng Nie*	**CANCELLED** Maximising student potential with Oxford Maths 7–10 (Y7-Y10) *Evan Curnow, Karen De Leon*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

Session C 2pm-3pm
Integrating eigenvalues and eigenvectors into linear transformation education (Python) (Y11-Y12) *Robin Wang*
Transfer goals: interactive maths with TI-Nspire, Rover Innovator (Y7-Y12) *Jayaseelan Durairaj*
Worthwhile CAS use in the 2024 Mathematical Methods Exam 2 (Y9-Y12) *Kevin McMenamin*
Strengthening connections and understanding - linear functions and models (Y7-Y12) *David Leigh-Lancaster*
Pearson Mathematics – powered by Teaching Hub, written for Victorian curriculum (Y7-Y10) *Lindy Sharkey, Julian Lumb*

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THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: FRIDAY

FRIDAY 6 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pro

Code	Keynote 9.15am - 10.15am		Session E 11am - 12pm	Session 12.10pm-1.1
1	'I think I already do some of that?': noticing the now and framing the future of classroom pedagogy (F-Y2) *Katherin Cartwright*		Big Ideas and Victorian Curriculum: Building a scope and sequence (F-6) *Renee Ladner*	Rich maths through pictur (F-Y6) *Marissa Cashmore*
2	Computational thinking: what's new and where to start in your primary mathematics classrooms (Y1-Y6) *Jodie Miller*		**CANCELLED** How MOI growth points can guide your teaching effectively (F-Y4) *Donna McNeight*	Dyscalculia and SLDs - bri based pedagogy into daily (F-Y6) *Esther White*
3	**FULL** Navigating pressing issues in mathematics education (Y6-Y12) *James Dann, Julia Hill, Mark McLay, Rohani Mohamad, Kerryn Sandford*	**MORNING TEA** 10.15am-10.50am	I'd like to do more of that, but what does it look like in practice? (F-Y2) *Katherin Cartwright*	Questioning and dialogue mathematics curriculum? (F-Y5) *Leonie Anstey*
4	**FULL** Mathematical modelling in the Victorian Curriculum: Mathematics v2.0 (F-Y10) *Jill Brown*		Engaging intervention (F-Y6) *Amy Somers*	**CANCELLED** Mathema of learning and wellbeing (Y3-Y6) *Lauren Field*
5	Supporting our teachers and students into the future: valuing the value of values (F-Y12) *Wee Tiong Seah* Supported by VICTORIA State Government | Department of Education		LI + SC = Clarity (F-Y6) *Paul Staniscia*	A shared vision and under leading mathematics (F-Y6) *Vanessa Grossit, Molly-Rose Clifton-Willian*

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

F 0pm		Session G 2pm-3pm	Session H 3.10pm-4.10pm
e story books		Differentiation through a focus on knowledge and skills (F-Y6) *Zahra Harvey*	Embed CAS techniques including Python for Pseudocode and computational mathematics (Y7 to Y12) *Sanjeev Meston*
inging evidence y practice		**FULL** Explicit teaching and rich problems: how to marry the two! (Y3-Y6) *Catherine Epstein-Rodgers, Antje Leigh-Lancaster*	Hands on! embedding the proficiencies in rich investigations (Y3-Y6) *Catherine Epstein-Rodgers*
utilising VC2.0	**LUNCH** **1.10pm - 2pm**	Identifying quality online resources (F-Y6) *Cassandra Lowry*	Picture books - a springboard for effective maths teaching (F-Y6) *Sheila Griffin, Di Liddell*
tics as a source		Mindset matters: creating productive dispositions for numeracy success. (F-Y6) *Monica Waterworth, Elise Copsey*	Explicit teaching within the guided inquiry model (F-Y6) *Kris Westcott*
standing for nson		Leading change in mathematics (F-Y6) *Jayde Williams*	The Big Ideas in Number update (F-Y8) *Dianne Siemon*

SESSION SUMMARY: FRIDAY (cont.)

FRIDAY 6 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session E 11am - 12pm	Session F 12.10pm-1.10pm	
6	Five types of whole-class maths games to engage students (F-Y6) *James Russo, Toby Russo*	**CANCELLED** Empowering additive thinkers: debunking the subtraction myth (F-Y6) *Cathy Azzopardi, Laura de Kretser*	
7	Illustrations of impact: how consolidating tasks enhance student learning and engagement (F-Y6) *Michael Cini, Alana Bandholz*	A whole school fluency program - WHY, WHAT and HOW ((F-Y6) *Zahra Harvey, Adam Wight*	LUNCH 1.10pm - 2p
8	An exploration of teaching mathematics through problem-solving (Y3-Y6) *Donna Guise*	Collaborate to elevate: anticipating student strategies (F-Y6) *Erin Whitbread, Gabby Vandekolk, Elise Wise*	
9	Embedding wellbeing in the maths classroom: practical strategies (F-Y12) *Justine Sakurai, Julia Hill*	What does it mean to 'belong' in the mathematics classroom? (F-Y12) *Kerryn Sandford*	
10	**FULL** Building thinking classrooms - what I wish I knew earlier. (Y5-Y12) *Lorna McClory, Penne Grant*	**FULL** Support students with mathematics learning difficulties (MLD) (Y3-Y8) *Jennifer Sze*	
11	**FULL** Unpacking the Victorian Curriculum Mathematics 2.0 for successful implementation (F-Y10) *Crystal Afitu, Zahara Forte, Lee Gianfriddo*	Tweaking tasks to impact engagement and learning (Y5-Y10) *Yvonne Reilly*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

	Session G 2pm-3pm	Session H 3.10pm-4.10pm
m	Reinvigorating best practice mathematics teaching (F-Y6) *Adele Gregson, Beth Dean, Melinda Ruscitti, Kate Buzaglo*	Summing it up! Effective strategies for summarising lessons (Y3-Y6) *Ashleigh Donoghue, Hung Vo-Tran*
	Unlocking student potential: informal assessment in the primary mathematics classroom (F-Y6) *Anita Green*	**CANCELLED** Working mathematically with APSMO: communication and collaboration (Y3-Y6) *Yvette Semlier*
	CANCELLED I do, we do, you do, then forget (Y3-Y6) *Heather Ernst*	The affordances and constraints of digital and non-digital mathematical games (F-Y6) *Toby Russo, James Russo*
	Mathematical wellbeing through intentional fun (Y3-Y10) *Andrew Lorimer-Derham*	SMART (Specific, Measurable, Achievable, Relevant and Timely) goals in mathematics = students' success (F-Y12) *Jennifer Sze*
	A cultural shift for supporting Aboriginal Torres and Strait Islander mathematics learners (F-Y12) *Jennifer Bowden, Kerryn Sandford*	From managing to leading: a mathematics leadership continuum (F-Y10) *Kate Copping*
	Approaches to planning, teaching and assessment Mathematics V2.0: stories from Foundation to Year 7 (F-Y7) *Sharyn Livy*	Modelling using digital technologies in Years 5 to 10 (Y5-Y10) *Sebastian Sardina, Max Stephens*

SESSION SUMMARY: FRIDAY (cont.)

FRIDAY 6 DECEMBER 2024

SUB-THEMES

Curriculum: Providing quality resources and professional learning based on the revised Victorian 2.0 curriculum	**Pedagogy:** Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students and improving learning	**Wellbeing:** Promoting student and teacher wellbeing in mathematics and professional growth for teachers through support and development	**Le** lea an pr

Code	Session E 11am - 12pm	Session F 12.10pm-1.10pm	
12	Facilitating students' embracing of values in the mathematics classroom: the JEDI approach (F-Y12) *Wee Tiong Seah*	Shifting student mindset toward celebrating the process, not the answer (Y5-Y10) *Mark Gleeson*	
13	Boosting engagement and social skills through cooperative learning (Y5-Y8) *Joanna Tutos*	New curriculum, new opportunities (F-Y8) *Michael Minas*	**LUNCH** **1.10pm - 2p**
14	Learning the language of maths: unlocking truths though word origins (Y5-Y10) *Emily Peterson*	**FULL** The problem with worded problems is the words! (F-Y8) *Antje Leigh-Lancaster, Kris Westcott*	
15	**FULL** AI and lesson planning: help or hindrance? (Y3-Y12) *Scott Cameron, Carmel Mesiti*	Empowering educators with GenAI: future proofing student learning (Y5-Y12) *Luke Clift*	
16	Inquiry in mathematics - what is it really? (F-Y10) *Kristen Tripet*	**CANCELLED** Exploring creative geometry through drawing with MATHOMAT (Y5-Y8) *John Lawton, Michelle Du Toit, Christopher Tisdell*	
17	Mathematical modelling in the new curriculum (Y5-Y8) *Jill Brown*	Planning for sequences of challenging tasks using the HITS (F-Y8) *Scott Hamilton, Kristyn Cram*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

	Session G 2pm-3pm	Session H 3.10pm-4.10pm
	FULL Having some fun with numeracy and maths (Y3-Y12) *Dave Tout*	Linear algebra – building understanding (Y7-Y10) *Mark Ljubic, Keegan Blows*
	Teaching graphs and networks at junior secondary level (Y7-Y10) *Robert Money*	**CANCELLED** Overcoming difficulties with teaching angle as a spatial structuring tool (Y5-Y8) *John Lawton*
m	The role of authentic data in maths education (Y3 to Y10) *Allan Dougan*	Mastering geometry: overcoming misconceptions with effective teaching and learning (F-Y8) *Michael Nelson*
	Algebra through geometry (Y5-Y8) *Doug Williams*	Cracking the pseudocode: teaching algorithms from a student perspective (Y5-Y12) *Lianna Beeching, Amanda Fan*
	How to use questions to unlock creativity (F-Y12) *Michaela Epstein*	Where is the explicit teaching in Launch, Explore, Summarise? (F-Y8) *Jessica Kurzman, Renee Ladner*
	Empowering teachers in the implementation of Victorian Curriculum 2.0 (F-Y8) *James Dixon, Ramya Deepak Kumar*	Developing Mathematics Leaders (F-Y6) *Peter Burrows*

SESSION SUMMARY: FRIDAY (cont.)

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Code	Session E 11am - 12pm	Session F 12.10pm-1.10pm	
18	**FULL** Puzzles, problems and tricks of the trade to engage students (Y7-Y10) *Mike Ristovsky, Taylor Pervan*	A deeper look at teacher questioning (F-Y8) *Ellen Corovic*	
19	All high-ceiling, all knowing: how to avoid 'Mathematics 2.0' becoming '2-point-Oh-No!' (Y5-Y10) *David Innes*	**CANCELLED** The Victorian Coding Challenge - where maths and coding shine (Y5-Y10) *Danijela Draskovic, Max Stephens*	
20	Fun in the digital space with Geogebra (Y5-Y8) *Marj Horne, Rebecca Seah*	Engaging, hands-on card activity or online app – Numero! (F-Y10) *Julie Richards*	**LUNCH** **1.10pm - 2p**
21	Killer General Maths VCE questions by MaffsGuru's and Nelson VicMaths (Y11-Y12) *Darren Smyth, Robert Yen*	**FULL** Toolkit for teachers new to Mathematical Methods Units 1-4 (Y11-Y12) *Vincent Lam*	
22	**FULL** Sequences, pseudocode, and programming using TI-Nspire (Y11-Y12) *Raymond Rozen, Shane Dempsey, James Mott*	**FULL** TI-Nspire hints, shortcuts and enhancements TI-Nspire hints, shortcuts and enhancements (Y9-Y12) *Neale Woods*	
23	Cultivating flow: enhancing engagement and learning in secondary school mathematics (Y7-Y10) *Joel Pinto, James Dann*	**FULL** Effective classroom teaching of secondary school mathematics (Y7-Y12) *Peter Collins*	

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	Session G 2pm-3pm	Session H 3.10pm-4.10pm
	Aligning success criteria for mathematical proficiency: questions to be considered (F-Y10) *Eamon Light*	Provoking mathematical reasoning: a tale of two teachers (Y5-Y10) *Matt Skoss, Paul Howard*
	CANCELLED Co-developing the understanding of the equal sign and formal equations (Y3-Y8) *Jiqing Sun*	The proficiencies are key (Y5-Y12) *Em Thompson*
m	Building thinking classrooms in a senior class (Y9-Y12) *Lorna McClory*	This way and that, transformation, functions, and inverses (Y9-Y12) *Shelley Pendlebury, Jotishma Singh*
	Taylor Series from symmetry of quadratic function using T-Nspire CAS (Y9-Y12) *Liu Wenting*	Developing competency-based assessment rubrics in the middle years (Y7-Y10) *Mark Grasso, Matthew Vicendese*
	Advancements in scientific calculators - 8200 + emulator (Y7-Y10) *Alastair Lupton*	General Mathematics Exams: using the CAS calculator efficiently and effectively (Y9-Y12) *Kevin McMenamin*
	Deathrays and deductions: how the ancient Greeks shaped mathematics (Y7-Y10) *Jo Clyne, Tom Harris*	Mixing it up while keeping things in proportion (Y7-Y12) *David Leigh-Lancaster*

SESSION SUMMARY: FRIDAY (cont.)

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Code	Session E 11am - 12pm	Session F 12.10pm-1.10pm	
24	Learnings from an early implementation of the new Vic 2.0 mathematics curriculum (Y7-Y10) *Cory Duker, Daniel O'Kane*	Lesson activities for 9-10 algorithmic thinking referencing Mathematics 2.0 (Y9-Y10) *Georgia Gouros*	
25	STEM Activities in astronomy (Y9-Y12) *Stephen Broderick*	Getting into the swing of things with trigonometry (Y9-Y12) *Shelley Pendlebury, Peter Fox*	**LUNCH** **1.10pm - 2p**
26	Enhancing middle years numeracy: a strength-based pedagogy (Y7-Y10) *Milton Bai, Gloria Yi*	Naïve bayes – from spam detection to sorting hat (Y9-Y12) *Echo Gu*	
27	Cultivating financial literacy in maths with Innovative technology (Y9-Y12) *Jason Jin*	How to help students visualise transformations using technology (Y9-Y12) *Narcisa Corcaci, Tran Trinh*	
28	The notes application, widgets and more! (Y11-Y12) *Chris Ireson, Len Bedier*	**FULL** Engaging students through maths games: building teamwork and communication skills (Y7-Y10) *Vito Boglietti*	

adership: Successful examples of ading effective collaboration, support, d networking for teachers across the ofession	**Technology:** Supporting mathematics teaching and learning through innovative and emerging technologies	Multiple sub-themes

	Session G 2pm-3pm	Session H 3.10pm-4.10pm
	Empowering teachers with innovative practices for the revised Victorian curriculum (Y7-Y10) *Katharine Lin*	Mathematical models that measure our world (Y7-Y12) *Kaye Stacey*
m	The TI-Nspire geometry application (Y7-Y10) *Neale Woods*	Real trigonometry using real-time real-world data (Y9-Y12) *Enzo Vozzo*
	Pedagogy in action: complex numbers with TI-Nspire and visible learning (Y11-Y12) *Greta Gomes, James Mott*	Our journey through improving our teaching of mathematics (Y7-Y10) *Timothy Ross, Jaswinder Kaur, Emily Beale*
	A blended mathematics and coding curriculum - a case study (Y7-Y10) *Toan Huynh, Lindsay Hill*	Building Nspirations (Y9-Y12) *Peter Fox*
	Calculus without algebra using primary school arithmetic and Excel (Y11-Y12) *Enzo Vozzo*	**FULL** Designing mathematical investigations for upper secondary (Y9-Y12) *James Mott*

SESSION DETAILS

THURSDAY 5 DECEMBER 2024

KEYNOTES: Thursday, 9.15am-10.15am

KT01 DRAWING INSPIRATION FROM THE WORLD OF THE CHILD (F-4)

Subthemes: Curriculum, Pedagogy, Wellbeing

Doug Clarke, ACU
(F to Y4)

As we seek to make mathematics relevant, and enjoyable to both teach and to learn, a great place to start is the interests of our children. What is it that really interests our learners? And how might we take those interests and build worthwhile and enjoyable experiences from those. Doug will share many examples that he has used in recent years, drawing upon the interests of primary students and his six grandchildren (four of whom are in early years or junior primary). And we'll have some fun too!

Key takeaways:

Hopefully, some inspiration and examples of how participants might use the interests of their own learners as a springboard for mathematics learning.

KT02 ENHANCING STUDENTS' REASONING THROUGH TEACHER QUESTIONING (F - Y6)

Subtheme: Pedagogy

Chrissy Monteleone, ACU
(F to Year 6)

Critical mathematical thinking (CMT) plays a pivotal role in nurturing students' mathematical reasoning abilities. To facilitate meaningful mathematical discourse during learning, teachers can use specific question types tailored to students. These encompass probing, factual, and guiding questions. In this presentation, Chrissy will offer practical strategies for teachers to foster CMT among students. This involves utilising open-ended questions backed by research and evidence, strategically aimed at enhancing students' reasoning skills.

Key takeaways:

Teachers will gain valuable insights into incorporating high-quality questioning techniques informed by research to enhance students' reasoning abilities.

KT03 GROWING MATHEMATICS TEACHERS AND STUDENTS

Subthemes: Pedagogy, Wellbeing

Naomi Ingram, University of Otago
(Year 7 to Year 10)

Naomi, as an experienced-informed and research-informed professional, will describe her own teaching journey in school and university classrooms. She will share her insights into mathematics education, and her discomfort about how teachers are sometimes portrayed in the media. Naomi will highlight the importance of teachers having a positive and robust relationship with mathematics and will suggest ways teachers and students can build a strong sense of the beauty, value, and importance of the subject.

Key takeaways:

Building confidence and expertise in teaching mathematics.

FULL KT04 ADDRESSING CONTEMPORARY CHALLENGES IN MATHEMATICS EDUCATION

Subthemes: Curriculum, Pedagogy, Wellbeing, Leadership

David Howes, Department of Education (Victoria), Penny Addison, Department of Education (Victoria), Michael MacNeill, VCAA, Rachael Whitney-Smith, ACARA
(F to Year 12)

In 2024, mathematics education faces a unique global and local challenges that demand innovative solutions. This panel presentation will delve into these pressing issues, offering a comprehensive exploration of current mathematics curriculums and the resources available to support their implementation.

Our discussion will extend to the evolving needs of the mathematics workforce sector, addressing both current demands and future projections. Recognising the critical role of educators, the panel will share examples of initiatives designed to enhance teacher wellbeing, foster collaboration, and cultivate leadership within the profession.

We aim to provide valuable insights and practical recommendations that will empower educators and stakeholders to navigate the complexities of mathematics education in today's dynamic environment.

KEYNOTES: Thursday, 9.15am-10.15am (cont.)

Key takeaways:

1. Insights into the latest innovative approaches to addressing the unique global and local challenges facing mathematics education in 2024.

2. Learn about effective initiatives designed to enhance teacher well-being, encourage collaboration, and develop leadership skills, equipping them with practical strategies to support educators in their professional growth.

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KT05 LEVERAGING STUDENT LEARNING PROGRESS, RESOURCES AND PRACTICE – (F – Y10)

Subthemes: Curriculum, Pedagogy, Leadership

Leonie Anstey, The Mathematical Association of Victoria (F to Year 12)

In a learning landscape where there are many resources, options, and opportunities for mathematics lessons, teachers can feel overwhelmed and may lack direction. In this keynote, Leonie will highlight selected excellent resources and offer provocations for your practice. She will share her knowledge of how resources develop a culture of developing and enhancing expertise for teaching and learning in your school or classroom. You will leave with a clear understanding potential decisions and perspectives that can be used to create a balanced and cohesive mathematics program.

Key takeaways:

It is the learning that student do that matters.
How does the resource empower a culture of trust and respect for learning and teaching?

SESSION A: Thursday, 11am-12pm

A01 MATHS FOR ALL: INCLUSIVE STRATEGIES FOR LEARNERS WITH SPECIAL NEEDS

Subtheme: Technology

Sumati Randhawa, Bulleen Heights School
(F to Year 2)

In this session, teachers will be shown various strategies to personalise learning for students with special educational needs. Teachers will be learning strategies on how to incorporate assistive technology to enhance student engagement and comprehension in mathematics such as using the app Proloquo2go. Additionally, using tools like video modelling provides visual and auditory reinforcement of routines, making abstract concepts more concrete. Teachers will learn on using visual supports like Colourful Semantics which can help students understand mathematical language with more ease, including those who are non-verbal. Teachers will also understand the importance of a collaborative approach, involving speech therapists, educational professionals, and parents to create a supportive and responsive learning environment. Participants will walk away from this session with a practical understanding of the supports required to effectively scaffold the learning of students with special needs in numeracy.

Key takeaways:

1. Making learning more personalised for students with diverse learning needs

2. Using technology and visuals as a support in mathematics, e.g. video modelling, Colourful Semantics and social stories

3. Learning how to implement practical and real-life lessons in the community

THE PRESENTER WILL RECORD THIS SESSION.

A02 SUPPORTING HIGH POTENTIAL AND GIFTED LEARNERS IN MATHEMATICS

Subtheme: Pedagogy

Chrissy Monteleone, Australian Catholic University
(Year 1 to Year 6)

This workshop explores the definition and identification of high potential and gifted mathematicians, emphasising the pedagogical strategies that best support their development. Key instructional practices include differentiated instruction, the status of ability grouping, challenging tasks, and task modification. The implications of these practices for educational systems and policy are also shared.

CANCELLED A03 MASTERING MATHEMATICAL MODELLING

Subtheme: Curriculum

Carmel Delahunty, Yeshivah-Beth Rivkah Colleges, Judy Gregg, Mathematics Contract Consutlant
(F to Year 6)

Although included in curricula for some time, mathematical modelling is now in the descriptions of the Australian Curriculum 9.0/Victorian Curriculum 2.0, from Level 1. This session looks at what mathematical modelling is and isn't and explores how to go about planning for mathematical modelling with reference to current successful examples of this process. Participants will have the opportunity to share their experiences with the mathematical modelling process and add to their knowledge and ideas.

Key takeaways:

1. What mathematical modelling is.

2. How to plan for mathematical modelling.

3. Examples of the mathematical modelling process in context.

A04 HOW TO PURPOSEFULLY TEACH CRITICAL THINKING

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Carmel Menzies, Firefly Education
(F to Year 6)

Critical thinking is a crucial part of teaching and learning, especially when it comes to mathematics. It is a complex mental journey that requires students to transform information into knowledge and apply this knowledge to a variety of real-world contexts. Participants of this presentation will walk away with a handful of practical ways to embed critical thinking in their maths lessons. In this presentation, we'll use the comprehensive Maths Trek program resources to highlight effective strategies to purposefully teach and improve students' critical thinking skills. Maths Trek is a new resource which is aligned to the newest Victorian Curriculum and focuses on developing students' problem-solving, reasoning and critical thinking skills through explicit teaching and real-world application in investigations.

SESSION A: Thursday, 11am-12pm (cont.)

Key takeaways:

1. Learn how and why students should be carefully guided through their critical thinking journey.

2. Identify different explicit and implicit teaching strategies to help develop students' critical thinking skills.

3. Apply the strategies in your classroom immediately, either by adopting the principles discussed to your own maths resources, or by using the scaffolded critical thinking resources and activities from the Maths Trek program.

CANCELLED A05 THE GOOD BITS! SHARING A FEW OF MY FAVOURITE THINGS

Subtheme: Pedagogy

Stacey Lamb, St Bernard's Primary School
(F to Year 6)

Choice of lesson and choice of task is paramount. Challenge and engagement set the scene for purposeful learning. During this hands-on session, experience a range of lesson starters, games, challenging tasks and mathematical modelling tasks.

Key takeaways:

1. Research based lesson starter ideas, games and engaging lessons.

FULL A06 THE WINDS OF CHANGE: FIVE PRACTICAL TIPS FOR NUMERACY LEADERS.

Subtheme: Leadership

Ange Rogers, Numeracy Teachers Academy
(F to Year 6)

You just have to read the daily newspaper to realise that there is change afoot in the world of education. Evidence-informed decisions are now, more than ever, critical to ensure we are leading our schools effectively. As a Numeracy Leader, principals and colleagues often look for guidance, support and informed advice on the best course of action for the school to follow. Yet sometimes we may not be sure what the 'best steps' are, or the steps suggested by 'higher powers' may not align with our personal beliefs about quality instruction. In this session Ange shares five practical tips to support Numeracy Leaders to remain sane, confident and clear in their vision for their school. Participants will walk away from this session with an understanding of important research to be aware of as we make school-based decisions about our numeracy instruction.

Key takeaways:

1. Understanding of the current 'state of play' in numeracy education.

2. Understanding of the importance of making research-informed decisions.

3. Five practical tips for leading numeracy with confidence.

A07 PROBLEM SOLVING: SO MUCH MORE THAN WORDED PROBLEMS

Subtheme: Pedagogy

Bernadette Long, Glowrey Catholic Primary School
(F to Year 6)

As teachers we are constantly being told to give students lots of experiences with problem solving. Teachers try so hard to teach students how to problem solve. However, many of the examples we are being shown are based around worded problems. There are many other ways for students to develop problem solving skills. In this presentation I will provide a variety of examples of ways class teachers from F to 6 can encourage students to think deeply, work collaboratively and reason their way to mathematical solutions while promoting maths as a fun subject.

Key takeaways:

1. Mathematics classrooms should be places where students are required to think deeply.

2. It is important to use a variety of activities to develop students that are able to problem solve.

3. Problem solving is an essential life skill and maths is a wonderful vehicle to encourage these skills.

FULL A08 AI AND THE MATHEMATICS CURRICULUM (YEARS 5-12)

Subtheme: Curriculum

Max Stephens, Faculty of Education, The University of Melbourne, Rachael Whitney-Smith, ACARA
(Year 5 to Year 12)

The session will identify areas of intersection between AI and mathematics and will help teachers of Mathematics understand how AI works and show that what students learn in mathematics underpins AI and provides a foundation for appreciating the strengths and limitations of AI. Facial recognition, robotics, and autonomous vehicles provide new contexts to apply mathematical content. The way in which we determine position and location and navigate spaces using GPS and other geolocation processes (such as those used by drones and automated delivery services), and new ways of creating, generating, representing, augmenting, and distorting images, require sound geometric skills and spatial reasoning to work within and move between different dimensions. Students also apply mathematics when making ethical decisions concerning data, recognising intentional and accidental errors or distortions, and to think critically about the output of AI systems, especially predictive algorithms.

Key takeaways: 1. Helping teachers of mathematics in both the primary and secondary years appreciate the connections between AI and the mathematics students are learning.

2. Identifying key areas where AI and mathematics interconnect.

3. Showing how mathematics is essential for fostering and understanding and critical disposition towards AI.

A09 GROWTH MINDSET – IT'S WHAT YOU DO WITH IT THAT COUNTS

Subtheme: Wellbeing

Emma Moore, The Victorian Academy of Teaching and Leadership, Ben Allen, The Victorian Academy of Teaching and Leadership
(Year 3 to Year 8)

In this session, we will define and describe a growth mindset - what it is and what it isn't -using classroom examples. Two areas in research where a growth mindset is important are motivation and maths anxiety. In this session, we will look at a mathematical activity from a student's perspective and use resources developed by the Academy of Teaching and Leadership and ACER to support students' emotional regulation and the impact it can have on learning.

Key takeaways:

1. Re-framed ideas regarding a growth mindset.

2. Resources to support emotional regulation (in mathematics but easily adapted to all areas).

A10 POWERFUL MATHS ROUTINES FOR ALL LEARNERS

Subtheme: Pedagogy

Michaela Epstein, Maths Teacher Circles
(F to Year 12)

Wish you could get your students thinking deeply about maths in every lesson? In this session, you'll learn about two powerful maths routines that are specially designed to unlock new ideas, insights, and reasoning about mathematics. Both routines are suitable for P-12 classrooms and can be easily adapted to be used across curriculum topics. You'll also explore strategies and techniques for facilitating routines that you can then use to help your students articulate their thinking, form connections, and learn more maths than would be possible if working alone from a textbook or worksheet.

Key takeaways:

You'll learn about;

1. A different view on 'routines' in the maths classroom.

2. Two powerful routines you can use with all students and across topics.

3. Five strategies you can use to get the most out of any maths routine.

CANCELLED A11 PUBLISHING YOUR STORIES OF PRACTICE IN PRIME NUMBER AND VINCULUM

Subtheme: Pedagogy

Aylie Davidson, Deakin University, Justine Sakurai, Deakin University/The University of Melbourne
(F to Year 12)

Have you considered publishing your stories of practice? Aylie and Justine, the Editors of MAV's *Prime Number*

(Primary) and *Vinculum* (Secondary) respectively, will guide you through the process of writing for publication. This session aims to demystify the publication process, offering practical insights and tips for teachers and leaders who are keen to contribute to the mathematics educational discourse. Whether you're a teacher with innovative ideas, a leader with strategies for whole-school improvement in mathematics, or a mathematics educator who works more broadly across schools, this workshop will provide a supportive environment to explore how to craft and submit your narrative effectively. Discover how your everyday classroom experiences can contribute to the professional growth of your peers and inspire broader educational communities. Don't miss this opportunity to discuss your ideas with the editors and take the first step towards sharing your important work with a wider audience. No experience necessary!

Key takeaways:

1. Familiarise yourself with MAV's teacher journals.

2. Understand the publication process.

3. Be confident to know how to get started to share your stories of practice.

Remember: Have in mind a recent 'story of practice' you might consider sharing. It could be a success story, a task you created, something you tried in class, translating research into practice or anything else!

A12 UNDERSTANDING DIVISION: A COMPUTATIONAL THINKING APPROACH

Subtheme: Curriculum

Alex de Lacy, Oxford University Press
(Year 5 to Year 10)

Computational thinking is integrated into the Victorian Curriculum Mathematics V2.0. A useful starting point for students and teachers is to consider algorithms that are already familiar. In this session, we will look at the long division algorithm and use a computational thinking approach to understand how the algorithm works, and what it tells us about numbers and divisibility. This includes answers to the following questions:

- Why do we work from left-to-right (instead of right-to-left as in other addition, subtraction and multiplication)?
- What does the long division algorithm actually do?
- How can we link the long division algorithm to our understanding of divisibility?
- What can we learn about algorithms in general from this process?

Key takeaways:

1. A deep understanding of how the long division algorithm works.

2. An approach to analyse and understand mathematical algorithms.

A13 WHY DON'T THEY REMEMBER IT?!

Subtheme: Pedagogy

Antje Leigh-Lancaster, Leigh-Lancaster Consulting
(Year 3 to Year 12)

No doubt many of us have had moments where we're surprised by what our students haven't remembered.

In this workshop, we will begin by exploring some practical classroom strategies and approaches that research has shown to be effective in facilitating learning, retention and recall, for example:

- explaining an idea, concept or solution to someone else.
- benefit of deliberately making an error and then correcting it.
- using faded worked examples.
- developing multiple 'entry and exit' points.
- spaced and interleaved practice.

You will have the opportunity to work in small groups to see how these strategies and approaches could be incorporated in lessons and topics.

By the end of this session, you will leave with a range of practical strategies, a copy of the presentation and links to some related resources.

Key takeaways:

1. An understanding of some effective teaching and learning strategies and approaches.

2. Practical experience with applying the strategies .

3. Links to related resources.

A14 BECOMING THE MACHINE: AN EXPERIENTIAL GUIDE TO ALGORITHMIC THINKING

Subtheme: Pedagogy

Dean Carmody, Catherine McAuley College, James Russo, Monash University, Jane Hubbard, Monash University
(F to Year 8)

Teachers often view digital and non-digital tools as alternative means of supporting mathematics learning. However, as a teacher, you may have wondered whether the two can in fact be complementary; whether sensory and visceral non-digital experiences can help to give meaning to what might otherwise be alien and disconnected concepts associated with digital technology. In this workshop, we explore how algorithmic thinking can be introduced through exploring seemingly simply designed analogue function machines. Through allowing students to physically 'perform computation', such experiences can facilitate the development of a deeper appreciation and fascination for how digital systems work.

Key takeaways:

1. A tactile, tangible experience of executing an algorithm inside a 'human computer'.

2. Access to templates and designs that will allow teachers to recreate these experiences in their own classrooms.

CANCELLED A15 REIMAGINING PRIMARY MATHEMATICS EDUCATION

Subtheme: Pedagogy

Di Liddell, The Mathematical Association of Victoria
(F to Year 8)

In this professional learning session, primary mathematics educators are invited to delve deeply into their foundational beliefs about how they perceive children as learners. By examining the reciprocal relationship between these beliefs and the pedagogical practices they draw upon in their classroom practice, participants will uncover rich opportunities for fostering mathematical growth and understanding in their students. Through reflective dialogue and collaborative exploration, educators will uncover how they can reimagine mathematics education by reconceptualising how they perceive children as learners of mathematics. Join us on this journey of discovery and empowerment as we unlock the boundless potential of primary mathematics education.

Key takeaways:

1. Teachers will uncover their beliefs about children as learners.

2. Teachers will delve into the reciprocity of beliefs and practice.

3. Teachers will reflect on how they can reimage mathematics education for all learners.

A16 UNTANGLING 'MATHS' AND 'CALCULATING'

Subtheme: Curriculum

Em Thompson, Monash University, School of Mathematics
(Year 5 to Year 12)

For many people, 'maths' is synonymous with 'calculating'. The facts and procedures taught in school have been known for hundreds and thousands of years, making it reasonable to believe that maths is 'done'; that we know all there is to know, and the answer will always be in the back of the textbook (or just a Google away!). But maths is alive and well, with new facts and procedures being proven every day. In this talk, I will give a peek into some of the extremely accessible aspects of my research in knot theory, including some potential activities to take back to the classroom. The emphasis will be on maths that might not feel like maths, highlighting a puzzly, creative and not-so-calculation-heavy side of maths that many people never get to meet.

Key takeaways:

1. A basic introduction to the mathematics of knots.

2. Potential activities to take back to the classroom.

3. A fresh perspective on what makes something 'maths'.

SESSION A: Thursday, 11am-12pm (cont.)

CANCELLED A17 USING MICROBITS AND PROGRAMMING USING PYTHON IN JUNIOR MATHEMATICS

Subtheme: Technology

Rodney Anderson, Moreton Bay College
(Year 7 to Year 9)

Who thought that four lines of Python programming using a calculator connected to a Microbit you could determine the angle of elevation (Who needs clinometers?)? During this session we will program using Python and also use calculators attached to a Microbit to investigate Mathematical concepts. Explore a range of amazing activities afforded by the Microbit. No prior coding or Micro:bit experience required or assumed.

Key takeaways:

1. Develop skills for algorithmic and computational thinking and coding.

2. Provide opportunities for teachers to use STEM technology in their classrooms.

3. Student engagement in programming to enhance their understanding of Mathematical concepts.

A18 CONNECTING TEACHING TO THE NATURE OF MATHEMATICS TO BE LEARNED

Subtheme: Pedagogy

Peter Sullivan, Monash University
(F to Year 10)

Planning, teaching, learning and assessment are ideally informed by the nature of mathematics in which explicit emphasis is on connections between ideas, flexible thinking, application of mathematics to practical contexts, and ways that problem solving and reasoning connect to understanding and fluency. This session will illustrate the characteristics of such teaching and will contrast this with approaches that reduce mathematics to routines and rules to be learned by rote.

Key takeaways:

1. Examples of tasks and lessons that foster mathematical thinking.

2. Insight into how this approach can enhance student engagement, agency and equity.

A19 SOME OF MY FAVOURITE MATHS PROBLEMS (YEARS 5 TO 8)

Subthemes: Curriculum, Pedagogy, Wellbeing

Doug Clarke, Australian Catholic University
(Year 5 to Year 8)

In this workshop, we'll actively work through some maths problems which have the potential to build important connections - connections between the mathematics in the classroom and that of the world outside, and connections within mathematics also. Content addressed will be drawn from geometry, statistics, percentages, and measurement. Participants will leave with several activities ready to use in the following weeks with their students. And we'll have some fun too!

A20 REAL OR ARTIFICIAL INTELLIGENCE - MIND BLOWING PUZZLES AND PROBLEMS

Subtheme: Curriculum

Peter Fox, Texas Instruments
(Year 7 to Year 12)

Come along and join as we delve into puzzles, brainteasers, and intriguing mathematical conundrums that ignite curiosity and foster a love for mathematics. You will engage in problems that challenge conventional thinking, encourage innovative solutions and experience strategies designed to encourage collaboration.

Key takeaways:

1. Where to find great problems!

CANCELLED A21 HOW'S YOUR MATHEMATICAL DIET?

(COMMERCIAL PRESENTATION)

Subtheme: Pedagogy

Andrew Lorimer-Derham, Think Square
(Year 7 to Year 8)

The healthy food pyramid I grew up with (carbs in the 'eat most' section) has changed dramatically, yet our mathematical diets remain the same. High in fluency, low in engagement. To thrive in the age of AI, our students need a more balanced mathematical diet. One that enables them to apply their skills in novel ways, think creatively and solve interesting problems.

You're invited to sample the unique local menu from the Maths Mate Year 7-8 textbooks:

Creative entrees to whet your appetite and promote discussion at your table. Rich mains designed to satisfy a range of palettes, paired with novel challenges infused with joy.

Come and see why over 3000 food critics (students) most commonly describe their experience as "fun, challenging, interesting and exciting".

Bring your appetite!

Key takeaways:

1. Our current mathematical diet places too great an emphasis on fluency.

2. A balanced diet provides opportunities for students to apply their learning in a novel context.

3. Creativity belongs in the 'eat most' category.

FULL A22 WAYS TO JAZZ UP YOUR SENIOR MATHS CLASSES

Subtheme: Wellbeing

Kara Fox and Lucas Cruz Rocha, Bendigo Senior Secondary College, Duane Anderson, Crusoe Secondary College
(Year 9 to Year 12)

We will provide you with a dozen different ways to jazz up your senior maths classroom including a portfolio of fun activities, use of technology, brain breaks and more. Great ideas that have worked for us for many years and helped us to connect with a wide range of students.

Key takeaways:

1. Free, ready to use resources.

2. Ideas to engage your senior students.

3. Technology you may not be aware of.

A23 VALUING MATHEMATICS THROUGH FINANCIAL LITERACY: FREE RESOURCES AND GAMES

(COMMERCIAL PRESENTATION)

Subtheme: Technology

Damian Nicholson, Financial Basics Foundation (FBF)
(Year 7 to Year 12)

Financial Basics Foundation (FBF) is an independent charity that provides free of charge to all Australian educators extensive resources and services designed to support students in developing financial life skills. FBF's new website features financial literacy teaching and learning resources, videos, activities and games In addition, we have also launched the Financial Basics Classroom Academy, an e-learning portal featuring engaging online short courses with financial literacy micro-credentials led by the classroom teacher. As with all FBF resources, The Financial Basics Classroom Academy is integrated into our website and free to all Australian educators. This session will focus on free tools for student engagement with and understanding of mathematics in the 'real-life' context of personal finance. It will showcase the freshly launched Financial Basics Classroom Academy short courses, the brand new animated MoneyIQ YouTube financial education video series and the updated ESSI Money Game.

Key takeaways:

1. Free financial literacy education resources that you can use in your next lesson.

2. Free financial literacy training courses for your students, featuring micro-credentials.

3. Free Australian-context, animated, financial literacy education videos.

Remember: An internet enabled device will let you get hands on with the free digital resources during the session.

SESSION A: Thursday, 11am-12pm (cont.)

A24 THE CRAFT OF MATHEMATICS TEACHING: GETTING THE BALANCE RIGHT

Subtheme: Pedagogy

Naomi Ingram, University of Otago
(Year 7 to Year 10)

We know that students learn mathematics by actively constructing their understanding through challenge, discovery, and discussion. We also know that students need time to consolidate their understanding and build their confidence through practice. This workshop will explore how to achieve this balance.

Key takeaways:

1. Practical ideas to use when planning a unit of work.

A25 IMPLEMENTING PSEUDOCODE AND ALGORITHMS IN PYTHON ON COMPUTER AND CAS

Subtheme: Technology

Enzo Vozzo, Mentone Grammar
(Year 7 to Year 12)

The introduction of Pseudocode in the new Mathematical Methods and Specialist Mathematics Study Design indicates that algorithms and coding are beginning to be seen as important. This presentation introduces the three key elements of algorithm design: sequencing, decision-making and repetition. These elements will be implemented using the popular open-source computer language Python on a computer and on the new TI CAS Nspire CX II calculator, which has Python built into it. Delegates will have the choice of coding a variety of simple algorithms to calculate the value of pi (using the bisection method), generate Pythagorean triples and primes, run simulations and define (create your own) mathematical functions such as factorials, sine and square roots. Python also handles complex numbers, with the ability to calculate Euler's identity in a single line of code! No experience of coding or Python is required but would be beneficial.

Key takeaways:

1. Introduction to pseudocode and algorithm design: sequencing, decision-making and repetition.

2. Introduction to the popular open-source computer language Python.

3. Choice of writing code to calculate the value of pi, generate Pythagorean triples, primes, run simulations, and define functions such as sine and square roots in terms of elementary arithmetic.

Remember: Delegates do need to have Python installed on their computer or it can be installed from the Python.org website or use a web-based version. Delegates should bring their laptop and/or TI CAS Nspire CX II which has Python built in. Python is not available on the Casio ClassPad FX-CP400.

A26 NETWORK DECISION TOOLS IN VCE GENERAL MATHS

Subtheme: Technology

Angel Wong, St. Andrews Christian College, Brian Lannen, Murray Mathematics Curriculum Services
(Year 11 to Year 12)

In this workshop, I will share valuable, time-saving resources for teaching Networks and Decision Mathematics in VCE General Mathematics. These resources include a detailed spreadsheet for critical path analysis, a TI program for the Hungarian algorithm, and Python programs for Dijkstra's algorithm and the Ford-Fulkerson algorithm (maximum flow). Participants are encouraged to bring their TI-Nspire CAS or laptops to store these files and follow along with the demonstrations. Additionally, we will have the opportunity to discuss and share further resources related to General Mathematics and Python programming. This interactive session is designed to equip educators with practical tools, enhance their teaching strategies, and foster a collaborative learning environment. By the end of the workshop, participants will possess a robust set of digital tools and resources to support their teaching of Networks and Decision Mathematics, as well as new ideas generated through peer discussions.

Key takeaways:

1. Acquire practical, time-saving digital tools for teaching Networks and Decision Mathematics.

2. Learn to implement Python and TI-Nspire CAS programs for key algorithms.

3. Engage in collaborative discussions to discover additional resources and enhance teaching strategies.

Remember: Mainly TI calculator with Python module installed or Laptop computer with Visual code or Visual studio that can execute Python codes.

A27 TEACHING NETWORKS IN GENERAL MATHEMATICS

Subtheme: Pedagogy

Jessica Mount, The Mathematics Association of Victoria (Year 11 to Year 12)

Teaching networks as part of the General Mathematics Unit 4 course. The session will cover hints and tips for teaching networks and how to prepare students for the VCE General Mathematics examination. Ideas for writing a networks SAC will also be shared.

Key takeaways:

1. Hints and tips for teaching networks.

2. How to answer difficult VCAA examination questions.

3. Ideas for preparing a networks SAC.

FULL A28 EXPLORING APPROACHES: REPLENISHING VCE RESOURCES AND ENHANCING EXAM PREPARATION

Subtheme: Curriculum

Peideng Nie, Austin Education Pty Ltd (Year 9 to Year 12)

In this workshop, the presenter will provide a number of selected past or recent exam questions/assessment items for analysis group discussion. Additionally the presenter will explore, compare and articulate various approaches to develop open-ended tasks or summative assessments within the scope of 2023-2027 VCAA study design, and provide common templates for exam/assessment tasks and introduce useful tools, softwares or packages in the resource development.

Key takeaways:

1. Establish further networking with others in VCE subjects.

2. Exchange ideas, refresh and replenish professional repertoire with other approaches.

3. Explore effective and efficient approaches to develop quality assessments, from both practical and innovative points of view.

Remember: Please bring your laptop. The presenter will provide handouts and share other relevant documents during the session.

SESSION B: Thursday, 12.10pm-1.10pm

B01 INTRODUCING EXPLICIT TEACHING AND THE MATHEMATICS HUB

Subthemes: Pedagogy, Wellbeing

Helen Chick, University of Tasmania
(Y3 to Y6)

There has been plenty of discussion over many years about the kinds of teaching approaches that might be helpful for students' learning. Some of them have the word 'explicit' in them. Is an 'explicit' approach a good thing or a bad thing? Last year, the Mathematics Hub (www.mathematicshub.edu.au), which is part of the *Maths in Schools* Federal Government initiative, released a set of learning modules about 'explicit teaching', with a framework to help teachers think about effective lessons. In this presentation, I will introduce you to the Explicit Teaching framework, and the Mathematics Hub's set of free professional learning modules that will help you learn more. We'll discuss some of the key ideas, do some planning using the framework, and take away an activity that could be used in the classroom.

Key takeaways:

1. Conceptualisations of explicit thinking.

2. Knowledge of professional learning modules.

3. Activity resources for teaching.

B02 NURTURING ALGEBRAIC THINKING IN THE EARLY YEARS

Subtheme: Pedagogy

Rebecca Seah and Marj Horne, RMIT
(F to Year 2)

As soon as young children start working with number, they start encountering algebraic ideas. Pattern recognition and creation, understanding of equivalence and representations and reasoning about them are critical in the development of number and mathematics generally. Participants at this workshop will engage with some activities used in the early years to foster attention on patterns and relationships between numbers, symbols and problem-solving situations. Come and explore some tasks reflecting on how they engage young children with algebraic thinking.

Key takeaways:

1. Activities for developing algebraic thinking in early years.

2. Ways to nurture children's curiosity and attention to big ideas in algebraic thinking.

3. Reflections on supporting understanding of equivalence and patterns.

Remember: Paper and pen.

FULL B03 MATHEMATICAL MODELLING IN THE PRIMARY YEARS

Subtheme: Curriculum

Amy Somers, Westall Primary School, Renee Ladner, The Mathematical Association of Victoria
(F to Year 6)

With the implementation of the revised curriculum for mathematics we see the mathematical processes become more evident and explicit. In this session we will look at the process, mathematical modelling. This session is aimed at primary school teachers and leaders. We will provide ideas and resources that teachers can use to enrich the use of mathematical modelling tasks in their practice and will support teachers to try some tasks for themselves. We will also look at various mathematical modelling cycles and where these tasks have been explicitly linked in the revised mathematics curriculum.

Key takeaways:

1. Using mathematical modelling in primary school mathematics.

2. What research says about mathematical modelling.

B04 PLANNING FOR MATHEMATICAL CONNECTIONS IN THE PRIMARY YEARS

Subtheme: Curriculum

Kate Eastcott, Cowes Primary School
(F to Year 6)

Effective maths planning builds collective teacher efficacy, allows for intentional connections between mathematical ideas to be highlighted, and leads to the development of

strong numeracy skills and understanding in students. Making connections between strands, with other curriculum areas, and with the real world provides students with a deeper understanding of mathematics and how concepts build on and link to each other. This understanding creates an appreciation for the real-world usefulness of mathematics. In the session, I will model how I have used the Mathematics 2.0 Curriculum, along with Professor Di Siemon's Big Ideas in Number and planning matrix to develop a whole-school annual overview that feeds into term and lesson sequence planners. The planning documents are made with formative and summative assessment in mind, incorporate connections to other curriculum areas, and guide the day-to-day planning of year level teams.

Key takeaways:

1. How to plan annual overviews that lead to term and sequence planners.

2. How to use Professor Di Siemon's planning matrix to find the connections in the mathematics curriculum.

3. How the Curriculum 2.0 lends itself to making mathematical connections.

B05 ADDING' ZING' TO YOUR MATHS SESSIONS

Subtheme: Wellbeing

Bernard Kerrins, St Francis of the Fields Primary School (F to Year 6)

Engagement in maths education has long been an issue for children, teachers and parents. Through encouraging a mindset of growth and development and instilling self-confidence and esteem within the children, this session is for those looking for ways to make their lessons more meaningful, relevant and enjoyable, while at the same time helping children to develop a love for the learning of maths. Rather than looking for change, *you* can be that change! Your students, like mine will look forward to maths each day. This workshop looks at methods, approaches and proven strategies to instil a love and enjoyment for the learning and teaching of maths. This is a very hands-on session with examples of how to structure the activities to be suitable for all primary levels, across all maths curriculum topics, link them to assessment data and how to alter them over time to maintain engagement.

B06 OPTIMISING TEACHER WORKLOAD AND MEETING STUDENT NEEDS THROUGH COLLABORATIVE PLCS

Subtheme: Leadership

Ramya Deepak Kumar and James Dixon, Mount Waverley Primary School (F to Year 6)

Teacher workload is massive and time precious. We know our student needs change every year with cohort demographics. We believe our teachers are knowledgeable professionals who are experts in designing learning for their students based on learning needs. The solution lies in true collaborative PLCs where a team of teachers work together to analyse student learning data, identify relevant curriculum standards and plan learning experiences that align with student learning needs. This is supported and scaffolded by a strong evidence based instructional model, robust and structured meeting agendas that promote deep data dive and reflection and continuous leadership support.

Key takeaways:

1. Collaborative numeracy planning - The why, what and how.

2. Collaborative data analysis to facilitate point of need teaching.

3. Collaborative planning of high quality instructional experiences.

FULL B07 RICH MATHEMATICAL TASKS - BRINGING LAUNCH, EXPLORE, AND SUMMARISE TO LIFE

Subtheme: Pedagogy

Brendan Hodge and Kayla Campbell, Orchard Park Primary School (F to Year 6)

This professional learning session focuses on the Launch, Explore, Summarise instructional approach to teaching primary mathematics. We will unpack the instructional sequence and examine the distinct roles of teachers and students within it. A real-life example used in schools will illustrate these steps in practice. We will highlight rich mathematical tasks that encourage deep thinking and demonstrate the power of this approach in fostering a rich,

engaging learning environment and enabling students to explore concepts through guided discovery and collaborative problem-solving.

Key takeaways:

1. Clear primary maths instructional sequence

2. Rich mathematical tasks.

3. Summary of roles of teacher and students within a maths lesson.

B08 ADAPTING TO CHANGE: INVESTIGATING ESSENTIAL ASSESSMENT PRACTICES WITH VICTORIAN CURRICULUM 2.0 (COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Jacinta Browning and Jacqueline Clark, Essential Assessment
(F to Year 10)

Change is an inevitable part of education, and embracing and managing these changes is essential for continuous improvement in educational outcomes. With the introduction of the Victorian Curriculum 2.0, educators have a valuable opportunity to enhance their teaching practices and better support their students' mathematical development. This session aims to ensure that teachers can effectively navigate the changes brought by the Victorian Curriculum 2.0, ultimately leading to enhanced mathematical understanding and success for all students. Join us to explore how Essential Assessment will continue to improve educational outcomes and support learners at your school.

Key takeaways:

1. Curriculum-aligned assessment techniques to identify starting points for each student within the new curriculum framework.

2. Methods for using formative assessment to support and track student growth in alignment with the new curriculum.

3. Clear alignment with pedagogical principles presented by Rosenshine's Principles of Instruction, emphasising explicit instruction and effective feedback.

B09 LOVE LANGUAGES IN A MATHEMATICS CLASSROOM

Subtheme: Wellbeing

Kimberly Silva, Mount Rowan Secondary College
(Year 5 to Year 10)

Teaching always explores the psychology of human relationships. In this session, participants will take a closer look at the *5 Love Languages* by Gary Chapman and use them to foster a deeper understanding on how students learn better in the mathematics classroom. The five love languages describe ways by which people express and receive love in a relationship. Using what we know about our students' love languages can help when building positive relationships and enhance mathematics learning. Most often, students viewed mathematics as a dry and boring subject. This is because we always project our own love language to our students. Mastering love languages gives teachers countless creative ways to stimulate students' participation and enthusiasm in the class. Regardless of how much you care about your students, if you do not communicate it in terms they can understand, they will never be able to feel it.

Key takeaways:

1. To explore the 5 love languages.

2. To know your own love language/s and that of your students.

3. To master the love languages so that you can adjust your pedagogy to make maths learning more meaningful for your students.

Remember: Laptop or phone.

B10 BUILD ME UP: IMPROVING TEACHER COMPETENCE WITH SECONDARY MATHS

Subtheme: Pedagogy

Danijela Draskovic, The Mathematical Association of Victoria
(Year 5 to Year 12)

Join us for an informative and immersive session on The Mathematical Association of Victoria's newest initiative - the Build Me Up (BMU) program! This innovative project addresses the pressing need for secondary mathematics

content knowledge, particularly for out-of-field teachers. Funded by the Department of Education's Strategic Partnerships Program, BMU aims to upskill teachers in delivering 7-10A mathematics with confidence and competence. In this session, you will get insight into what this program offers and what is included within it. You will discover the structure of BMU, featuring 12 online, on-demand modules. Each module is designed to be accessible at your own pace and focused on key areas of mathematics, delivered by subject matter experts. By exploring the program through the virtual portal, you will get a feel for how it may help you or your colleagues upskill themselves in secondary mathematics content.

Key takeaways:

1. Comprehensive Build Me Up (BMU) program insight through immersion into the course.

B11 CARD COLLECTOR – AN INTERESTING PROBLEM FOR INVESTIGATION

Subtheme: Curriculum

Brian Lannen, Murray Mathematics Curriculum Services, Angel Wong St Andrews Christian College
(Year 9 to Year 12)

Consider that a breakfast cereal company is running a promotion by inserting a famous mathematician card into each box of cereal. If there are six different cards in the set and the placement of cards is equal and random, how many boxes of cereal on average would you expect are needed in order to collect the full set of cards? Participants will partake in hands-on investigation of the card (or coupon) collector problem with the opportunity to explore through intuition, simulation and calculation. This classic problem could be used as the basis for a Mathematical Methods investigation task, specifically examining expectation, probability distribution and confidence intervals. However, at a basic level, it is also accessible to junior students and can be used to meet the F-10 curriculum requirement to 'conduct simulations, using digital tools to determine probabilities and describe results (VC2M8P03).'

Key takeaways:

1. Resource materials that could form the basis of a VCE Mathematical Methods investigation task.

2. Activities that can help fulfil the F-10 curriculum requirement to 'conduct simulations, using digital tools to determine probabilities and describe results'.

3. Appreciation of the underlying mathematics of a classic problem of probability.

Remember: Not essential, but a CAS calculator of your preferred platform will be helpful.

B12 WHAT'S THE POINT? EXPLORING TOOLS FOR TEACHING DECIMALS EFFECTIVELY

Subtheme: Curriculum

Carmel Mesiti and Kate Copping, Faculty of Education, The University of Melbourne
(Year 3 to Year 8)

Do you want to enhance your teaching of decimals? Understanding decimals is key for students' numerical proficiency and mathematical literacy. This presentation explores four tools to enhance decimal comprehension: decimat, number expander, hundreds grid, and a decimal comparison model. Each tool offers unique strategies for teaching decimals. We will explore their benefits and limitations for classroom use. You will learn how to integrate these tools into your teaching practices, aligning with the Victorian Curriculum Mathematics 2.0. Come along to gain a comprehensive understanding of each tool's pedagogical potential and practical strategies for effective implementation in primary classrooms.

Key takeaways:

1. Importance of decimal understanding.

2. Exploration of four teaching tools.

3. Practical application and curriculum alignment.

SESSION B: Thursday, 12.10pm-1.10pm (cont.)

B13 MATHS IN SCHOOLS - FREE ONLINE LEARNING FOR TEACHERS

Subtheme: Pedagogy

Celia Coffa, CSER
(F to Year 10)

In this session, we will introduce the Maths in Schools project, which provides free online professional learning courses for teachers of Mathematics. The online courses support contemporary evidence-based approaches to mathematics teaching from Foundation to Year 2, Years 3-6, and Years 7-10. A particular focus of the courses is the CRA model and culturally responsive mathematics pedagogies. All the courses are based on the Australian Curriculum: Mathematics V9.0 and, as such, provide an excellent tool to unpack the key changes. In this session, we will enrol in a free online course and unpack various ways that teachers and leadership teams can use the resources to familiarise themselves and their teams with the new curriculum whilst highlighting various pedagogies. The Maths in Schools project is funded by the Australian Government Department of Education and is conducted in partnership with Education Services Australia.

Key takeaways:

1. Knowledge of the content, structure and location of free online courses for teachers

2. Awareness of the intended audience of the resources.

3. Understanding of the wide variety of ways the online courses can be used by teachers and leadership teams.

B14 CRITICAL CONNECTIONS BETWEEN LANGUAGE, LITERACY, MATHEMATICS AND NUMERACY

Subtheme: Pedagogy

Dave Tout, ACER and University of Melbourne
(F to Year 12)

Why do teachers of numeracy and mathematics also need to be language and literacy teachers? This presentation and hands-on workshop will look at issues related to the relationship between numeracy and mathematics, and the crucial roles that language and literacy play in the teaching and learning of both mathematics and numeracy. Based on this analysis, what are some of the key challenges in how to teach numeracy and mathematics successfully taking the language aspect on board, and what are some teaching strategies and approaches that support and integrate the language of mathematics into our classroom practices. A range of different hands-on activities and strategies will be demonstrated that can be used in your classrooms.

Key takeaways:

1. Rationale fand evidence or why literacy and language issues are critical in teaching numeracy/maths.

2. Examples of classroom activities on how you can address this in your teaching practices.

B15 EFFECTIVE AND EFFICIENT NUMERACY PEDAGOGY THROUGH CONNECTED CURRICULUM

Subtheme: Pedagogy

Gloria Yi, St Albans Secondary College, Milton Bai, Kensington Community High School
(Year 5 to Year 10)

This session introduces an innovative pedagogy: the connected curriculum approach to teaching the mathematics curriculum across the 3 strands: number and algebra, measurement and geometry and statistics and probability. The approach was inspired by Emeritus Professor Peter Sullivan's research and workshop, which aimed at enhancing numeracy engagement by linking learning activities and assessments to real life, and in particular, students' daily life, and improving maths teaching efficiency by covering multiple strands within one unit. Assessments of the approach included the three levels of complexity: fluency, problem solving, and reasoning, which are clearly outlined in the rubric. The approach is suitable for upper primary, junior secondary and pre-VCE VM pathway students, and has been applied and proven effective in both secondary mainstream and alternative settings. We will share our resources and demonstrate how to apply the approach at your school.

Key takeaways:

1. Introduction to an innovative teaching approach.

2. Discussions and resources of the approach and examples.

3. Opportunities to create programs for your school.

Remember: Hard copies and digital copies of handouts will both be provided. Please bring a pen and/or a charged device.

B16 EXPLORING THE PEDAGOGICAL POWER OF VERTICAL WHITEBOARDS AND RANDOM GROUPS

Subtheme: Pedagogy

Jessica Kurzman, St. Patrick's Primary School (F to Year 10)

This interactive presentation offers an engaging exploration of innovative pedagogical practices combining the concepts of vertical whiteboards and random groupings. Vertical whiteboards are large, erasable surfaces positioned vertically in classrooms, in order to spark dynamic collaboration. Random groups, composed of three students each, are formed completely randomly to further enrich collaborative, deep thinking tasks. Inspired by the pioneering work of Peter Liljedahl, along with my own research conducted in a primary school setting, we delve into the impact of these strategies on student learning and engagement. By experiencing these techniques firsthand, participants will gain invaluable insights into fostering active learning environments. Throughout the session, attendees will immerse themselves in theory, evidence and practical demonstrations. They will leave equipped with the tools and confidence to implement these strategies effectively in their own classrooms. Come along and embark on a journey to nurture curiosity, collaboration, and critical thinking skills among students.

Key takeaways:

1. Discover the research around vertical whiteboards and random groups to enhance student learning and engagement.

2. Develop confidence using vertical whiteboards and random groups.

3. Experience effective pedagogical strategies to create dynamic, student-centred classrooms.

B17 DEVELOPING STUDENTS' CONFIDENCE AND CAPABILITIES IN CAS FOR PRE-VCE STUDENTS

Subtheme: Technology

Sydney Tao, Strathcona Girls Grammar School (Year 9 to Year 12)

Sydney will explore strategies for enhancing Year 10 and Year 11 Methods and Specialist students' confidence and proficiency with the CASIO ClassPad II. The focus is on early engagement with CAS tools to prepare for Year 12, emphasising practical timing and application techniques. Through interactive demonstrations, Sydney will illustrate key functionalities and provide attendees with handouts for student or teacher use, aiming to facilitate a CAS Masterclass ahead of assessments. The content serves as a condensed, targeted adaptation of the CASIO user's manual, designed to demystify CAS operations and integrate them seamlessly into mathematical learning, thereby equipping students with essential skills for their senior years.

Key takeaways:

1. Handout for conducting a CAS Master class - including different levels of examples from Year 10 to Year 11 Specialist.

2. Some CAS tricks include user-defined functions, with examples in different levels.

3. Understand how to translate plain English words into CAS syntax.

Remember: Please bring a CASIO Classpad, a pen, and a positive mindset!

CANCELLED B18 CONTROL TO COLLABORATION: FOSTERING LEARNING AND GROWTH AT EVERY LEVEL.

Subtheme: Pedagogy

Dale Heterick, Ashleigh Owens and Molly Ellis, Kew Primary School (F to Year 6)

We will share a story about our journey as mathematics leaders in practice, our staff's progression towards becoming an effective mathematics learning community, and our students' development of productive dispositions in learning mathematics like mathematicians. We will highlight our approach of tempering our initial eagerness for rapid change

SESSION B: Thursday, 12.10pm-1.10pm (cont.)

and instead focusing on deeper exploration of concepts with both students and staff. Key areas we will delve into include:

- Progressing towards widespread adoption of Launch, Explore, Summarise lessons in our planning.
- How we are empowering teachers to get out of the way and allow their learners to take control.
- Developing a learning and teaching model that works.
- Developing planning structures and documentation that reflects our practise.
- Using data to anticipate students' responses.
- Targeting our whole staff professional learning to the needs of our staff.
- Building a culture of learning and willingness to be evidence based.

Key takeaways:

1. The real work happens in planning.

2. The opportunity to learn is more important than showing learners 'how'.

3. When implemented effectively, change blends seamlessly into existing practices without disruption.

4. The learning journey is the same for leaders, teachers and students.

B19 QUESTIONING TECHNIQUES TO BUILD CONCEPTUAL UNDERSTANDING OF FACTION CONCEPTS (LEVEL 5-8)

Subthemes: Curriculum, Pedagogy, Leadership

Leonie Anstey, The Mathematical Association of Victoria (Year 5 to Year 8)

The use of questioning is a fundamental tool that we know can enhance thinking and student engagement in mathematics learning. If you have wondered different styles of questioning to support student understanding? In this session, Leonie will share questioning tools, lesson concepts that deepen conceptual understanding and build learning proficiency.

B20 VARIABLES VARY – SYMBOLIC AND ANIMATED REPRESENTATIONS OF VARIATION

Subtheme: Curriculum

Alastair Lupton, Adelaide Botanic High School (Year 7 to Year 10)

To develop a sophisticated understanding of algebraic representations, which is key to senior secondary success, our students need to appreciate the difference between a variable and an unknown, to have some sense of the meaning conveyed by expressions like $2x + 4$, and, more generally, to understand the answer to 'why do we have to use letters instead of just numbers when doing mathematics?' These ideas form with early experiences of algebra, which need to plant some of these seeds. This workshop will share an approach which focussing on the teaching of identities (starting with the distributive law of multiplication) rather than processes (expand, factorise), using video to see quantities varying, and variables as a sensible way to capture this variation. These videos can be followed by a sequence of reinforcing activities, which will also be shared.

Key takeaways:

1. Variables vary (and constants are constant). Video is a powerful way to see variation, and algebraic/symbolic representations are powerful ways to describe and work with that variation.

B21 REVIEWING THE 2023 MATHEMATICAL METHODS EXAMINATIONS

Subtheme: Pedagogy

Allason McNamara, Trinity Grammar School, Cathy Devlyn, Melbourne Grammar School (Year 11 to Year 12)

Allason and Cathy will do a similar session to the 2024 MAV Meet the Examiners lecture for Mathematical Methods. They will discuss common errors that students made on the 2023 examinations. Cathy will talk about Exam 1 and Allason Exam 2. The statistics for each question will also be shown.

Key takeaways:

1. Teachers will be aware of the common mistakes students make in Mathematical Methods examinations.

2. The session will help teachers to plan their 2025 classes for effective student learning.

Remember: Bring the 2023 Examination papers.

FULL B22 MATHEMATICS ENGAGEMENT IN YEARS 9 AND 10 - SUPPORT FOR TEACHERS AND STUDENTS.

Subtheme: Wellbeing

Michelle Hackett and Lisa Hogan, Mary MacKillop Catholic Regional College
(Year 9 to Year 12)

Year 9 and 10 are difficult years and I offer help with how to engage students in maths to give them the opportunity to develop strong numeracy skills which they can use in daily life as well as carry into the future. I will share my resources as well as teaching strategies that help all students achieve success and develop a positive attitude towards not only maths but other areas of life.

Key takeaways:

1. Making the classroom environment productive for learning and success.

2. Using a variety of resources/strategies to help students learn.

3. Promotion of positive self-esteem for both the teacher and students.

B23 CAS SOLUTIONS TO 2024 MATHEMATICAL METHODS EXAM 2 (INNOVATIVE TECHNIQUES)

Subtheme: Technology

Sanjeev Meston, Strathcona Girls Baptist Grammar
(Year 11 to Year 12)

This session will focus on Computer Algebra Systems (CAS) Solutions using TI-Nspire technology, specifically the Mathematical Methods 2024 Exam. It will impart CAS skills and techniques that teachers can pass on to their students. In this session, we'll explore how CAS technology can enhance student understanding, problem-solving skills, and exam preparation and how students can best respond to multiple choice and extended response session. This session has been extremely popular with conference attendees and has always been oversubscribed. The session always has had great reviews and session feedback.

Key takeaways:

1. Understanding and brief overview of CAS.

2. CAS for Exams

3. Common challenges faced by students and how CAS can address these challenges.

Remember: CAS solutions empower students to tackle complex problems efficiently, allowing them to focus on conceptual understanding rather than tedious calculations. Let's embrace CAS tools as valuable allies in preparing students for the Mathematical Methods! Let's harness the power of CAS solutions to transform Mathematical Methods education. Join the session in shaping the future of mathematics teaching and learning!

FULL B24 MASTERING MATHS METHODS UNITS 1 AND 2: FROM NOVICE TO KNOWLEDGEABLE

Subtheme: Curriculum

Trang Pham, Methodist Ladies' College
(Year 11 to Year 12)

This session is designed to assist first-time Maths Methods Units 1 and 2 teachers in feeling comfortable and prepared for the course. The workshop will feature the following:

- An overview of the course, including a sample course plan.
- Guidance on preparing students for the course during the transition period.
- Maximising the use of the CAS calculator in tech active assessments.
- Understanding content knowledge - what is included/ excluded.
- How to teach specific concepts.
- Guidance on assessments and providing feedback.

Key takeaways:

1. Enhancing content knowledge to make concepts more interesting, enjoyable, and easier for students to learn.

2. Teaching students to effectively and efficiently use their CAS calculator in tech active assessments.

3. Developing assessments that include key knowledge and skills from the study design.

Remember: Bring your own TI-Nspire CAS calculator handheld or emulator to this workshop.

SESSION B: Thursday, 12.10pm-1.10pm (cont.)

B25 USING THE TI NSPIRE NOTES PAGE FOR OPEN-ENDED ASSESSMENTS

Subtheme: Technology

James Wing-Chung Lam and Miao-Hsuan (Felicity) Hung, Suzanne Cory High School
(Year 11 to Year 12)

To those who are looking to mark open-ended assessments more quickly, this is the session for you! The focus of this workshop-style session is to explore how the TI Nspire CAS Notes page can be used by teachers for marking open-ended assessments efficiently. A common deterrent to writing open-ended questions is that it often makes marking assessment difficult and, at times, subjective. However, with the CAS Notes page in tandem with carefully constructed constraints, open-ended questions can allow students to demonstrate both content knowledge and creativity in their responses. While the session will focus on developing proficiency with the CAS Notes page via Mathematical Methods content, the skills can be applied to other maths subjects. We will begin with a tutorial on creating a Notes page for assisting a marking scheme, followed by an opportunity to create your own Notes page for a given marking scheme (or your own).

Key takeaways:

1. Use the CAS Notes page to mark/check open-ended questions efficiently.

2. Highlight the benefits of open-ended tasks for students.

Remember: A laptop with TI-Nspire CAS software (any version) installed is needed for this session. A handheld TI-Nspire CAS calculator can be a possible alternative, but will generally make the typing process much slower when delegates are given the opportunity to create their own resource.

B26 PROBABILITY ENRICHED THROUGH SIMULATION IN MATHEMATICAL METHODS

Subtheme: Technology

Frank Moya, Educational consultant
(Year 11 to Year 12)

Simulation is an invaluable pedagogical tool for the teaching and learning of probability and statistical inference, and for carrying out mathematical investigations involving random events. In this session, participants will use TI-Nspire CAS technology to explore various techniques to set up and run simulations that are useful in teaching various topics from the probability area of study, as well as in investigation tasks. These simulation techniques can be adapted to other technology platforms. The session will aim to provide some innovative teaching ideas, as well as tips on effective use of technology, including ways of dynamically displaying simulation results to visualise key concepts and gain a deeper understanding of the topic.

Key takeaways:

1. Gained insights into the pedagogical use of simulation to develop deeper understanding of probability concepts.

2. Learned ways of using functionalities of technology to set up some simulations.

3. Received a number of proven ready-to-use probability simulation activities to adapt in their classrooms.

Remember: TI-Nspire CX II CAS is the featured technology. Participants should bring their own calculator or software, loaded with the latest operating system (OS 6.0). Users of other technology platforms are most welcome.

B27 RANDOM WALKS AND COMPLEX NUMBERS

Subtheme: Pedagogy

Brett Stephenson, Guilford Young College, Leilani Stephenson, University of Tasmania
(Year 9 to Year 12)

Random walks appear to be a simple concept that can be easily modelled with technology but the mathematics that is part of the journey of 1D, 2D, 3D+ random walks take in key topics that include binomials, expected values, transience, series and divergence. This workshop will investigate the random walks with technology (Casio Classpad but suitable for any graphical technology) and then consider the underlying mathematics.

Key takeaways:

1. Links to curriculum ideas with random walk investigation

2. Utilising complex numbers in modelling situation with technology

3. Practical example of expected value, variance and transience

Remember: A Casio Classpad will be used for demonstration but the workshop can be adapted for other technology.

CANCELLED B28 MAXIMISING STUDENT POTENTIAL WITH OXFORD MATHS 7–10

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Evan Curnow and Karen De Leon, Oxford University Press
(Year 7 to Year 10)

Oxford Maths 7–10 has been reimagined for the Victorian Curriculum Version 2.0, with a suite of new resources hosted on an innovative platform. Come to this session to find out about the learning design principles that helped create this series, as we take a deep dive into the resources and features on offer and discuss how to make best use of them in the classroom. All attendees will receive a sample of the resources demonstrated in this session.

Key takeaways:

1. Find out about the resources and features on offer in Oxford Maths 7–10.

2. Take a look at our new digital platform, designed with the latest learning design principles in mind.

3. Receive a sample of resources for the Victorian Curriculum Version 2.0.

SESSION C: Thursday, 2pm-3pm

C01 OUR GO-TO TASKS AND FAVOURITE HANDS-ON MATERIALS- PRIMARY GRADES 2-6

Subthemes: Curriculum, Wellbeing

Russell McCartney and Christian Terlich, Inverloch Primary School
(Year 3 to Year 6)

Packed full of quality tasks you can easily use in your classroom the very next day! This hands-on workshop will provide you with new and engaging ways to use common classroom materials to develop students' enjoyment of mathematics. During this session, we will demonstrate a variety of 'low floor - high ceiling' tasks that are easily accessible to all students. You will have the chance to explore hands on materials which help build conceptual understanding, allowing you to teach your students in a meaningful and rewarding way.

Key takeaways:

1. Strategies to engage students.

2. Using 'low floor - high ceiling' tasks to manage differentiation.

3. Doing some enjoyable mathematics.

C02 CHALLENGING TASKS WITH FOUNDATION STUDENTS

Subtheme: Pedagogy

Lana Harris, Macalie Vlah and Melissa Paola, Essendon North Primary School
(F to Year 2)

Often teachers and leaders leave Foundation students and teachers to themselves and declare that some pedagogical practices need not apply to them. But let's face it, most 5- and 6-year-olds can run rings around us with their inquisitive nature and persistence to find the answers to something. The staff at Essendon North Primary School have been on a journey to build their Foundation students growth mindset, persistence, questioning, productive disposition all through challenging tasks. The teachers will share their experience and application of:

- The planning process: Teamwork, anticipating, developing a trajectory of learning, prioritising play-based learning, exploring key vocabulary
- Spotlighting students' thinking and progressions.
- Using formative assessment.
- Tracking the progress and development of students, knowing their next point of learning.
- How coaching has assisted in refining their practice.

Key takeaways:

1. Planning for challenging tasks.

2. Challenging task selection.

3. Building intrinsic motivation through challenging tasks.

CANCELLED C03 ENGAGING STUDENTS IN FRACTIONS AND ASSESSING WITH REASONING BOARDS

Subtheme: Curriculum

Donna McNeight, Wendouree Primary School
(F to Year 6)

Come and explore how to engage students in fractions! Fractions is that topic that is more than colouring in a half! What resources can you use? How do you assess what the students have learnt? Come and experience the process! Explore the pretest, explore the activities and see the post-test! In this session hear about a research unit about fractions where the students were pretested then absorbed in a range of activities and post tested. You will see how work samples can be used as assessment through a reasoning board and hands on activities. See the growth achieved and how it relates to the Victorian Curriculum. This a great opportunity to see the activities that you can take back to your classroom and how hands on experiences can be a catalyst for high growth.

Key takeaways:

1. How a work sample can be assessed to show growth.

2. The importance of hand on experiences to support success in fractions.

3. How a reasoning board can be used as a form of assessment.

C04 TEACHING FRACTIONS: MULTIPLE INTERPRETATIONS AND CHALLENGING TASKS FOR MIDDLE/UPPER PRIMARY

Subtheme: Curriculum

Jane Hubbard, Monash University, Hannah Marino, St Johns XXIII
(F to Year 6)

Developing a strong conceptual understanding of fractions requires students to have learning experiences in which they are encouraged to think flexibly about fraction representations and interpretations. Moving beyond the part-whole construct, Jane and Hannah have designed a sequence of fractions lessons for the middle years (Year 3 and 4) that are embedded in a challenging task and structured inquiry approach. This workshop will provide opportunities for participants to familiarise themselves with the important mathematical ideas introduced within the proposed sequence of learning tasks as well as consider the implications for using these tasks in their own school contexts.

Key takeaways:

1. Practical tasks to try back at school.

2. Tips for implementing challenging tasks in your classroom.

3. Tips for planning a unit on fractions.

C05 STRENGTHENING NUMERACY LEADERSHIP THROUGH TRUST TO PROMOTE COHESIVENESS.

Subtheme: Wellbeing

Stephanie Felix, Cranbourne West Primary School
(F to Year 6)

This workshop is designed to support Numeracy Leaders in developing their roles and enhancing staff capacity through an observation and feedback process, and creating a mentoring and coaching cycle. I will share how I have used these processes to foster a trusting culture within my school, thereby building confidence and capacity. An effective mentoring and coaching cycle not only improves teacher capacity but also helps reduce maths anxiety. Leaders will learn how to build trust with staff, allowing them to enter classrooms with confidence and ease, work with small groups on common goals, develop an observation processes, provide relevant feedback, and build staff confidence through shared objectives.

Additionally, the workshop will cover how to develop staff capacity to observe each other's practice, promote teacher professional growth and foster confidence in a supported environment.

Key takeaways:

I will share:

1. A toolkit of ready-to-use resources.

2. Improved capacity to observe and mentor teachers.

3. Confidence in leading numeracy into the future.

C06 SHINING THE SPOTLIGHT ON POLYA'S PROBLEM SOLVING MODEL

Subtheme: Pedagogy

Taryn Volpe and Nikki D'Antonio, Limitless Maths
(Year 3 to Year 6)

This session will focus on the impact of George Polya's Problem Solving Model and the pivotal role that Professional Learning Communities (PLC's) and teacher collaboration played in the whole-school implementation of this model in a Primary setting. Nikki and Taryn will unpack what each phase of the model looks like in practice, shining the spotlight on how each of the mathematical proficiencies are embedded into the model. They will share real examples and student work samples along the way, providing authentic and practical ways that teachers can analyse and assess their students' problem-solving skills. You will walk away with a bank of resources and strategies designed to support leaders and teachers to implement the model into their own classroom.

Key takeaways:

1. Understand the role PLC's can play in the implementation of Polya's Problem Solving model.

2. Identify how the mathematical proficiencies are embedded within each phase of the model.

3. Be exposed to a practical example of how student problem solving tasks can be analysed and assessed.

SESSION C: Thursday, 2pm-3pm (cont.)

C07 REASONING: EMPOWERING STUDENTS WITH MATHEMATICAL THINKING

Subtheme: Pedagogy

Bridgeen Pritchard, Catholic Education Diocese of Wollongong
(F to Year 6)

We know the importance of reasoning for making sense of learning in mathematics. This is a skill that must be developed from the early years of a person's education. Reasoning helps us to connect important mathematical ideas, making new learning easily accessible and understood. It is a process that is grounded in action; yet we are finding it difficult to include in our planning. This practical workshop explores the importance of mathematical reasoning and demonstrates practical ways that it can be achieved.

Key takeaways:

1. Assessing mathematical reasoning.

2. Understanding some strategies to develop mathematical reasoning in students.

3. Engaging in reasoning processes to appreciate the importance of reasoning.

FULL C08 THE NUMERACY WHEEL: HOW TO EMBED NUMERACY ACROSS THE CURRICULUM

Subtheme: Curriculum

Samantha Horrocks, Northern Bay P-12 College
(Year 7 to Year 12)

The Goos Numeracy Model and the Sullivan N Framework were developed in the last decade. Both underpin the current teaching of numeracy internationally. My Numeracy Wheel aims to build on these ideas and provide a framework for teachers to clarify their understanding of a broad range of numeracy strategies and enable them to implement the most appropriate of these for their cohort of students. This session aims to enable middle level leaders and teachers to workshop how to deliver, implement and embed numeracy across the Curriculum in their schools.

Key takeaways:

1. Strategies you can use straight away for your students aimed at point of need.

2. A clear visual to enable teacher PD in numeracy.

3. Opportunity to share and discuss the issues with implementing numeracy across the curriculum.

CANCELLED C09 MENTORING STUDENTS IN THE MATHS TALENT QUEST COMPETITION

Subtheme: Curriculum, Pedagogy, Wellbeing

Ruth Evans, Mentone Grammar School
(F to Year 6)

This workshop is not just for teachers who would like to get involved with the Maths Talent Quest competition. It also offers strategies for providing challenging and stimulating hands-on learning experiences for junior primary students with different levels of ability in different domains (asynchronous development). Participants will come away with practical strategies and resources for mentoring students in the Maths Talent Quest, developing units of inquiry and differentiating the curriculum. Thinking skills will be addressed, with templates provided to assist with developing metacognition and tracking projects.

Key takeaways:

1. Meet students where they are at. Maths Talent Quest projects should be based on students' interests and research questions phrased using their words.

2. Recognise that children (especially gifted children) have asynchronous development.

3. Scaffold for success! Use templates to support students to go deeper with their learning and meet criteria.

C10 MATHS ON A MAT: THREE GENERATIONS

Subtheme: Pedagogy

Matt Skoss, NT Dept of Education, Doug Williams, Black Douglas Professional Services, Eleni Pilafas, Croydon Hills Primary School
(F to Year 10)

Come and experience three generations share their experiences in using the Maths Mat and Sorting Network - Doug Williams, Matt Skoss and Eleni Pilafas.

This session is a hands-on exposure to a double-sided mat on a large tarpaulin:

- 10 x 5 grid.
- Sorting Network.

The Maths Mat will be used to model a range of mathematical tasks, from Early Childhood to Year 10:

- children to construct their own mathematical concepts.
- kinaesthetic learning styles to be catered for.
- multiple representations of ideas.
- cooperative learning in a risk-taking atmosphere.

The Sorting Network, from Computer Science Unplugged, models the sorting of data that is done millions of times every second around the world, presented in a way that allows students to compare whole numbers, fractions, decimals, etc. We hope you will be inspired to make your own Maths Mat and Sorting Network and continue the legacy.

Key takeaways:

1. Some memorable approaches to teach and assess a wide range of mathematical concepts.

2. Photos to share with colleagues back at school.

3. An idea on how to make both mats back at school.

Remember: Come prepared to participate in some large scale mathematical activities. Bring your phone to take photos.

C11 TOP 5 MUST HAVE MANIPULATIVES FOR MIDDLE SCHOOL

Subtheme: Pedagogy

Nadia Abdelal, EM Maths Consulting
(Year 5 to Year 10)

If you were asked to choose five maths manipulatives for your classroom, what would you choose? In this session, I will introduce you to what my choices would be and show you how I would use each of them to enhance student learning. We will use games, guided tasks and open-ended activities along with these tools; to support a more holistic approach to student learning this still focuses on targeting student outcomes.

Key takeaways:

1. Mathematics manipulatives.

2. Hands-on learning.

3. Guided instruction.

C12 THE ROLE OF METACOGNITION IN MATHEMATICAL PROBLEM SOLVING

Subtheme: Pedagogy

Dianne Siemon, RMIT University, Kathryn Arnold, Auburn South Primary School

(Year 3 to Year 8)

Problem solving can and should be taught. This workshop will explore the role of metacognition in shaping students' approaches to mathematical problem solving, and what is involved in helping students become proficient problem solvers. It will also offer a research-based framework for choosing and using a range of problems for the purpose of developing the problem-solving capacity of all students in Years 3 to 8.

Key takeaways:

1. Problem-solving, metacognition

SESSION C: Thursday, 2pm-3pm (cont.)

C13 GIVING A GUERNSEY TO GEOMETRY: EMBEDDING GEOMETRY IN PRIMARY CLASSROOMS

Subtheme: Pedagogy

Bernadette Mercieca and Connie Galati, Australian Catholic University
(F to Year 8)

Geometry is a mandated part of the Victorian curriculum. It helps to build spatial reasoning in students and develops their logical thinking, deductive and analytical reasoning skills, along with problem-solving skills. However, it is often the Cinderella topic in Maths, being taught late in the year and considered just a fun but less important part of Maths. Further, many schools lack the resources to teach this subject in a developmentally appropriate way (Zimmermann, 2019). The Victorian Curriculum indicates that geometry should be taught with concrete models in the early years moving towards more abstract representations in the later years of primary school and early secondary school. Van Hiele's levels of Geometric thought will be used to discuss key practical strategies to teach geometry purposefully from years F- 8. This will include the use of examples and non-examples, using the Concrete-Representational-Abstract approach with various manipulatives and visualising and classifying with geo-sticks.

Key takeaways:

1. Practical ideas to implement in your classroom from F-8.

2. Opportunity to explore and evaluate concrete materials in an interactive session.

C14 FUNDAMENTAL MATHS INSTRUCTIONAL STRATEGIES: QUESTIONING & DISCUSSION

Subtheme: Pedagogy

Elizabeth Irwin, High Impact Leading and Learning (HILL) Group Consultancy Pty. Ltd
(F to Year 8)

Join us for a practical, transformative workshop that delves into the art and science of fostering rich questioning and discussion in the mathematics classroom. Aligned with the goals of NCTM and Australian Mathematics Curriculum v9, our aim is to'nurture confident, creative users and communicators of mathematics'.

In this hands-on session, we will explore the nuances of crafting deep and probing questions that not only engage students with the content but also encourage them to consider and explore the diverse perspectives and conjectures of their peers. Through practical strategies and tools, you will further refine the skills to facilitate meaningful discussions that promote active participation, critical thinking, and collaborative problem-solving. This workshop offers valuable insights and techniques to elevate your mathematics instruction and create dynamic learning environments where students thrive as mathematicians and communicators.

Key takeaways:

Leave with:

1. Practical techniques for planning and implementing purposeful questioning to assess and gather evidence of student thinking.

2. Practical techniques to enhance opportunities for students to engage in rich and rigorous mathematics.

Remember: Bring mobile device/laptop.

C15 REPRESENTING DECIMAL FRACTIONS FROM CONCRETE TO THE ABSTRACT.

Subtheme: Pedagogy

Kris Westcott, Sackville Street Public School
(Year 3 to Year 8)

For many teachers, the go to manipulatives for teaching decimal fractions are MAB blocks and money. Both can confuse rather than support beginners. Complications with MAB include relating the blocks to whole number thinking and modelling decimals using discrete and/or area models. While money is a highly abstract representation, the smallest increment of Australian currency being the 5-cent piece, denying students the ability to build by hundredths (cents) up to the dollar. Further, the physical representation of 1-cent,10-cent and $1 are not proportional. This hands-on workshop will engage participants, as a class of students, approaching their learning of decimals to one, two and three decimal places. The session will model a series of collaborative tasks that have engaged and supported students from Years 4 – 6 to develop a deep conceptual understanding of decimal place value. Participants will explore, structured and unstructured materials commencing with a purely linear model.

Key takeaways:

1. Lesson sequences that build deep understanding.

2. Resources that support conceptual understanding.

C16 TEACHING MATHS LIKE THE LANGUAGE OF THE UNIVERSE

Subtheme: Curriculum

Paul Bowyer, Mathematicalendar
(Year 3 to Year 10)

Galileo's most famous quote was that 'Maths is the language of the universe!' This presentation will give you practical ways to bring the universe into your maths classroom, playground and beyond! Once students realise maths is the language of the universe - that they're speaking the language of the universe when they're doing maths - it can really change their minds about maths!

Key takeaways:

1. Maths is the language of the universe.

2. Maths is in everything, often hidden in plain sight.

3. Ways of making you and your students aware.

C17 MACRO:FUN WITH MICRO:BITS

(COMMERCIAL PRESENTATION)

Subtheme: Technology

Peter Fox, Texas Instruments
(Year 7 to Year 12)

Join us in this dynamic workshop as we unlock STEM potential with Micro:bits. Discover how the Micro:bit, a cheap, pocket-sized micro-controller can revolutionise mathematics education by engaging students in hands-on project-based learning. From coding challenges to real world applications, this workshop will empower you with innovative strategies to integrate Micro:bits into the mathematics curriculum and inspire the next generation of problem solvers.

Key takeaways:

1. Put the M into steM.

2. Naturally and meaningful integration of coding in the mathematics curriculum.

3. You will write your first Python Program in this session. No prior experience required!

C18 BRING THE LAUNCH TO LIFE! STUDENT ENGAGEMENT THROUGH PROBLEM SOLVING.

Subtheme: Pedagogy

Maree Croft and Liz Dewar, Love Maths
(F to Year 6)

This session will look at the Launch, Explore, Summarise instructional model, which offers a dynamic framework for using problem solving effectively in the classroom. We will focus specifically on the Launch phase, where the primary goal is to spark students' interest and set the stage for exploration. We will explore current classroom research and practice that demonstrates the importance of using relevant, challenging tasks to enhance student engagement. Educators will gain ideas for creating engaging mathematics tasks with authentic contexts and see examples of lessons that have been taught in primary classrooms across Victoria. We will share strategies to modify tasks, making them more interesting for the students in your class.

With an engaging Launch, students are eager to delve deeper into the content being explored, setting a strong foundation for the Explore and Summarise phases that follow.

Key takeaways:

1. Ideas for engaging tasks with an authentic context.

2. Different approaches for modifying tasks.

3. Research and examples of student engagement when using problem solving tasks.

SESSION C: Thursday, 2pm-3pm (cont.)

C19 BRINGING TASKS TO LIFE: TIPS FOR EFFECTIVE PLANNING IN MATHEMATICS

Subthemes: Pedagogy, Leadership

Aylie Davidson, Deakin University
(F to Year 8)

In the busyness of day-to-day teaching, it is easy to get bogged down with finding the right task to use to teach mathematics. So much so, that once we find the task, we sometimes run out of time to actually plan the task. In this workshop, Aylie will offer tips and suggestions to enable teachers to pay attention to key aspects of planning. This includes spending a few minutes doing the task to consider: the range of student responses, the types of questions that will elicit students' thinking, and the pedagogies that will help students to notice and make sense of the mathematics that is the intended learning of the lesson.

Key takeaways:

1. Doing and discussing maths is key to effective planning.

2. Use colour to help students notice mathematics.

3. Use high-quality resources to find tasks to inform planning.

C20 VICTORIAN CURRICULUM V2.0 MATHEMATICS - AN OPPORTUNITY TO EXPAND MATHEMATICS CULTURE AND UNDERSTANDING

Subtheme: Curriculum

Geoffrey Menon, Camberwell High School
(Year 7 to Year 12)

Constructible geometry along with reasoning and proof are prominent inclusions in the Space strand of the Victorian Curriculum 2.0. This mathematics has a long and illustrious history in the Islamic world, and this provides wonderful opportunities for mathematical investigations, geometry workshops and the development of constructible geometry, sacred geometry and a transition to non-constructible geometries. This session will give a brief survey of the history and ideas, classroom activities, student research opportunities and references for further research.

Key takeaways:

1. There is a rich history of geometry and its development in history and many different cultures have contributed to this.

2. Experimenting with geometric structures provides a wonderful method for understanding geometric and associated mathematical ideas.

Remember: Bring pencils, paper and an open mind - there will be computer based demonstrations and descriptions of how to obtain, install and experiment with these tools.

FULL C21 MATHEMATICS WITH A PROBLEM-SOLVING APPROACH. COLLABORATE, INNOVATE, SHARE, ENGAGE!

Subtheme: Pedagogy

Karim Noura, Melbourne Polytechnic
(Year 7 to Year 12)

Join Karim's workshop to engage in collaborative problem-solving tasks designed to enhance the teaching and learning of mathematics. This session offers a unique opportunity to share your strategies and experiences with peers, fostering a community of practice aimed at refining and innovating educational methods. We will explore practical examples from real-life situations to make mathematics more relatable and impactful for students. Together, we will plan forward-thinking approaches to improve student engagement and outcomes in mathematics education. Don't miss this chance to contribute to and benefit from shared expertise and fresh perspectives.

Key takeaways:

1. Teachers will share various strategies and methods of handling and solving some non-routine mathematics problems.

2. Be inspired to share with your students why they are learning mathematics and why it is important.

3. Collaborate and network with peer and experts.

Remember: Pen, papers and calculator.

FULL C22 WRITING INVESTIGATION STYLE UNIT 3 AND 4 GENERAL MATHEMATICS SAC'S

Subtheme: Leadership

Michelle Galli and Ros Saul, Caulfield Grammar School (Year 11 to Year 12)

Despite transitioning to what we believed to be more open-ended, choice-based SAC's, we did not pass our VCAA Audit for General Mathematics Unit 3 last year. After much research, reviewing sample SAC's and VCAA resources, we started from the beginning. Many hours later and with much collaboration, we produced our own Unit 4 SAC's that passed the subsequent Unit 4 VCAA Audit. In this session, we will outline our journey to becoming VCAA compliant. We will share our Unit 4 Matrices SAC and marking rubric from last year and discuss our new process that we have used to produce our SAC's and rubrics for this year.

Key takeaways:

1. Learn how we write VCAA compliant SAC's.

2. Copy of a General Mathematics Matrices SAC and Rubric.

Remember: Access to Google Drive.

FULL C23 HOW TO USE DESMOS ACTIVITY BUILDER AS A FORMATIVE ASSESSMENT TOOL

Subtheme: Technology

Tran Trinh and Narcisa Corcaci, Suzanne Cory High School (Year 7 to Year 12)

This workshop is an introduction to DESMOS Activity Builder as a learning tool, that, when embedded into our teaching practice, could become an effective way to formatively assess students' knowledge, identify their misconceptions and promote collaboration. At the start, teachers will be shown how to set up a teacher account, add classes and assign activities to students. Various examples will be used to demonstrate different types of activities including free response, sketching and matching answers to questions. They will also be shown how to navigate through different features on DESMOS. Teachers will also be introduced to the basic principles of how to create customed activities for their students. This workshop is designed for teachers from grades 9 to 12. By the end of the session, participants will be able to identify and select appropriate activities and assign them to students. They will also understand how to monitor students' progress effectively.

Key takeaways:

1. Tool for formative assessment.

2. Tool to identify misconceptions.

3. Tool to promote collaboration.

Remember: We will be working on DESMOS activities so please bring a laptop/tablet. It'd be great if you could set up a DESMOS teacher account in advance. However, we will allocate time for people to do that at the start.

C24 INTEGRATING EIGENVALUES AND EIGENVECTORS INTO LINEAR TRANSFORMATION EDUCATION (PYTHON)

Subtheme: Technology

Robin Wang, The Centre for Higher Education Studies (CHES) (Year 11 to Year 12)

The linear transformations is a key component in VCE Specialist Mathematics Unit 1 and 2 curriculum, providing students with foundational knowledge in linear algebra and its applications. While eigenvalues and eigenvectors are typically not required, their introduction can significantly enrich students' understanding and appreciation of linear transformations. This proposal presents an innovative approach to teaching linear transformations with a specific focus on eigenvalues and eigenvectors. This method emphasises geometric interpretations of linear transformations. Visual aids and interactive exercises, created using Python programming, will be utilised to illustrate the effects by linear transformations. This approach not only aligns with educational standards but also makes abstract mathematical concepts more accessible and engaging. The session will include practical strategies for integrating eigenvalues and eigenvectors into existing curriculum, emphasising hands-on learning experiences. Participants will receive access to Python code that generates visual aids, enabling them to implement similar interactive learning activities in their classrooms.

Key takeaways:

1. Enhance understanding of linear transformations

2. Integration of visual and interactive learning tools

3. Promotion of computational thinking

SESSION C: Thursday, 2pm-3pm (cont.)

C25 TRANSFER GOALS: INTERACTIVE MATHS WITH TI-NSPIRE, ROVER INNOVATOR

Subtheme: Technology

Jayaseelan Durairaj, Canadian International School, Bangalore, India
(Year 7 to Year 12)

In this session, we delve into how technology transforms mathematics education by leveraging TI-Nspire, GDC and the TI Rover Innovator to transfer essential skills. These tools empower students to apply theoretical knowledge to practical, real-world contexts, enhancing their application of knowledge, problem-solving skills, and interdisciplinary understanding. From Year 6 to Year 12, educators will explore strategies to integrate graphing software effectively, fostering a deep comprehension of functions and modelling. The TI Rover Innovator exemplifies this integration by enabling students to implement mathematical principles in real-time scenarios, promoting engagement and motivation through hands-on activities. This approach not only makes learning enjoyable but also equips students with critical skills necessary for future academic and professional success. Discover how these innovative technologies can revolutionise mathematics teaching, preparing students to excel in an increasingly complex world.

Key takeaways:

1. Enhanced Conceptual Understanding

2. Utilise TI-Nspire and TI Rover Innovator to deepen student comprehension of functions and modelling.

3. Real-world application: Implement mathematical principles with the TI Rover Innovator, fostering problem-solving skills.

Remember Participants are encouraged to bring their TI-Nspire graphing calculators to fully engage in the hands-on TI Rover Innovator activities planned for the session.

C26 WORTHWHILE CAS USE IN THE 2024 MATHEMATICAL METHODS EXAM 2

Subtheme: Technology

Kevin McMenamin, Mentone Grammar
(Year 9 to Year 12)

Routine and clever use of the CAS calculator in previous years of the Mathematical Methods Exam 2 has shown it to be advantageous and worth the time and effort in getting to know how it works. 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 notes will include both TI-Nspire and Casio ClassPad screen shots and the Casio ClassPad will be the featured CAS.

Key takeaways:

1. Familiarisation with an approved CAS technology.

2. Applications of CAS functionality to questions contained in a VCAA Examination.

3. Exposure to efficient approaches to solve and investigate questions thorough the use of a CAS technology.

Remember Bring along your preferred CAS calculator to have the opportunity to try some of the presented applications.

C27 STRENGTHENING CONNECTIONS AND UNDERSTANDING - LINEAR FUNCTIONS AND MODELS

Subtheme: Pedagogy

David Leigh-Lancaster, Leigh-Lancaster Consulting
(Year 7 to Year 12)

Linear functions are a fundamental type of function studied in detail throughout secondary school, Years 7-10, and yet many learners struggle with various aspects of them even at VCE. How might we address this? This interactive session will engage participants with a range of activities and approaches that can be used to enable students to progressively build their understanding, make connections and develop their skills in working with linear functions and models from Year 7 through to VCE.

Key takeaways:

1. A progression of key concepts, skills and processes for learning about linear functions and modelling across Years 7 – 10.

2. An approach to the integrated use of numerical, graphical and algebraic representations for linear functions.

3. A collection of related activities and resource links.

Remember: Participants should bring along technology with a graphing application (e.g. Desmos, Wolfram Alpha, GeoGebra, Excel) or a graphics/CAS calculator.

CANCELLED C28 PEARSON MATHEMATICS – POWERED BY TEACHING HUB, WRITTEN FOR VICTORIAN CURRICULUM

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Lindy Sharkey and Julian Lumb, Pearson
(Year 7 to Year 10)

In this session, as well as exploring the new Pearson Mathematics, you will also get a sneak peek at the corresponding Student Companion and our new, one-of-a-kind digital product: Pearson Secondary Teaching Hub. This platform has been designed to simplify teaching and energise learning, offering a flexible collection of digital topics and lessons, all with the peace of mind that our content has been written, specifically for the new Victorian Curriculum V2.0, by experienced teachers, to support the Victorian Teaching and Learning Model.

In this session we will:

- demonstrate how the model supports both guided and independent practice with purposeful opportunities for immediate feedback and updates on student progress.
- outline the relationship between print and digital resources to give you the flexibility to provide the perfect balance of online and offline learning.
- share strategies designed to support differentiated learning to cater for the mixed ability needs in your classroom.

Key takeaways:

1. Quality resources written to the Victorian Curriculum 2.0 by local experienced teachers.

2. Designed to support you to deliver the Practice Principles, Pedagogical Model and High Impact Teaching Strategies as outlined in the Victorian Teaching and Learning Model.

3. Supporting you to teach your way!

SESSION D: Thursday, 3.10pm-4.10pm

TOPIC DISCUSSION GROUPS

Join an engaging discussion group, where you'll gather to share knowledge, experiences and resources on a specific topic (see list below).

You'll be encouraged to actively contribute and collaborate, fostering a supportive environment and build valuable networks. The group will be facilitated to ensure productive discussions, with a strong focus and set questions provided to guide the conversation.

These discussion groups promise to be a dynamic and enriching experience, offering a unique opportunity to connect with peers and enhance your professional community.

D01 CURRICULUM – IMPLEMENTATION OF VC 2.0 (F –2)

D02 CURRICULUM – IMPLEMENTATION OF VC 2.0 (3- 6)

FULL D03 CURRICULUM – IMPLEMENTATION OF VC 2.0 (7- 10)

FULL D04 MATHEMATICAL MODELLING (PRIMARY)

D05 MATHEMATICAL MODELLING (SECONDARY)

D06 BUILDING TEACHING NETWORKS BETWEEN PRIMARY AND SECONDARY SCHOOLS INCLUSIVE OF TRANSITION. (PRIMARY)

D07 BUILDING TEACHING NETWORKS BETWEEN PRIMARY AND SECONDARY SCHOOLS INCLUSIVE OF TRANSITION. (SECONDARY)

D08 BUILDING TEACHING NETWORKS BETWEEN PRIMARY AND SECONDARY SCHOOLS INCLUSIVE OF TRANSITION. (F-12)

D09 EVIDENCE-BASED INSTRUCTIONAL MODELS (PRIMARY)

D10 EVIDENCE-BASED INSTRUCTIONAL MODELS (SECONDARY)

D11 VCE AND VM TEACHING, LEARNING AND ASSESSMENT 2025 (FOUNDATION)

D12 VCE AND VM TEACHING, LEARNING AND ASSESSMENT 2025 (GENERAL)

D13 VCE AND VM TEACHING, LEARNING AND ASSESSMENT 2025 (METHODS)

FULL D14 VCE AND VM TEACHING, LEARNING AND ASSESSMENT 2025 (SPECIALIST)

D15 VCE AND VM TEACHING, LEARNING AND ASSESSMENT 2025 (VM)

D16 EFFECTIVE ASSESSMENT PRACTICES (F-2)

D17 EFFECTIVE ASSESSMENT PRACTICES (3-6)

FULL D18 EFFECTIVE ASSESSMENT PRACTICES (7-10)

D19 LEADERSHIP - MATHEMATICS AND NUMERACY (PRIMARY)

D20 LEADERSHIP - MATHEMATICS AND NUMERACY (SECONDARY)

D21 MATHEMATICAL WELLBEING – SUPPORTING STUDENTS AND TEACHERS WITH MATHEMATICAL ANXIETY. (PRIMARY)

D22 MATHEMATICAL WELLBEING – SUPPORTING STUDENTS AND TEACHERS WITH MATHEMATICAL ANXIETY. (PRIMARY)

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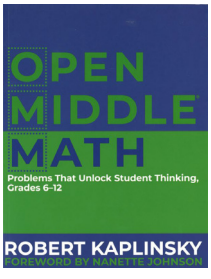
ALL STUDIES	$140.20 (MEMBER) $175.25 (NON MEMBER)
INDIVIDUAL STUDIES	$60 (MEMBER) $75 (NON MEMBER)
FOUNDATION	$30 (MEMBER) $37.50 (NON MEMBER)



OPEN MIDDLE MATH

6 -12

Robert Kaplinsky brings his new class of tasks designed to stimulate deeper thinking and lively discussion among high school students in *Open Middle Math*.

The problems are characterised by a 'closed beginning,' meaning all students start with the same initial problem, and a 'closed end,' meaning there is only one correct or optimal answer. The key is that the middle is 'open' in the sense that there are multiple ways to approach and ultimately solve the problem. These tasks have proven enormously popular with teachers looking to assess and deepen student understanding, build student stamina, and energise their classrooms.

Open Middle Math is an indispensable resource for educators interested in teaching student-centered mathematics in middle and high schools consistent with the national and state standards

$48.15 (MEMBER)
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2024 | ALL STUDIES

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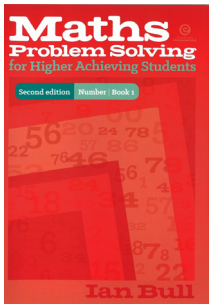
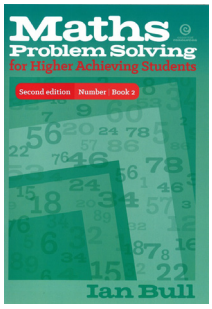
ALL STUDIES	$625 (MEMBER) $781.35 (NON MEMBER)
INDIVIDUAL STUDY	$240 (MEMBER) $300 (NON MEMBER)
FOUNDATION (EXAM 1)	$120 (MEMBER) $150 (NON MEMBER)





MATHS PROBLEM SOLVING FOR HIGHER ACHIEVING STUDENTS

7 -10

These books provide introductory lesson tasks and offers enrichment and extension activities for higher achieving students to work above and beyond the normal mathematics curriculum and develop their higher-order thinking skills. Each book contains three sections: the first takes a scaffolded approach with three levels of instruction; the second encourages students to think broadly to solve open-ended problems, recognising that any such problem has more than one possible answer; and the third presents general word problems to build on and reinforce the link between literacy and problem solving. Detailed solutions are included. Book 1 (red) and 2 (green) are sold separately.

$43.80 (MEMBER)
$54.75 (NON MEMBER)

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SESSION DETAILS

FRIDAY

6 December 2024

KEYNOTES: Friday, 9.15am-10.15am

KF01 I THINK I ALREADY DO SOME OF THAT?': NOTICING THE NOW AND FRAMING THE FUTURE OF CLASSROOM PEDAGOGY

Subtheme: Pedagogy

Katherin Cartwright, The University of Sydney
(F to Year 2)

In this keynote Katherin will discuss classroom teaching practices and pedagogies that are drawn from research and classroom experiences. She will share pedagogical moves that support students' mathematical proficiencies and present research related to effective pedagogies including an embodied approach to teaching mathematics in the early years.

Key takeaways:

1. Small pedagogical changes can make huge differences.

2. The development of quality pedagogical practices come from both research and the classroom.

3. Using a variety of representations in the mathematics classroom supports students future learning.

KF02 COMPUTATIONAL THINKING: WHAT'S NEW AND WHERE TO START IN YOUR PRIMARY MATHEMATICS CLASSROOMS

Subtheme: Curriculum

Jodie Miller, University of Queensland
(Year 1 to Year 6)

Computational thinking (CT) has emerged as a critical 21st century skill, prompting its integration into educational curricula worldwide. For many educators, CT represents a novel concept as they navigate ways to nurture students' CT capabilities through the application of its key components: decomposition, abstraction, pattern recognition, use of models and simulations, algorithms, and generalizations. In this presentation, we delve into evidence based practices related to CT activities within primary mathematics. Jodie, through her research with primary school students engaged in a CT project, will share insights and practical implications for fostering both mathematical knowledge and computational thinking simultaneously.

Key takeaways:

Computational thinking can be integrated into primary mathematics classroom to develop mathematical concepts as well as foster deep thinking skills.

FULL KF03 NAVIGATING PRESSING ISSUES IN SECONDARY SCHOOL MATHEMATICS EDUCATION

Subthemes: Pedagogy, Wellbeing, Leadership

James Dann, Brighton Grammar, Julia Hill, University of Melbourne, Mark McLay, Country Education Partnerships, Rohani Mohamad, Minaret College, Kerryn Sandford, Heathmont College
(Year 7 to Year 12)

In this panel presentation, we will address the pressing issues faced by mathematics teachers in 2024 and beyond. Our panel, comprising leaders, academics, and teachers from various sectors, will share and discuss a broad spectrum of ideas and strategies.

Topics will range from curriculum-based resources and innovative pedagogies to addressing teacher needs and promoting strong practices of well-being. We will explore the role of effective leadership in education and discuss solutions to solve current challenges.

By bringing together diverse perspectives and expertise, this discussion aims to provide actionable insights and foster a collaborative approach to advancing mathematics education in the years to come.

Key takeaways:

1. Delegates will benefit from a wide range of ideas and strategies shared by leaders, academics, and teachers, covering curriculum-based resources, innovative pedagogies, and effective leadership in mathematics education.

2. Practical insights into addressing the needs of mathematics teachers, with a focus on promoting strong practices of well-being and creating supportive teaching environments.

3. Participants will be equipped with actionable solutions to tackle current challenges in mathematics education, fostered by the collaborative discussion and diverse perspectives presented by the panel.

FULL KF04 MATHEMATICAL MODELLING IN THE VICTORIAN CURRICULUM: MATHEMATICS V2.0

Subthemes: Curriculum, Pedagogy, Wellbeing

Jill Brown, Deakin University
(F to Year 10)

Mathematical modelling is the process of solving real-world problems. Whilst mathematical modelling has always been part of mathematics, including in the Victorian Curriculum, there is an increased emphasis in the new curriculum (i.e., VC2).

Learning in Mathematics (V2.0) includes the four proficiencies (understanding, fluency, reasoning, and problem-solving) all of which include explicit aspects of mathematical modelling. In addition, for the new curriculum Learning in Mathematics (V2.0) also includes four processes. The processes refer to the thinking, reasoning, communicating, problem-solving and investigation skills involved in working mathematically. The four processes are mathematical modelling, computational thinking and simulation, statistical investigation, and probability experiments and simulations.

In this keynote, Jill will unpack the processes of mathematical modelling. When engaged with mathematical modelling students work together and make decisions about real-world problems. Seeing the usefulness of mathematics in solving real-world problems increases student motivation and engagement. A range of mathematical activities can be used between stages of the modelling process - these will be discussed and illustrated via a diagram of the mathematical modelling cycle. Jill will discuss how mathematical modelling might change what teachers and students are doing in the classroom.

Key takeaways:

This keynote will help teachers consider what mathematical modelling will look like in practice in their classroom or school.

KF05 SUPPORTING OUR TEACHERS AND STUDENTS INTO THE FUTURE: VALUING THE VALUE OF VALUES (F – Y12)

Subthemes: Pedagogy, Wellbeing

Wee Tiong Seah, University of Melbourne
(F to Year 12)

Mathematics learning is most effective when teachers' excellent teaching of mental processes and nurturing of affective states are accompanied by students' motivation and 'want to learn'. What students find important personally – that is, value – in their mathematics learning determines the strength of this motivation. In this session, we will look at how questions like 'why do we have to learn this mathematics?', strong teacher-student relationships, proficiency in mathematics, mathematical wellbeing, and some countries' persistent domination of international league tables can be better understood from a values perspective. We will also discuss how teachers can foster in students enabling values relating to mathematics learning.

Key takeaways:

1. Mathematics learning is a function of mental processes, emotional regulation, and value motivations.

2. Our professional practice is value-laden, though we may not be aware of the valuing we model or the values we instil amongst our students with regards to mathematics learning.

3. In the Australian Curriculum, proficiency in mathematics represents four values embraced by the learning area.

4. The quality of one's mathematical wellbeing is related to the extent to which certain values are fulfilled in mathematics education.

This keynote presentation is supported by

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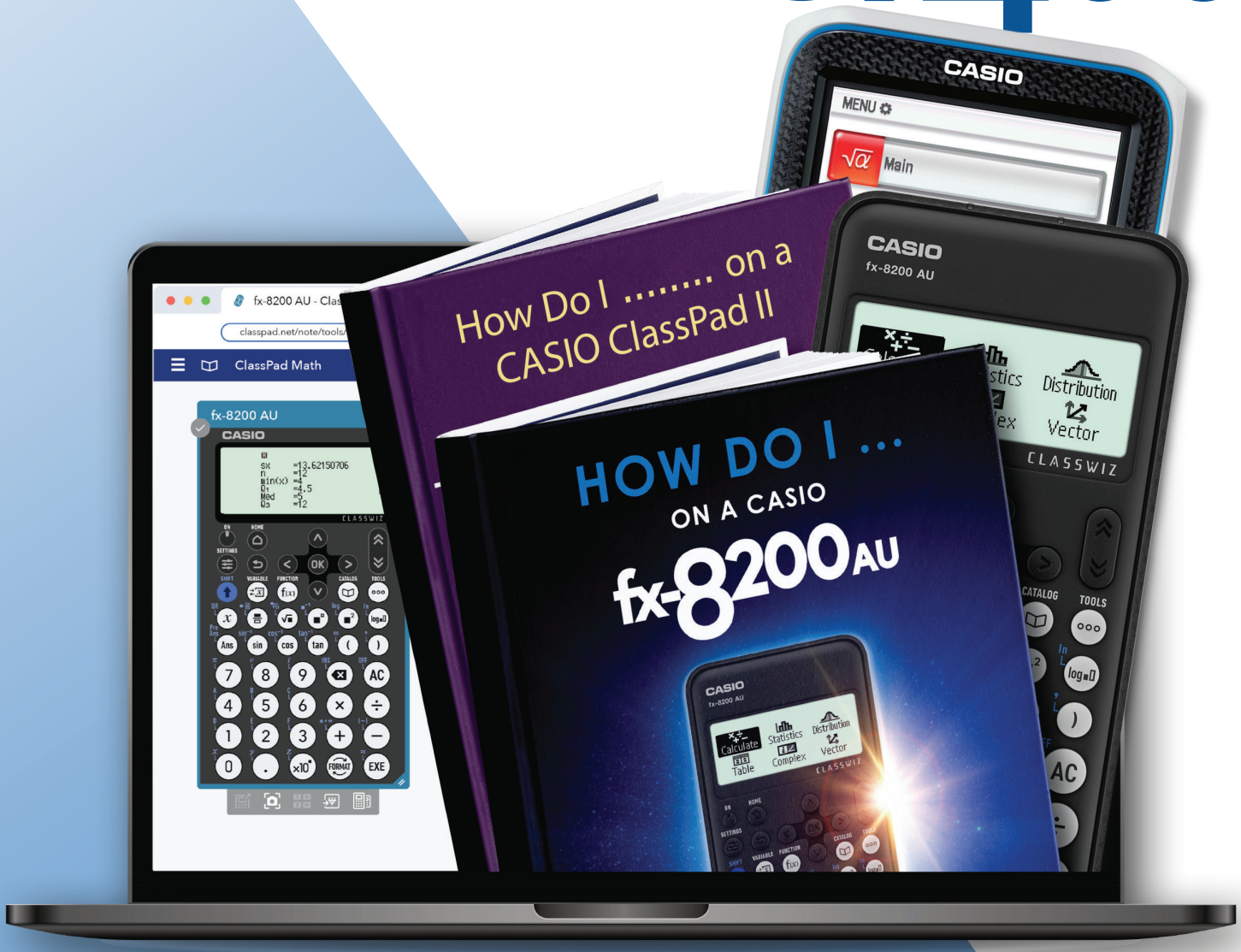

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CASIO EDUCATION

SESSION E: Friday, 11am-12pm

E01 BIG IDEAS AND VICTORIAN CURRICULUM: BUILDING A SCOPE AND SEQUENCE

Subtheme: Curriculum

Renee Ladner, The Mathematical Association of Victoria

(F to Year 6)

Students and teachers alike need to feel confident in seeing and making connections across all areas of the mathematics. Building correlations between the Big Ideas and the content descriptions of the Victorian Curriculum V. 2.0 will help schools build a scope and sequence set perfectly for each year level giving a very clear trajectory of development from F-6. This session will look at mapping out the revised curriculum and aligning them with the Big Ideas, to promote a movement away from teaching in solitary units and thinking deeply about the 6 domains. We will reflect on schools that have used this approach and highlight how it has affected their planning this year.

Key takeaways:

1. A clear guide to help leaders and teachers move away from 'silo' teaching.

2. A trajectory of learning, emphasising the key role each year level has.

3. A whole school approach to ensure there is a consistency and depth to teaching.

Remember: This will be a hands on session, please come prepared to engage with others.

CANCELLED E02 HOW MOI GROWTH POINTS CAN GUIDE YOUR TEACHING EFFECTIVELY.

Subtheme: Pedagogy

Donna McNeight, Wendouree Primary School
(F to Year 4)

The data from the Mathematics Online Interview can provide direction for future learning. See how to use the growth points for planning, explore activities to support learning and assess to decide next steps. I completed a project using a research grant where the growth points were used to plan and guide my teaching across a range of year levels. A part of the project involved connecting the MOI data with elements from the Extending Mathematics Understanding (EMU) Program to provide small group and whole class support. Come and look at documents created for planning and assessment. Discuss some activities used, evaluate the success achieved by the students, and experiment with the checklists that were created to monitor the students' achievements. Come to this informative session and see how the MOI growth points can guide your teaching and student's learning across all year levels.

Key takeaways:

1. How important the data from the MOI interview is.

2. How the teacher can plan and direct their teaching using the MOI data.

3. The importance of the activities and assessment that the teacher uses.

E03 I'D LIKE TO DO MORE OF THAT, BUT WHAT DOES IT LOOK LIKE IN PRACTICE?

Subthemes: Curriculum, Pedagogy

Katherin Cartwright, The University of Sydney
(F to Year 2)

This workshop builds on Katherin's keynote and relates to creating classrooms that are rich with teachers and students using embodied learning practices and representations to think and communicate mathematically. Katherin will share examples of what these researched pedagogies look like in lesson activities for mathematical concepts such as representing numbers, working with additive strategies, and spatial thinking and reasoning. Participants will engage in these activities and work collaboratively with other participants, snowballing and sharing other ideas and ways to embed embodied learning and representations into their classroom mathematics lessons.

Key takeaways:

1. Collecting ideas to support students in thinking and communicating mathematically through the use of embodied learning and representations.

2. Knowledge of how an embodied learning approach allows students to experience the processes of mathematics for themselves.

3. Understanding that the use of representations in mathematics provides a variety of avenues for students to share their thinking and conceptual understanding.

SESSION E: Friday, 11am-12pm (cont.)

E04 ENGAGING INTERVENTION IN THE PRIMARY YEARS

Subtheme: Wellbeing

Amy Somers, Westall Primary School
(F to Year 6)

In this session we will share what we have been doing at Westall Primary School to create a safe, engaging and rich experience for our students in Tier 2 intervention. Students love coming to these sessions, ask to come along to extra sessions and even ask to stay in during their breaks to finish off their work. In this session we will look at the steps we took to create this culture and will share resources that you could use in your own school setting.

Key takeaways:

1. Building relationships to promote student learning.

2. Using problem solving in intervention groups.

3. Making fluency fun.

E05 LI + SC = CLARITY

Subtheme: Leadership

Paul Staniscia, Southern Cross Grammar
(F to Year 6)

Teacher clarity plays a pivotal role in the teaching and learning of mathematics, in every single lesson. This clarity comes in multiple forms:

- clarity of organisation of our classrooms.
- clarity of explanations of learning experiences and strategies.
- clarity of examples and guided learning experiences.
- clarity of assessment.

This clarity cannot exist without clear and specific Learning Intentions with well-crafted success criteria. This workshop will highlight the importance of Learning Intentions and success criteria and their role in developing clarity for all. Participants will explore ways to develop collaborative structures to facilitate impactful planning sessions, design appropriate learning progressions and identify clear and specific learning intentions. They will explore the design principles in crafting relevant success criteria, closing the loop on effective clarity development.

Key takeaways:

1. Identify learning progressions based on a strategy approach.

2. Develop learning intentions that follow the development of learning.

3. Collaboratively craft success criteria that allow teachers to articulate what students are learning, why they are learning it and how they know they have learned it.

E06 FIVE TYPES OF WHOLE-CLASS MATHS GAMES TO ENGAGE STUDENTS

Subtheme: Pedagogy

James Russo, Monash University, Toby Russo, Fitzroy North Primary School
(F to Year 6)

Are you a primary school teacher who is interested in using maths games to support instruction? Have you ever wondered why it is that specific game types, 'work' in a whole-class context, whilst other games are less effective in engaging students? Or why it is that some games seem to sustain student mathematical thinking and reasoning for the entire duration of game-play, whereas others only do so sporadically? In this workshop, we will unpack five different types of whole-class mathematical games that are potentially available to teachers. Through being explicit about the mechanics that characterise each type of game, we aim to support teachers and mathematics leaders to contemplate the affordances and constraints of particular game types, Ultimately, we hope to empower teachers to become more deliberate in their choice of game for use in a given context.

Key takeaways:

1. An understanding that the specific mechanics of a given game are integral to the available opportunities to engage students in deep mathematical thinking.

2. Knowledge of five different game mechanics, as well as experience playing five exemplar games, each of which matches one of these mechanics.

E07 ILLUSTRATIONS OF IMPACT: HOW CONSOLIDATING TASKS ENHANCE STUDENT LEARNING AND ENGAGEMENT.

Subtheme: Pedagogy

Michael Cini and Alana Bandholz, Brisbane Catholic Education
(F to Year 6)

An important consideration in teaching challenging tasks is the intentional positioning of consolidating tasks, which give students opportunities to clarify thinking and build connections in the mathematics classroom. Our work in Brisbane Catholic Education primary schools supported the implementation of sequences of challenging tasks. Through this, we observed the impact of consolidating tasks on students' learning outcomes, engagement, and self-efficacy, as well as on teachers' reflective practice. In this session, we will share evidence of the impact of this work on student progress and discuss how this approach can build engagement in a primary mathematics classroom.

Key takeaways:

1. How teachers are intentionally sequencing consolidating tasks for impact.

2. The challenges faced by teachers and how these are being overcome.

3. Reflections and learnings from teaching with consolidating tasks that maximise mathematical learning. Illustrations of impact will be shared.

E08 AN EXPLORATION OF TEACHING MATHEMATICS THROUGH PROBLEM-SOLVING

Subtheme: Pedagogy

Donna Guise, Western Sydney University
(Year 3 to Year 6)

With so much research available to mathematics teachers about pedagogy it is important that knowledge translation allows theory to have a positive impact on practice. This workshop will identify issues related to the implementation of problem-solving in the primary mathematics classroom. Participants will explore problem-solving implementation findings from the presenter's research study conducted in two upper primary classrooms and will be encouraged to share their views and problem-solving experiences.

During the workshop participants will gain further understanding of the implementation of teaching mathematics through problem-solving in the primary mathematics classroom.

Key takeaways:

1. The more explicit teaching occurs later within a mathematical lesson structure and the more there is an increased focus on mathematical process outcomes, the more space is created for teaching mathematics through problem-solving and for further student autonomy, competence, and relatedness opportunities.

E09 EMBEDDING WELLBEING IN THE MATHS CLASSROOM: PRACTICAL STRATEGIES

Subtheme: Wellbeing

Justine Sakurai and Julia Hill, University of Melbourne
(F to Year 12)

This highly practical session explores the integration of wellbeing into mathematics education, emphasising numeracy's role in human flourishing. We'll examine how numeracy extends beyond traditional mathematics, influencing success across various life domains. Participants will learn classroom ready strategies to make numeracy and maths education more relevant, engaging, and accessible, for all students. We'll discuss shifting from narrow, subject-focused mathematics to a broader numeracy approach connecting mathematical skills to real-world applications. The session will explore a strengths-based vision of numeracy and maths education to address negative perceptions of mathematics and disengaging behaviours. This session aims to equip you with some accessible tools and strategies to enhance maths wellbeing in the classroom.

Key takeaways: 1. Practical and accessible strategies for embedding wellbeing in F-12 classrooms.

2. A strengths-based approach aiming to make numeracy and maths education more relevant, engaging, and accessible for all students.

3. Promoting wellbeing through broadening mathematics education to practical numeracy skills applicable across life domains.

Remember: Please bring curiosity about the intersection of maths and wellbeing.

SESSION E: Friday, 11am-12pm (cont.)

E10 BUILDING THINKING CLASSROOMS - WHAT I WISH I KNEW EARLIER

Subtheme: Pedagogy

Lorna McClory, Bacchus Marsh College, Penne Grant, Mount Rowan Secondary College
(Year 5 to Year 12)

This session will focus on implementing pedagogy discussed in the book *Building Thinking Classrooms* by Peter Liljedahl. Information will be provided around first steps on implementing the toolkits of a thinking classroom, with reflections on the journey of two teachers in a secondary school. Participants will be given practical advice on considerations to be made when starting to move students from mimickers to thinkers. Authentic tasks will be run using the BTC model to give participants a taster of teacher and student moves that will support successful change in practice.

Key takeaways:

1. What is the BTC model?

2. Key steps in implementing the 4 toolkits.

3. The importance of building classroom culture.

FULL E11 UNPACKING THE VICTORIAN CURRICULUM MATHEMATICS 2.0 FOR SUCCESSFUL IMPLEMENTATION

Subtheme: Curriculum

Crystal Afitu, Zahara Forte and Lee Gianfriddo, The Victorian Curriculum and Assessment Authority (VCAA)
(F to Year 10)

The session will begin with a comprehensive overview of the Mathematics Curriculum version 2.0, highlighting its key features and innovations. We will examine the curriculum's emphasis on mathematical proficiencies (Fluency, Understanding, Reasoning, and Problem-Solving) and processes (mathematical modelling, statistical investigations, algorithmic and computational thinking, and probability experiments).

We will explore the Digital Assessment Library (DAL), a free online resource supporting curriculum planning, implementation, assessment and reporting. We demonstrate how to interpret and measure student outcomes and adapting teaching methods using DAL and authentic case studies with an interactive discussion adaptable to any school setting.

The session will conclude with a reflective discussion, allowing participants to share insights and plan their next steps in implementing the Mathematics Curriculum version 2.0.

Key takeaways:

1. A comprehensive understanding of the Mathematics Curriculum version 2.0

2. Utilising the Digital Assessment Library (DAL): Practical demonstrations to show how to interpret student outcomes and adapt teaching methods using DAL.

3. Interactive and reflective discussions: Participants will engage in interactive discussions that can be adapted to any school setting.

Remember: Laptop (optional).

E12 FACILITATING STUDENTS' EMBRACING OF VALUES IN THE MATHEMATICS CLASSROOM: THE JEDI APPROACH

Subtheme: Pedagogy

Wee Tiong Seah, Faculty of Education, The University of Melbourne
(F to Year 12)

While the benefits and significance of students' valuing in mathematics learning may be obvious to many stakeholders, it remains tricky for teachers to facilitate students' embracing of empowering or enabling values. Values often take a long time to be internalised. In this workshop, delegates will be introduced to the JEDI approach to values development, in which the acronym stands for Justifying – Essaying – Declaring – Integrating. The psychological basis of this approach will be outlined. Participants will also have the opportunity to experience the JEDI process themselves during the workshop.

Key takeaways:

1. Classroom (mathematics) teaching is value-laden.

2. Values can be developed amongst students within an hour or so.

E13 BOOSTING ENGAGEMENT AND SOCIAL SKILLS THROUGH COOPERATIVE LEARNING

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Joanna Tutos, The Education Advantage
(Year 5 to Year 8)

Humans naturally thrive when reasoning and learning from each other, and this approach can be particularly effective in the mathematics classroom, where students bring diverse learning styles, skills, and ability levels. Encouraged by their peers, students become more engaged in activities, leading to more efficient learning and enhanced social interaction skills. By fostering a collaborative environment, students not only achieve academic success but also develop critical social skills, preparing them for future interactions both inside and outside the classroom. This session explores practical ideas for group collaboration, presenting learning activities and resources that promote teamwork while recognising individual efforts. Join us as we delve into strategies for an effective collaborative learning.

Key takeaways:

1. Collaborative learning emphasises the importance of working together toward a shared goal while acknowledging individual contributions and achievements.

2. Achieving a goal as part of a team is a rewarding experience.

3. The ability to work in a team is a powerful predictor for success in the workplace.

E14 LEARNING THE LANGUAGE OF MATHS: UNLOCKING TRUTHS THOUGH WORD ORIGINS

Subtheme: Pedagogy

Emily Peterson, Mathematical Association of Tasmania
(Year 5 to Year 10)

For our students, learning maths can feel like learning a foreign language. Why exactly is mathematical vocabulary so baffling? Because it's drawn from multiple ancient languages. Never fear! There's a lot that you can do to empower your students as they learn the language of mathematics. For example, unpacking the word 'square' and it's Latin root 'quadrare' will empower your students to better understand quadrilaterals and quadratics later on in their studies.

Key takeaways:

1. Mathematical vocabulary is a foreign language, and we need to explicitly teach it.

2. Exploring root words empowers our students.

3. There are several quick, easy ways to embed language instruction into our maths classrooms.

FULL E15 AI AND LESSON PLANNING: HELP OR HINDRANCE?

Subtheme: Technology

Scott Cameron and Carmel Mesiti, The University of Melbourne
(Year 3 to Year 12)

Do you want to learn more about how Generative Artificial Intelligence (GenAI) can be a helpful tool for lesson planning? Teachers draw on considerable expertise as they work to prepare teaching and learning materials for their classes. The recent launch of GenAI technologies raises the question 'how can GenAI support teachers in the challenging work of lesson planning?' This presentation explores the use of a GenAI tool, ChatGPT, to assist teachers in creating lesson plans. We will share a research-informed prompt and our analysis of GenAI developed lesson plans for the teaching of division of fractions. Our analysis of these GenAI developed lesson plans revealed that while they effectively identified key content areas, they lacked the detailed instructional practices needed for meaningful teaching. Join us to discuss how AI can be a helpful tool in lesson planning and where it currently falls short.

Key takeaways:

1. Develop skills for writing prompts for GenAI tools.

2. Consider efficiency of using GenAI tools for lesson planning.

3. Develop criteria for analysing GenAI lesson plans.

Remember: You may wish to have an access to a GenAI tool for this session (e.g., ChatGPT, Google Gemini, Microsoft Copilot, etc).

SESSION E: Friday, 11am-12pm (cont.)

E16 INQUIRY IN MATHEMATICS - WHAT IS IT REALLY?

Subtheme: Pedagogy

Kristen Tripet, Australian Academy of Science
(F to Year 10)

Mathematical inquiry or mathematical exploration is what mathematicians do. As Francis Su (2020), a past president of the Mathematical Association of America, pointed out, mathematicians are mathematical explorers: 'Exploration and understanding are at the heart of what it means to do mathematics'. The mathematics teacher plays a central role in this process as they select and use different pedagogical tools to guide students' mathematical inquiry. In this interactive presentation, I present the approach to mathematical inquiry developed by the reSolve team in collaboration with international researchers. Participants will explore the brand-new reSolve website and our new mathematical tasks structured around our approach to mathematical inquiry. Participants will also explore a pedagogical toolbox of strategies that they can use to support students' mathematical inquiry.

Key takeaways:

1. Pedagogical tools to support students' mathematical inquiry.

2. Exploration of the new reSolve website and tasks.

E17 MATHEMATICAL MODELLING IN THE NEW CURRICULUM

Subtheme: Curriculum

Jill Brown, Deakin University
(Year 5 to Year 8)

Mathematical modelling is the process of solving real-world problems. Whilst mathematical modelling has always been part of mathematics, there is an increased emphasis in the new curriculum (i.e., VC2). This session will present some relevant mathematical modelling tasks. In addition, to discussing how students might solve the tasks, this session will focus on the teacher perspective. That is, what might mathematical modelling look like in practice in the classroom.

- What might the teacher be doing or saying at various stages of the lesson.
- What might the students be doing or saying at various stages of the lesson.
- How might students' progress their mathematical modelling capabilities with a year and over their years of schooling.

If you want your student to value mathematics and be motivated to learn mathematics, then you should be excited about the renewed opportunities to engage your students in the process of mathematical modelling.

Key takeaways:

1. Mathematical modelling tasks ready to implement in your classroom.

2. Better understanding of the process of mathematical modelling as real-world problem solving.

3. Increased motivation to implement mathematical modelling and an opportunity to collaborate with others.

Remember: Whist the focus in 5-8, the ideas in this workshop are relevant beyond these year levels.

FULL E18 PUZZLES, PROBLEMS AND TRICKS OF THE TRADE TO ENGAGE STUDENTS

Subtheme: Pedagogy

Mike Ristovsky and Taylor Pervan, Christ Church Grammar School
(Year 7 to Year 10)

It's not always easy to captivate kids in the mathematics classroom, but with some carefully crafted activities it is possible to get kids talking about the joys of mathematics that will allow teachers unique access to student thinking. This session will run through 8 of my favourite activities that I have accumulated over the past 30+ years of teaching secondary students in classroom settings. These activities have been chosen as they allow students to explore mathematics and make decisions and discoveries with the teacher acting as a facilitator. Participants will be guided through the activities at an easy pace, accessible to all. Handouts will be provided so the material can be used in classes on Monday morning.

Key takeaways:

1. A set of 8 problems/puzzles with solutions that can be used in a variety of class settings.

2. Strategies and approaches that will allow for student engagement in mathematics at a variety of levels.

Remember: Bring a pen/pencil, calculator (any type) but most importantly an inquisitive mind!

E19 ALL HIGH-CEILING, ALL KNOWING: HOW TO AVOID 'MATHEMATICS 2.0' BECOMING '2-POINT-OH-NO!'

Subtheme: Curriculum

David Innes, Evaluate forx
(Year 5 to Year 10)

It's that time again: to develop documentation for a new curriculum. Crossing the t's and dotting the i's can result in bland, procedural mathematics that checks more boxes than it does inspire. Students are engaged when they are curious and are motivated when they are rewarded for their efforts. A reliable method for engagement is by designing activities that are either open-ended or developed with a flow-floor high-ceiling mindset. In this session, experienced educator and consultant David Innes will present some of his favourite low floor high ceiling activities for a secondary mathematics classroom. You can create open-ended tasks without the dread of a pile of onerous marking. These activities will be a mixture of warm up, engage and explore activities, with potential formative assessments. Participants will have the opportunity to try them out during the session and will be shown how they line up with the new curriculum.

Key takeaways:

1. Learn first, rules after.

2. Less words, more mathematics.

3. Differentiation is easier when the prompts are open.

Remember: Bring paper, pens, calculator.

E20 FUN IN THE DIGITAL SPACE WITH GEOGEBRA

Subthemes: Technology, Curriculum

Marj Horne and Rebecca Seah, RMIT
(Year 5 to Year 8)

The Australian Curriculum requires the use of digital devices to explore problem solving and reasoning in mathematics. This workshop introduces a free, easy to use app, available on all platforms, Geogebra. It enables students to explore a range of ideas in geometry while it also is a computer algebra system. The purpose is to engage with the use of technology to support reasoning in geometry and measurement in the middle years paying particular attention to the development of angle. So, bring your laptop or tablet and come and have fun.

Key takeaways:

1. The use of dynamic geometry software

2. Appreciation of angle concept

3. Activities to support reasoning in middle years

Remember: Bring a laptop or tablet preferably with Geogebra Classic downloaded.

E21 KILLER GENERAL MATHS VCE QUESTIONS BY MAFFSGURU AND NELSON VICMATHS

Subtheme: Pedagogy

Darren Smyth, Melbourne Grammar School, Robert Yen, Cengage Australia
(Year 11 to Year 12)

MaffsGuru's Darren Smyth and VICmaths' Robert Yen review some complex questions from this year's and previous years' exams. Why did they kill? Was it the topic or the question? Hear some expert advice on reading and interpreting the questions, the common areas and errors, and the student performance for those questions. Learn some exam hacks for unpacking and tackling these questions.

Key takeaways:

1. Review some killer questions from this year's and previous years' exams.

2. Expert advice on reading and interpreting the questions, the common areas and errors, and the student performance for those questions.

3. Learn some exam hacks for unpacking and tackling these questions.

SESSION E: Friday, 11am-12pm (cont.)

FULL E22 SEQUENCES, PSEUDOCODE, AND PROGRAMMING USING TI-NSPIRE.

Subtheme: Technology

Raymond Rozen, Yeshivah College, Shane Dempsey, Hamilton College, James Mott, Southern Cross Grammar
(Year 11 to Year 12)

The sequence 1, 2, 3, 8, 15, 48, 105, 384, 945, 3840, ... captures a captivating pattern that intertwines concepts from Specialist Mathematics, including integration by parts and reduction formulae. This sequence serves as a rich context for exploration and discovery, and a simple yet rich context for engaging with pseudocode. In this session attendees will explore this interesting sequence and learn how to write a TI-Nspire function and a program to generate this and related sequences. Attendees are encouraged to bring a TI-Nspire CAS calculator or a laptop with TI-Nspire CAS software.

Key takeaways:

1. Programming using the TI-Nspire CAS calculator.

Remember: TI calculator, not Casio.

E23 CULTIVATING FLOW: ENHANCING ENGAGEMENT AND LEARNING IN SECONDARY SCHOOL MATHEMATICS

Subtheme: Pedagogy

Joel Pinto and James Dann, Brighton Grammar School
(Year 7 to Year 10)

Maths anxiety is at an all-time high. And according to a recent survey of 77 OECD countries, Australia ranks 70th for classroom disruption to learning. All students have the right to participate in high-quality classroom environments in which they can experience minimal disruption and a high level of engagement in their learning. With high engagement comes increased confidence in both their ability in maths and their ability to learn. We will present strategies and practices for fostering 'flow' in secondary school mathematics classrooms. Flow, a state of deep engagement and immersion in an activity, is a strategy for maximising student learning and focus. This presentation will explore the theoretical foundations and research related to flow, its relevance to secondary mathematics education, and practical methods for creating a classroom environment conducive to flow.

Key takeaways:

1. Understand the concept of flow, including its psychological underpinnings and significance in educational settings.

2. Identify flow Indicators in the context of secondary school mathematics classrooms.

3. Specific strategies and classroom practices that facilitate the emergence of flow during secondary school mathematics learning.

Remember: If your school has a lesson plan template, please bring a printout along or have access to it on a device.

E24 LEARNINGS FROM AN EARLY IMPLEMENTATION OF THE NEW VIC 2.0 MATHEMATICS CURRICULUM

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Cory Duker, Essendon Keilor College, Daniel O'Kane, Mathspace
(Year 7 to Year 10)

After fluctuating numeracy scores across recent years at Essendon Keilor College, Cory and the maths team made the bold decision to completely implement the new VIC Mathematics 2.0 curriculum as of Term 1 2024. As the school's Head of Mathematics Improvement, Cory will be sharing a little about his experience as a mathematics teacher. As well as what their school is doing to turn the tide. From playing maths games, to implementing the new Mathspace print and digital textbooks that align to the VIC 2.0 curriculum. Cory also invites workshop participants to join him in a 10-15 minute round-table discussion, so that others may also share their school's unique approaches to implementing the new VIC 2.0 curriculum.

Key takeaways:

1. Lessons learned from choosing to implement the new curriculum in 2024 instead of 2025.

2. 5 to 8 minute numeracy games to improve classroom engagement.

3. Why EKC chose to booklist Mathspace print textbooks and digital resources in 2024 for junior maths classes (Years 7 to 9).

E25 STEM ACTIVITIES IN ASTRONOMY

Subtheme: Technology

Stephen Broderick, St Ursula's College
(Year 9 to Year 12)

In this session, several STEM activities in astronomy will be presented. These activities use functions to model real world phenomena and include linear, quadratic, trigonometric and exponential. A TI-Nspire notes page will be used to enter and edit various functions. Some of the STEM activities include determining the length of daylight using a shadow stick at midday from any given latitude on Earth and approximating the distance to a galaxy using Cepheid variable stars. Students tend to develop a deeper understanding of mathematical concepts when they are rooted in real world modelling applications. Hopefully, these activities can empower students and foster a lifelong love of mathematical applications, hence promoting success and interest in related fields such as astronomy.

Key takeaways:

1. Technology can reveal hidden relationships within astronomical data sets.

2. Mathematical functions are useful for modelling astronomical phenomena.

3. Astronomy is an area of study that may be of interest to teachers and students.

Remember: TI calculator or Casio calculator may be useful in this session; although not a necessary requirement.

E26 ENHANCING MIDDLE YEARS NUMERACY: A STRENGTH-BASED PEDAGOGY

Subtheme: Pedagogy

Milton Bai, Kensington Community High School, Gloria Yi, St Albans Secondary College
(Year 7 to Year 10)

This session introduces an innovative pedagogy: the strength-based approach to enhancing numeracy in middle years. The approach was inspired by: Berry Street Education Model and strategies grounded in trauma-informed, strength-based education and positive psychology, which aimed at supporting all students, particularly the most vulnerable, and helping students to build their resilience, increase their motivation and engagement, and fulfil their full learning potential within the classroom. Emeritus Professor Peter Sullivan's research and workshop, which aimed at enhancing numeracy engagement by linking learning activities and assessments to real life, and in particular, students' daily life, and improving maths teaching efficiency by covering multiple strands within one unit. The approach is suitable for secondary and pre-VCE Vocational Major (VM) pathway students and has been applied and proven effective in secondary mainstream and especially in alternative settings. We will share our resources and demonstrate how to apply the approach at your school.

Key takeaways:

1. Introduction to an innovative teaching approach.

2. Discussions and resources of the approach and examples.

3. Opportunities to create programs for your school.

Remember: Hard copies and digital copies of handouts will both be provided. Please bring a pen and/or a charged device.

E27 CULTIVATING FINANCIAL LITERACY IN MATHS WITH INNOVATIVE TECHNOLOGY

Subtheme: Technology

Jason Jin
(Year 9 to Year 12)

This session dives into the practical integration of technology in the mathematics curriculum, emphasising the development of unit plans that incorporate digital tools for teaching financial maths. With the example of the Year 9 and Year 11 VCE General Mathematics curriculum, we will showcase a range of age-appropriate technologies, apps, and digital platforms.

These tools are selected for their proven effectiveness in engaging students with financial maths concepts and helping them apply these skills in real-world situations. We'll provide a detailed walkthrough of how these technologies can be embedded within unit plans, offering teachers hands-on strategies for crafting lessons that are not only educational but also highly engaging and relevant to students' lives.

By the end of this presentation, educators will have a clear understanding of how to build and implement technology-enhanced unit plans that make financial mathematics accessible and interesting to students across different year

levels. Jason, an accomplished educator with a Master's in Teaching from the University of Melbourne, has worked as a SAC Author and trial exam producer. He contributed to VCE materials widely adopted by schools in Victoria and China through the VCE in China program.

Key takeaways:

1. Practical technology integration, learn to embed tech tools in financial maths curriculum.

2. Building engaging unit plans, strategies for dynamic, tech-enhanced financial maths lessons.

3. Empowering real-world application, equip students with practical financial literacy through technology.

Remember: Digital technologies such as laptops or smart phones will be required to bring in this session.

E28 THE NOTES APPLICATION, WIDGETS AND MORE!

Subtheme: Technology

Chris Ireson and Len Bedier, Melbourne High School (Year 11 to Year 12)

In this session, participants will be shown how to use the functionality of the TI-Nspire™ CX CAS technology and the versatility of the Notes Application to create an amazing easy to use resource known as a Widget. Teachers and students can use Widgets to explore and help understand mathematical concepts and principles. Students can easily pre-prepare their own Widgets to efficiently solve typical exam questions. There will be a discussion about Widget construction and content, and participants will learn how to build and save their own Widgets. Participants will be provided with a number of Widgets to add to their 'MyWidgets' folder on the TI-Nspire™ CX or CX II CAS Calculator. This session will open up possibilities in all areas of the mathematics curriculum including VCE General Mathematics, Mathematical Methods and Specialist Mathematics.

Key takeaways:

1. Using technology to help understand mathematical concepts and principles, learning how to use the Widget CAS Calculator Application efficiently and writing Widgets to save time in solving typical exam questions.

Remember: Access to the TI-Nspire™ CX CAS Premium Teacher Software or the TI-Nspire™ CX or CX II CAS Calculator with up to date software is required to gain full value for this presentation. No prior experience assumed. The Casio ClassPad is not appropriate for this session. Suitable for students in Year 11 -12.

SESSION F: Friday, 12.10pm-1.10pm

F01 RICH MATHS THROUGH PICTURE STORY BOOKS

Subtheme: Curriculum

Marissa Cashmore, Motivating all Maths Learners to Succeed
(F to Year 6)

Children's literature is such a wonderful way to engage students in learning and using picture story books in mathematics is a clever pedagogy.

In this workshop, Marissa will share some of her favourite picture story books that are perfect for drawing out mathematical investigations, both explicitly and implicitly. We will look at planning using picture books, as well as how books can be used to initially engage students in mathematics but extend their critical and creative thinking and lead to further investigation of rich problem-solving tasks. Participants will then get the opportunity to look at a range of texts and delve into the potential mathematics within.

Key takeaways:

1. Ways to use picture story books as engaging hooks.

2. Immediate tasks to try.

3. Planning a maths lesson using a PSB.

F02 DYSCALCULIA AND SLDS - BRINGING EVIDENCE BASED PEDAGOGY INTO DAILY PRACTICE

(COMMERCIAL PRESENTATION)

Subtheme: Pedagogy

Esther White, Maths Australia
(F to Year 6)

Covering a review of cognitive load theory, explicit instruction, the 'Response to Intervention' model and 'Rosenshine's Principles of Instruction', this presentation will enable participants to see the simplicity of using a sequential, multi-sensory, mastery-based and student-paced approach to teaching maths as a language. With just one 'Integer Block Kit' to teach all whole number operations, and another 'Advanced Kit' to teach all fractions, decimals, percents and algebra, you'll experience the ease of simply 'counting and building rectangles' to teach maths. Through understanding the 'alphabet' and clear, accurate, dependable rules we have in maths, students learn to delight in this approach where they have confidence in the tool and the representation and can then simply learn to understand the language and application of maths with ease. You may even be amazed, yourself, at how simple maths actually is when we incorporate research and evidence-based pedagogy into practice!

Key takeaways:

1. Understanding cognitive load theory, 'Response to Intervention', 'Rosenshine's Principles of Instruction' and 'Explicit Direct Instruction' in relation to numeracy intervention.

2. Awareness of maths being a language that has its own set of symbols, and dependable rules.

3. Demonstration of using one tool to teach all whole number operations.

Remember: Bring colored pencils, paper, and any hands-on manipulatives that you currently use and would like reviewed in light of the needs of students with dyscalculia or other learning differences that.

F03 QUESTIONING AND DIALOGUE UTILISING VC2.0 MATHEMATICS CURRICULUM?

Subtheme: Curriculum, pedagogy, leadership

Leonie Anstey, The Mathematical Association of Victoria
(F to Year 5)

Do you wonder about how explicit teaching in the mathematics classroom, relates to the importance of questioning and dialogue? Do you ponder how questioning techniques can build feedback and assessment related to the curriculum achievement? This session will use practical hands-on examples related to concepts of rational number and number properties.

CANCELLED F04 MATHEMATICS AS A SOURCE OF LEARNING AND WELLBEING IN PRIMARY

Subtheme: Wellbeing

Lauren Field, Mirripoa Primary School
(Year 3 to Year 6)

We will explore connections between challenging mathematical tasks-in-practice, the proficiencies of reasoning

and problem solving, teacher pedagogy, and several of the High Impact Wellbeing Strategies featured in the Victorian Teaching and Learning Model 2.0. A recent overnight Maths Camp with 10 students at Mirripoa Primary School, one of the schools supported by the PMSS 2-year professional learning initiative, provides the setting for our guiding question. The Maths Camp was chosen because it offers a means of considering a broader school improvement effort in mathematics at Mirripoa, supported by PMSS, through the lens of one teacher, her developing pedagogical practice and a small number of students.

F05 A SHARED VISION AND UNDERSTANDING FOR LEADING MATHEMATICS

Subtheme: Leadership

Vanessa Grossi and Molly-Rose Clifton-Williamson, Deer Park North Primary School
(F to Year 6)

Middle leaders, Molly and Scott will share the journey of how the team of middle leaders created consistency through the development and implementation of our mathematical instructional model. Join us as we discuss how to lead from the middle to strive for consistency for numeracy teaching and learning. Staff at Deer Park North had been on a 2-year journey, reflecting on the roles of the teacher and student in maths lessons. This professional learning challenged the mindsets and experiences of teachers, and the resulting reality was a wide variance in the implementation of our agreed pedagogy. Join our presentation to hear about steps taken to ensure formalised consistency of planning documentation and lesson delivery across our staff community, which was a focus of both our professional learning journey and coaching.

Key takeaways:

1. What to prioritise to ensure consistency.

2. Strategies to engage staff.

3. Strategies to engage the parent community.

CANCELLED F06 EMPOWERING ADDITIVE THINKERS: DEBUNKING THE SUBTRACTION MYTH

Subtheme: Pedagogy

Cathy Azzopardi and Laura deKretser, NSW Department of Education
(F to Year 6)

Join us for an empowering workshop that challenges the misconception that subtraction is harder than addition. Discover the dynamic relationship between these operations and equip yourself with evidence-based strategies to deepen students' understanding. We'll delve into practical tasks that you can implement immediately, integrating tools and models to boost student confidence in both subtraction and addition. By emphasising key language considerations and drawing on research, we'll navigate common pitfalls and highlight pathways to mathematical fluency. Together, let's ensure every student feels empowered to excel as flexible additive thinkers!

Key takeaways:

1. Understanding of evidence-based approaches that explore the inverse relationship between addition and subtraction

2. Practical strategies and language tips to foster a deep, conceptual understanding of additive thinking

3. Various tools, representations, and activities designed to enhance student confidence and understanding of 'difference'

F07 A WHOLE SCHOOL FLUENCY PROGRAM - WHY, WHAT AND HOW

Subtheme: Pedagogy

Zahra Harvey and Adam Wight, Lysterfield Primary School
(F to Year 6)

Lysterfield Primary School (LPS) has implemented a whole-school number fluency program called LPS Maths Masters. Through this session, you will gain an understanding of what is meant by the term 'fluency' and why it is important to develop fluency to improve student outcomes. Additionally, you will learn about LPS Maths Masters - a developmental and sequenced set of skills learnt through a robust, structured and student-driven program. Finally, the session will cover the change management and professional learning involved

in launching a new whole school program with staff, students and the community, and the strategies employed to maintain and embed the program to continue its success.

Key takeaways:

1. Fluency reduces cognitive load allowing attention to more complex problems.

2. Fluency needs to be developed in a structured and sequential way, with a focus on mastery.

3. A well-crafted program can create engagement within a school community, lifting the profile of mathematics while improving student learning.

F08 COLLABORATE TO ELEVATE: ANTICIPATING STUDENT STRATEGIES

Subtheme: Pedagogy

Erin Whitbread, Gabby Vandekolk and Elise Wise, St Peter's Primary School
(F to Year 6)

The use of rich, challenging tasks encourages productive struggle and deep thinking, giving students opportunities to apply prior knowledge to unknown contexts and develop new learning. However, in reality, many teachers find the implementation of challenging tasks in the classroom to be overwhelming, struggling to support all students in their diverse needs and progressing all students towards the learning goal. In this session, we will share our experience in how we use effective collaborative planning structures to anticipate students' learning, strategies and misconceptions during a challenging task. This ensures teachers are equipped with the questions and prompts to assess students during the learning experience and enable all students to progress in their learning to experience success. Participants will have the opportunity to undertake the anticipate planning structure within the session to put into practice newly learnt skills.

Key takeaways:

1. The value of collaborative planning.

2. A structure for anticipating students strategies.

3. The use of questioning and prompts to support student learning.

F09 WHAT DOES IT MEAN TO 'BELONG' IN THE MATHEMATICS CLASSROOM?

Subtheme: Wellbeing

Kerryn Sandford, Heathmont College
(F to Year 12)

Sense of connectedness or belonging is a construct that is measured across the system as it is known to correlate strongly with academic achievement outcomes as well as with wellbeing and social outcomes. Emerging research is digging into the importance of a 'sense of belonging' or 'sense of connectedness' in classrooms and today's session will explore the importance of this construct for learning in mathematics as well as for emerging issues in mathematics education including the growing prevalence of maths anxiety and the attrition of certain cohorts (girls, Aboriginal and Torres Strait Islander people, people with disabilities) from the discipline.

The session will explore what is known in the literature and data sets (PISA, AToSS, etc) and identify strategies that teachers and leaders can use to improve belonging for staff and students.

Key takeaways:

1. Activities that can be used to explore levels of belonging of staff and students in the mathematics classroom.

2. Activities to build student (and staff) connectedness and belonging.

3. Where to go to find out more.

Remember: Phone to able access the QR code for the slides.

FULL F10 SUPPORT STUDENTS WITH MATHEMATICS LEARNING DIFFICULTIES (MLD)

Subtheme: Pedagogy

Jennifer Sze, The University of Melbourne
(Year 3 to Year 8)

In this presentation, I will discuss strategies to support students with maths learning difficulties (MLD), focusing on dyscalculia as the main learning difficulty. I will outline three key factors that may influence dyscalculic students' acquisition of numeracy and later mathematics: these are cognitive skills, mathematical language skills, and the affective domain, maths anxiety (Hornigold, 2024; Chinn, 2020).

SESSION F: Friday, 12.10pm-1.10pm (cont.)

Teachers will learn about different maths learning difficulties and their impact on their students' maths learning. They will also gain insights into strategies to support their students, such as the Concrete, Pictorial, Abstract (CPA) approach. In addition to Singapore Maths pedagogy of using word problems to teach their students point of needs.

Key takeaways:

1. Teachers will learn the overlapping nature of learning difficulties. These include dyslexia, dyscalculia, dysgraphia, dyspraxia and ADHD.

2. Teachers will learn the Concrete, Pictorial and Abstract pedagogy to teach students with mathematics learning difficulties.

3. Teachers will learn how to use the Bar Model to teach their students to solve word problems.

F11 TWEAKING TASKS TO IMPACT ENGAGEMENT AND LEARNING.

Subtheme: Curriculum

Yvonne Reilly, Sunshine College
(Year 5 to Year 10)

This session will describe how tasks have been shown to effect student engagement and may help teachers better understand how students respond to tasks. It will also give teachers ideas on how to make small changes to secondary textbook questions or worded problems, to maximise their impact on student learning. This session will demonstrate the importance of modelling, discourse and collaboration to mathematics learning.

Key takeaways:

1. Small changes to tasks for better impact.

2. Understanding task effect on engagement.

3. Leveraging modelling and discourse.

F12 SHIFTING STUDENT MINDSET TOWARD CELEBRATING THE PROCESS, NOT THE ANSWER.

Subtheme: Pedagogy

Mark Gleeson, Strathmore Secondary College
(Year 5 to Year 10)

Students anxious about mathematics, believe that maths is inherently difficult, and that finding a perfect answer quickly is the only measurement of success; they develop a negative mindset. Too many students feel like 'they will never be good at mathematics' or 'can't do maths.' Workshop participants will be given an overview of the development, application and implementation of a framework used at VSSEC that challenges students' perceptions around mathematics. The framework allows groups of students to collaboratively define a given problem, translate into an algebraic expression, compute using code, and reason and interpret their potential solution. As students applied this framework, their mindset started to shift toward 'I'm not good at maths, but I know what I can try next.' Students supported each other to solve applied problems. This framework and supporting resources will be given to participating teachers to use in their own classrooms.

Key takeaways:

1. Empower students to shift toward a positive mindset in mathematics.

2. Applied uses of Computational Thinking and Python in applied problem solving.

3. Strategies to improve literacy in mathematics.

Remember: Please bring a laptop, examples of your own applied problem solving questions, and a pen.

F13 NEW CURRICULUM, NEW OPPORTUNITIES

Subtheme: Curriculum

Michael Minas, Love Maths
(F to Year 8)

One of the most talked about issues in maths education at the moment is the new version of the curriculum. What has changed? How are different schools implementing the new curriculum? What impact will this have on current practices and documentation at your school? This session will highlight the important opportunities that have been provided by the

new curriculum to transform the way mathematics is taught. You will leave this session armed with practical ideas drawn from real classrooms of how to bring the new curriculum to life at your school.

Key takeaways:

1. How you can use the new version of the maths curriculum as an opportunity to improve the way that maths is being taught at your school.

FULL F14 THE PROBLEM WITH WORDED PROBLEMS IS THE WORDS!

Subtheme: Pedagogy

Antje Leigh-Lancaster, Leigh-Lancaster Consulting, Kris Westcott, Sackville Street Public School (F to Year 8)

This session will explore how 2-step worded problems can be tackled using a 'numberless' approach, where the numbers are removed, and the text adapted to help students focus on the 'essence' of the problem. We will show how teachers can use Newman's interviews to triage breakdowns and then implement Number less word problems to decompose a worded problem into a series of simpler statements designed to progressively reveal the mathematical relationships within the problem. Removing the numbers enables teachers to draw students into a conversation by asking questions such as:

- What is going on in the problem?
- What do we know about the quantities and relationships in the problem even though there are no numbers?
- What is the question asking us to find out?

This will be a practical, hands-on workshop, where you'll have the opportunity to learn and apply the approach to several 2-step worded problems.

Key takeaways:

1. An understanding of the practical application of error analysis interviews.

2. An understanding of the numberless word problem solving approach.

3. Practical experience with applying the approach.

F15 EMPOWERING EDUCATORS WITH GENAI: FUTURE PROOFING STUDENT LEARNING

Subtheme: Technology

Luke Clift, Kardinia International College (Year 5 to Year 12)

How can Generative Artificial Intelligence (GenAI) help educators future-proof their classrooms? This presentation will explore how this transformational technology can empower mathematics educators to improve student learning outcomes. Attendees will gain insights into practical strategies for integrating GenAI into mathematics planning, classroom activities, and post-lesson reinforcement. The session will cover how to use GenAI to create dynamic mathematics lesson plans, facilitate engaging and interactive classroom experiences, and provide personalised support to solidify students' mathematical knowledge and understanding. This will be an interactive and collegial session, fostering collaboration and shared learning. By focusing on the before, during and after phases of classroom instruction, this presentation aims to equip mathematics educators with the tools to effectively harness GenAI, ensuring that all students, including those from diverse backgrounds, can excel in a future-focused educational environment. Join me to discover how GenAI can be a catalyst for improved teaching practices and enhanced student learning.

Key takeaways:

1. Practical strategies: learn to meaningfully integrate GenAIinto mathematics lesson planning, classroom activities, and post-lesson reinforcement.

2. Interactive Learning: engage in rich collegial discussions and collaborative learning regarding best practices with GenAI.

3. Personalised support: discover how to use GenAIto provide tailored support for diverse student needs.

Remember: Laptop.

SESSION F: Friday, 12.10pm-1.10pm (cont.)

CANCELLED F16 EXPLORING CREATIVE GEOMETRY THROUGH DRAWING WITH MATHOMAT

(COMMERCIAL PRESENTATION)

Subtheme: Pedagogy

John Lawton, Objective Learning Materials, Michelle Du Toit, Atalia Academy, Christopher Tisdell, University of NSW
(Year 5 to Year 8)

Mathomat is a creative drawing tool which encourages the construction of mathematical knowledge through design. John Lawton will give an overview of the Mathomat template designs, including the new whiteboard and Mathomat Senior templates. Online learning developments in the Mathomat Activity Centre (MAC), as well as the new printed MAC guides for students will be discussed. Professor Chris Tisdell is academic advisor to Mathomat. Chris is exploring Mathomat drawing ideas with an intern, Fabian Dat Tranh. Chris reports (virtually) on their findings, including on their focus on thinking mathematically through the concept of geometrography (Lemoine, 1893). Michelle Du Toit uses Mathomat extensively in her teaching and professional development work. Michelle will present (virtually) her recently published MAC guide. Participants may retain the Mathomat templates and MAC guides used in the session, for subsequent evaluation.

Key takeaways:

1. Evaluation of the classroom potential of the Mathomat templates, student materials and MAC guide from John Lawton.

2. Understanding of the use of Mathomat with the concept of geometrography to encourage mathematical thinking from Chris Tisdell.

3. Understanding of how to use the different design features of Mathomat, by Michell Du Toit.

F17 PLANNING FOR SEQUENCES OF CHALLENGING TASKS USING THE HITS

Subtheme: Curriculum

Scott Hamilton and Kristyn Cram, Portland Primary School
(F to Year 8)

Too many teachers suffer from having access to too many resources. It gets tempting to use one rich task after another where despite our efforts, the content in the tasks don't flow and connect naturally. Scott and Kristyn will introduce you to their process for developing sequences of challenging tasks that fit with the High Impact Teaching Strategies and maximise their potential for student learning growth. They unpack an initial rich task to:

- List potential foci for explicit teaching.
- Anticipate student misconceptions and strategies for teacher responses.
- Plan differentiation using enabling and extending prompts.

They then use this information to choose suitable challenging tasks to develop sequences of learning that build from the initial task and flow through one another to allow students multiple exposures to essential content. Participants will see how a sequence is put together by experiencing the tasks in a successful sequence of learning.

Key takeaways:

1. What a high-quality sequence of challenging tasks looks like.

2. How we plan sequences of challenging tasks from an initial rich task that cater to the High Impact Teaching Strategies.

3. The importance of sequencing challenging tasks for students to connect learning and strategies in different contexts.

F18 A DEEPER LOOK AT TEACHER QUESTIONING

Subtheme: Pedagogy

Ellen Corovic, Monash University
(F to Year 8)

What questions do teachers answer? When should they be answered? What questions do teachers ask? When should they be asked? If you have wonderings about how to improve your teacher questioning techniques with an aim to enhancing student thinking, come to this hands-on session. In this session, participants will explore the art of teacher questioning. Starting from the questions teachers answers and finishing with the questions teachers pose. Teachers will reflect on their own practice and develop insights into how dialogue in their classrooms is developed and how to maintain student agency and thinking. Practical strategies drawn from research evidence will be explored, ready for teachers to trial in their classrooms.

Key takeaways:

1. Types of questions used in the classroom to maintain thinking.

2. Teacher practical reflection of practice.

3. Questioning strategies to trial.

CANCELLED F19 THE VICTORIAN CODING CHALLENGE - WHERE MATHS AND CODING SHINE.

Subtheme: Curriculum

Danijela Draskovic, The Mathematical Association of Victoria, Max Stephens, The University of Melbourne
(Year 5 to Year 10)

The Victorian Coding Challenge (VCC) is a MAV activity designed for students Years 5-10 interested in coding, problem-solving, and mathematics. It engages students with tasks integrating algorithms, computational thinking, and mathematics, aligning with Victorian Curriculum 2.0 requirements. Students will be so engaged in the tasks, they will hardly realise how much they are learning. Teachers will be provided all the resources to run the program seamlessly. In 2023, over 3000 students from government primary and secondary schools participated. This year, we expect even greater participation, including non-government schools. This MAV-coordinated session will explain the VCC and how to integrate it into your school's STEM or mathematics programs.

Delegates will experience tasks from our virtual kit and receive practical advice from experienced teachers on getting involved and implementing the VCC. They will also discuss the benefits for students, teachers, and the school community.

Key takeaways:

1. The Victorian Coding Challenge (VCC) engages students in coding, problem-solving, and mathematics.

2. MAV provides guidance and practical advice for integrating the VCC into school maths or STEM programs.

F20 ENGAGING, HANDS-ON CARD ACTIVITY OR ONLINE APP – NUMERO!

(COMMERCIAL PRESENTATION)

Subthemes: Curriculum, Pedagogy and Technology

Julie Richards, NUMERO/Independent Education and Training (IET)
(F to Year 10)

Numero, a card activity with online app option, is suitable for all years of education. It can significantly aid development of fluency, problem solving and reasoning. Numero is ideal for introducing and reinforcing both simple and complex maths concepts and providing a practical application of abstract notions of mixed numerals and indices, making lessons more relevant. The differentiation offered by Numero is second-to-none. Numero, created in 1993, then trialled by Dr Paul Swan while lecturing at Edith Cowan University in Bunbury, is played by thousands of students in hundreds of classes from Kindy to Year 10. In this session, participants will be shown how to develop students' understanding and fluency of number using Numero. They will also be shown how Numero can be implemented with cards and/or with the digital app, using the tool of their choice for the desired outcome. The workshop is fun, interactive and very hands-on, so come prepared to get involved and find out how engaging and productive maths can be while playing and teaching Numero.

Key takeaways:

1. A practical way to engage students in their mathematical learning.

2. Support teachers with a mental maths program that will grow with their students.

3. Differentiation for all age, year level and mathematical ability, both hands-on and digital.

SESSION F: Friday, 12.10pm-1.10pm (cont.)

FULL F21 TOOLKIT FOR TEACHERS NEW TO MATHEMATICAL METHODS UNITS 1-4

Subtheme: Pedagogy

Vincent Lam, Loyola College
(Year 11 to Year 12)

I will share many tricks and strategies to maximise the efficiency of teaching Mathematical Methods. These include different ways of explaining difficult concepts and ideas on how to help student better visualise, understand, and remember concepts from Mathematical Methods, namely from the areas of functions, relations and graphs, algebra, number and structure, calculus, data analysis, probability, and statistics. For example, I will share how I explain to students the idea of limits, using analogies that students already understand. You are invited to take my ideas and adapt them to what works for you!

Key takeaways:

1. Effective strategies for teaching Maths Methods concepts.

2. Tricks that can be used to explain concepts and motivate students.

Remember: Bring an open mind. You may not like the ideas I present - you may have a better strategy. That's a good thing. This presentation is designed to provoke your own thinking.

FULL F22 TI-NSPIRE HINTS, SHORTCUTS AND ENHANCEMENTS TI-NSPIRE HINTS, SHORTCUTS AND ENHANCEMENTS

Subtheme: Technology

Neale Woods, Retired
(Year 9 to Year 12)

In this session, participants will have the opportunity to learn a series of hints and shortcuts using TI-Nspire technology. The material covered can enhance student learning and engagement, and help students maximise the time available in technology permitted examinations. The main focus of the workshop will be on using TI-Nspire CAS but much of the content will also be suitable for the non-CAS technology. Participants will have the opportunity to share their own hints and shortcuts.

Key takeaways:

1. Technology

2. Efficiency

3. Engagement

Remember: Bring a TI-Nspire handheld and/or a laptop with TI-Nspire software installed (CAS or non-CAS).

FULL F23 EFFECTIVE CLASSROOM TEACHING OF SECONDARY SCHOOL MATHEMATICS

Subtheme: Pedagogy

Peter Collins, Parkdale Secondary College
(Year 7 to Year 12)

You have just got a job teaching maths - what do you do now? Things I know and use, that I wish I knew 34.75 years ago. In this session, the presenter will outline a number of strategies and philosophies, that he has found since finishing university, that he uses while planning and teaching class. He uses them because they work. They are from a wide variety of sources and have all been effectively trialled. They are not just about avoiding pitfalls, they are based on maximising learning success and creating the environment in which this can happen. The format will be a lecture, but with an emphasis on being interactive with a lot of attendee input. This session is aimed at beginning maths teachers - both inexperienced teachers and teachers who are teaching outside their area of training. It is delivered by a very experienced teacher and presenter.

Key takeaways:

1. Feel better prepared and confident in terms of how to plan a maths lesson or series of lessons.

2. Feel better prepared and confident to teach a maths lesson or series of lessons.

Remember: Before attending, honestly reflect on what you would like to know and have confidence in, in terms of maths teaching in particular. Bring a notebook.

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SESSION F: Friday, 12.10pm-1.10pm (cont.)

F24 LESSON ACTIVITIES FOR 9-10 ALGORITHMIC THINKING REFERENCING MATHEMATICS 2.0

Subtheme: Curriculum

Georgia Gouros, The Centre for Higher Education Studies (CHES)
(Year 9 to 10)

This session will explore several lesson activities ideas for the 9-10 mathematics classroom with the goal of developing students' algorithmic thinking referencing the new Victorian Curriculum Mathematics 2.0. The sample lesson activities presented will have a focus on using engaging games and logic puzzles to develop student understanding of matrices and networks. The goals of the sample lessons presented are to facilitate the requirements of the new Victorian Curriculum in developing students' learning to implement algorithms that use data structures using pseudocode or a general-purpose coding language.

Key takeaways:

1. Suggested sample lessons and activities for developing algorithmic thinking in the 9-10 maths classroom will be provided to teachers.

2. Teachers will explore and discuss the new changes around developing algorithmic thinking in students in the Victorian Maths Curriculum for 9-10.

Remember: Text based coding using Python3/Trinket in browser online www.trinket.io/python3 - block based coding using Snap! from online at https://snap.berkeley.edu.

F25 GETTING INTO THE SWING OF THINGS WITH TRIGONOMETRY

Subtheme: Technology

Shelley Pendlebury, John Paul College, Peter Fox, Texas Instruments
(Year 9 to Year 12)

A dynamic unit circle, modelling motion and a pig stampede, in this session we're covering all things Trigonometry and Pigonometry. A sprinkle of General, a large dose of Methods and a touch of Specialist, we're tackling trigonometry from every angle. You will need a TI-Nspire calculator, a pen and a sense of humour. Come along and engage in a range of activities, collect some ready-made resources and loads of inspiration, including extracts from 'The Love Triangle'.

Key takeaways:

1. Triangles are everywhere.

2. Novelty helps make things memorable.

3. Story telling helps make things meaningful.

F26 NAÏVE BAYES – FROM SPAM DETECTION TO SORTING HAT

Subtheme: Pedagogy

Echo Gu, Lauriston Girls' School
(Year 9 to Year 12)

Naïve Bayes classifier is a simple and efficient machine learning algorithm that builds on the knowledge of conditional probability. A teaching sequence is designed to facilitate the transition from probability theories in Mathematics to classification tasks in data science. It was implemented and refined in a classroom setting. Students' insights and responses are discussed to illustrate that the content is accessible for secondary mathematics students as a stepping stone into the world of data science. When new information is used to update prior beliefs, students can gain experience in this discipline, transferring data into knowledge.

Key takeaways:

1. A teaching sequence that introduces a classification algorithm to senior secondary students in an engaging way.

2. A knowledge and technology themed TOK activity for IB DP schools.

Remember: Prior knowledge: conditional probability and a basic familiarity with the Harry Potter series. There is no coding in this session.

F27 HOW TO HELP STUDENTS VISUALISE TRANSFORMATIONS USING TECHNOLOGY

Subtheme: Technology

Narcisa Corcaci and Tran Trinh, Suzanne Cory High School
(Year 9 to Year 12)

This workshop presents pedagogical approaches that will support teachers effectively unpack the concept of transformations and prepare meaningful activities. Through interactive demonstrations, using visual aids

such as DESMOS, GeoGebra and technology CAS, we will explore transformations and the relationship between function notation and mapping equations. By navigating from concrete examples to general cases, and by using animations, the workshop showcases approaches to promote deep learning. This workshop is suitable for those teachers who would like to add new strategies into their repertoire and covers aspects related to level 10A of the Victorian Curriculum as well as Maths Methods Units 1-4 content. These activities will give students techniques they can rely on to successfully solve problems related to transformations in various contexts.

Key takeaways:

1. How to use technology to enhance student learning of transformations.

2. How to make the link between function notation and mapping equations.

3. How to use animation to understand general cases.

Remember: Laptop.

FULL F28 ENGAGING STUDENTS THROUGH MATH'S GAMES: BUILDING TEAMWORK AND COMMUNICATION SKILLS

Subtheme: Technology

Vito Boglietti, Parkdale Secondary College
(Year 7 to Year 10)

Through engagement, low cognitive entries and rapid paced lessons we can teach for the new generation of phone dependent students. Games are a well-known skill students have mastered. In this session we will be looking at maths games as part of an engaging learning setting.

Key takeaways:

1. Building learning outcome for maths games in your class.

2. Measuring the hard maths skills and soft social skills using games.

3. Firing up your imagination to come up with new games and forms of learning that match the needs of your unique maths classes.

Remember: An open mind.

SESSION G: Friday, 2pm-3pm

G01 DIFFERENTIATION THROUGH A FOCUS ON KNOWLEDGE AND SKILLS

Subthemes: Pedagogy, Curriculum

Zahra Harvey, Lysterfield Primary School
(F to Year 6)

I have 28 students in my class. How can any whole class teaching be targeting all of their learning needs? Teachers regularly grapple with the concept of differentiating teaching to a wide range of learners. Homogeneous grouping (streaming) is proven to cause more harm than good for some learners. So how does one keep the class heterogenous, whilst also ensuring all students are learning? This session will focus on how a two-pronged approach can address this common problem of practice:

- Whole class instruction that focusses on the knowledge of mathematics developed through conceptual frameworks or big ideas.
- Individual and small group instruction that focusses on explicitly teaching the skills to do mathematics through individual learning goals.

Key takeaways:

1. An understanding of how concepts or big ideas can be differentiated for a range of students.

2. An example of how individual learning goals can develop skills for every student.

3. A framework for implementing the curriculum focussed on knowledge and skills.

FULL G02 EXPLICIT TEACHING & RICH PROBLEMS: HOW TO MARRY THE TWO!

Subtheme: Pedagogy

Catherine Epstein-Rodgers, St Peter's East Bentleigh, Antje Leigh-Lancaster, Leigh Lancaster Consulting

(Year 3 to Year 6)

Explicit teaching is one of 4 elements in the updated Victorian Teaching and Learning Model 2.0 released this year. In this session we will discuss some approaches that 'marry' explicit teaching and rich problems. This marriage provides students with the tools and strategies to engage with challenging problems, and the opportunity to explore, reason, justify, connect ideas and deepen understanding. Engagement is a key element to success in mathematics and central to fostering a positive disposition, which is often regarded as the 5th proficiency in mathematical education. In this interactive session you will engage with a challenging problem and use this to consider and discuss the aspects and approaches outlined above.

Key takeaways:

1. Strategies to help students engage in problem solving.

2. The benefits of explicitly considering what's required for students to lead into successful problem solving.

3. The importance of fostering a positive disposition towards mathematics learning.

G03 IDENTIFYING QUALITY ONLINE RESOURCES

Subthemes: Curriculum, Pedagogy

Cassandra Lowry, University of Newcastle
(F to Year 6)

There's been an explosion of education resources found online, often located on education marketplace sites, but how do you identify the quality of these resources? This hands-on workshop will explore the use of the Task Analysis Guide, developed by Stein et al (1996), to evaluate the quality of resources. Participants will have the opportunity to collaboratively use the guide to identify the strengths and weaknesses of a range of sample tasks. Finally, participants will be shown examples of high-quality online resources, games and manipulatives that they can use in their classrooms to support and engage their students in quality instruction.

Key takeaways:

1. Identify quality mathematics resources.

2. Use the task analysis guide to evaluate the strengths and weaknesses of online resources.

3. Explore examples of quality resources.

G04 MINDSET MATTERS: CREATING PRODUCTIVE DISPOSITIONS FOR NUMERACY SUCCESS.

Subtheme: Wellbeing

Monica Waterworth, Derinya Primary School, Elise Copsey
(F to Year 6)

Join us as we explore the impact that students' mindsets have on their progress in mathematics and the role that teachers can play in enhancing student attitudes and dispositions towards learning.

This workshop will be a professional exploration of the four essential steps to foster a maths mindset culture in your school:

- Reflect with stakeholders.
- Collaboratively construct consistent messaging.
- Develop maths mindsets in the classroom.
- Embed maths mindsets across the school community.

Participants in this workshop will be given the opportunity to reflect on their own teaching practice and discover practical ways to build positive attitudes and maths wellbeing. Informed by the most current research on maths anxiety and mathematical mindsets from key researchers including Dr Jo Boaler and Dr Sarah Buckley, this workshop aims to equip teachers with the knowledge needed to boost student engagement and achievement and promote an appreciation for mathematics.

Key takeaways:

1. As educators, our personal maths journeys influence our teaching.

2. Mindset messaging that is evidence-based, consistently reinforced and embedded across the school community has the power to positively impact maths wellbeing.

3. Participants will take away a strategic and practical plan, incorporating lesson structures and shared language, to promote productive dispositions and a positive maths mindset culture in their own classrooms and communities.

G05 LEADING CHANGE IN MATHEMATICS

Subtheme: Leadership

Jayde Williams, Milgate Primary School
(F to Year 6)

With the significant increase in expectations on teachers and changing priorities in schools, leading change in a school can be daunting for everyone involved. This session will take you through one school's journey of transforming their mathematics teaching and learning approach through an exploration of values, coaching and mentoring, professional learning and personal inquiries. Learn how we evolved our teaching and learning program to include the Launch, Explore, Summarise lesson structure, built teacher content and pedagogical knowledge, and ensured that students were at the forefront of our planning.

Key takeaways:

1. Values and vision: emphasising values guides educational change amid evolving expectations.

2. Coaching and mentoring: support teachers with coaching and mentoring to enhance content and pedagogical skills.

3. Student-centred Learning: focus on students with structured lessons like Launch, Explore, Summarise for meaningful educational transformation.

G06 REINVIGORATING BEST PRACTICE MATHEMATICS TEACHING

Subtheme: Pedagogy

Adele Gregson, Beth Dean, Melinda Ruscitti and Kate Buzaglo, Bimbadeen Heights Primary School
(F to Year 6)

In 2023 Bimbadeen Heights Primary school embarked on a professional learning journey focussed on transformation in the teaching and learning of mathematics through participation in the Primary Mathematics and Science Specialists (PMSS) program. In this session, we will share how school leadership and the school's PMSS teachers have worked towards implementing whole school change. We will explore how collaboration and relational trust between Principals and middle leaders can embed best practice in the teaching and learning of mathematics at a primary school level.

SESSION G: Friday, 2pm-3pm (cont.)

Key takeaways:

1. The importance of specialised professional development in fostering educational leadership.

2. Strategies for effective collaboration between specialists and school leadership.

3. Practical examples of implementing whole school curriculum changes.

Remember: Paper/pen and devices for note taking.

G07 UNLOCKING STUDENT POTENTIAL: INFORMAL ASSESSMENT IN THE PRIMARY MATHEMATICS CLASSROOM

Subtheme: Pedagogy

Anita Green, Monash University
(F to Year 6)

This session will focus on the use of informal assessment in the primary mathematics classroom. We will explore a range of effective strategies for informally assessing students during lessons, allowing teachers to gain valuable insights into students' understanding and proficiencies in mathematics. We will discuss the kinds of rich information that can be gathered in real-time, which is often not captured by formal assessments. We will then examine how this information can be utilised to provide immediate feedback and make adjustments to the teaching and learning in the moment.

Key takeaways:

1. Strategies for informally assessing students during lessons.

2. Information that can be gained through this form of assessment (particularly related to the mathematics proficiencies) .

3. How this information can be used to enhance learning.

CANCELLED G08 I DO, WE DO, YOU DO, THEN FORGET.

Subtheme: Pedagogy

Heather Ernst, Federation University Australia
(Year 3 to Year 6)

The Gradual Release of Responsibility, often referred to as 'I do, we do, you do,' is a popular method for explicitly teaching rules and procedures. Can it also be used to teach true understanding, problem-solving, and reasoning, as required by the mathematics curriculum proficiencies? This session will explore the positives and negatives of this approach, with examples from various mathematical strands and levels. Participants will have the opportunity to share their examples and adapt current tasks.

Key takeaways:

1. You will know when to use the gradual release of responsibility, and when not to.

2. You will come away with sample tasks to support students in developing understanding, problem-solving and reasoning.

3. You will take away strategies to convert routine tasks to rich learning tasks.

G09 MATHEMATICAL WELLBEING THROUGH INTENTIONAL FUN

Subtheme: Wellbeing

Andrew Lorimer-Derham, Think Square
(Year 3 to Year 10)

This playful session will explore a range of creative activities designed to engage any learner, build skills and confidence, and promote rich mathematical discussion. Come prepared to participate! This hands-on session is designed to give teachers a joyful, communal experience of maths that can completely transform student dispositions and develop positive relationships within the classroom. Teachers will leave with a range of engaging tools and games they can immediately try in their own classrooms.

Key takeaways:

1. Maths can be both playful and purposeful at the same time.

2. Changing negative student disposition about maths is vital to academic success.

3. You can design joyful mathematical experiences that cover content more deeply and efficiently than a traditional worksheet.

G10 A CULTURAL SHIFT FOR SUPPORTING ABORIGINAL AND TORRES STRAIT ISLANDER MATHEMATICS LEARNERS

Subtheme: Leadership

Jennifer Bowden, The Mathematical Association of Victoria, Kerryn Sandford, Heathmont College
(F to Year 12)

In April 2024, Jen and Kerryn represented MAV at the inaugural National Indigenous Mathematics Summit, attended by mathematics associations from each state, and led by the Australian Association of Mathematics Teachers (AAMT) and the Aboriginal and Torres Strait Islander Mathematics Alliance (ATSIMA). This workshop will share our learnings from two days of truth-telling, sharing, and collaborating to create a National Commitment Statement aimed at driving a cultural shift and making a systematic difference in mathematics education for Aboriginal and Torres Strait Islander learners. We look forward to hearing your stories, build relationships, and sharing our aspirations, including MAV's Action Plan and the steps we are taking to lead and support culturally responsive practices. Join us to contribute to this important dialogue and collective effort.

Key takeaways:

1. Sharing and relationship building: participants will engage in sharing stories and emphasising the importance of community and collaboration.

2. Action plans and culturally responsive practices: highlight MAV's Action Plan and actions in culturally responsive practices in mathematics education, demonstrating practical approaches and supporting delegates to create their own plans.

G11 APPROACHES TO PLANNING, TEACHING AND ASSESSING MATHEMATICS V2.0: STORIES FROM FOUNDATION TO YEAR 7

Subtheme: Curriculum

Sharyn Livy, Monash University
(F to Year 8)

Throughout this year, Sharyn has been visiting schools and engaging with teachers from Foundation to Year 7, gathering insightful stories that reveal their understanding and application of the Victorian Curriculum F-10 Version 2.0 in Mathematics.

This presentation will delve into the experiences and narratives of Victorian teachers who shared their approaches to using the curriculum for planning, teaching, and assessing. It will focus on three key areas: planning, assessing, and understanding of the unique features of mathematics V2.0. The stories and experiences shared in this presentation aim to inspire and inform participants about the effective practices being implemented across Victoria.

Key takeaways:

1. Participants will extend their understanding of approaches to planning, assessment and some of the unique features of Mathematics V2.0.

FULL G12 HAVING SOME FUN WITH NUMERACY AND MATHS

Subtheme: Pedagogy

Dave Tout, ACER and University of Melbourne
(Year 3 to Year 12)

This practical, hands-on workshop will enable participants to experience different games and activities suitable for classroom use with a range of numeracy and maths students. The activities focus on the development of core maths skills through the use of games, real-life and hands-on materials, as well as on enjoyment and having fun with maths. Some are whole group activities; others are small group work and others take an individual focus. The activities will illustrate alternative approaches to the traditional worksheet or textbook approach for teaching numeracy and maths. The activities have mainly been developed for youth and adult numeracy students but are suitable for all students, especially middle years and VM/VCE VM students.

Key takeaways:

1. Games and activities to use in your classrooms that are suitable for use by a range of students.

2. How games and activities can support a range of different positive outcomes for both the learner and the teacher.

SESSION G: Friday, 2pm-3pm (cont.)

G13 TEACHING GRAPHS AND NETWORKS AT JUNIOR SECONDARY LEVEL

Subtheme: Curriculum

Robert Money
(Year 7 to Year 10)

Teachers need not wait until Year 10 to introduce students to this topic. The resources provided in this session should be engaging for students of different ages and interests. These resources should be suitable for the study of simple graphs at Level 7, polar graphs and Euler's Rule at Level 8, 'path' and 'trail' problems at Level 9 and weighted directed graphs at Level 10. To allow for this inclusion suggestions are made for less emphasis on some topics from the Level 7/8 ' Space' curriculum.

Key takeaways:

1. Suggestions for school level curriculum development.

2. Quality resources at appropriate year levels.

3. Innovative practices for engaging students and improving learning.

Remember: Your phone.

G14 THE ROLE OF AUTHENTIC DATA IN MATHS EDUCATION

Sub-theme: Curriculum, Pedagogy, Technology

Allan Dougan, AAMT
(Year 3 to Year 10)

In this session we will explore how real, available, and sometimes 'hard' data provides for authentic learning opportunities in mathematics in a way that sparks curiosity in students. By working with authentic data, students develop critical thinking skills. They learn to ask the right questions, analyse information, and draw meaningful conclusions. This not only strengthens their mathematical abilities but also prepares them for a data-driven world.

Key takeaways:

1. Using real and sometimes challenging data in mathematics fosters authentic learning experiences that engage students and spark their curiosity.

2. Engaging with authentic data helps students develop critical thinking skills, enabling them to ask the right questions, analyse information, and draw meaningful conclusions.

3. This approach strengthens mathematical abilities while preparing students for a data-driven world.

G15 ALGEBRA THROUGH GEOMETRY

Subtheme: Pedagogy

Doug Williams, Mathematics Centre
(Year 5 to Year 8)

Recently a teacher who was finding this session challenging suddenly asked: 'Are you trying to get us to think differently?'. Well, yes, but not me, Scottish educator Geoff Giles, the creator of the concept. A square is X. A quadrant with a radius the same length as a side of the square is Y. Using materials, you will dig into spatial challenges and connect with algebra such as the concept of a pronumeral, combining like terms, the distributive law and linear factorisation, mostly by asking: 'Can I check this another way?'. A master for the materials and links to investigation guides will be supplied.

G16 HOW TO USE QUESTIONS TO UNLOCK CREATIVITY

Subtheme: Pedagogy

Michaela Epstein, Maths Teacher Circles
(F to Year 12)

Maths is built on logic. Yet, that logic isn't always obvious to students. Instead, many find maths confusing and full of meaningless rules that are quickly forgotten. So, how might we help students to make sense of the maths that they learn? In this session, you'll look at what happens when students play with, pull apart and form connections between mathematical ideas. You'll examine how risk-taking, and creativity go hand-in-hand and are essential for building deep conceptual understanding, for students of all ages. Michaela will share 5 practical strategies that are designed for you to implement easily. These are classroom strategies you can use with existing resources, and to help your students go from passive rule following to creative and independent thinking in maths.

Key takeaways:

1. Know why creative thinking is important for all students in maths.

2. Know how to frame questions, prompts and tasks to encourage creativity.

3. Get 5 practical strategies you can use to help your students go from passive rule following to deep & creative thinking in maths.

G17 EMPOWERING TEACHERS IN THE IMPLEMENTATION OF VICTORIAN CURRICULUM 2.0

Subtheme: Curriculum

James Dixon and Ramya Deepak Kumar,
Mount Waverley Primary School

(F to Year 8)

With the revised Victorian Curriculum 2.0 being implemented across our state, it is important that teachers are part of all key curriculum documentation in school, and this process is aligned to their daily teaching. The approach shared here showcases how we built our teachers' knowledge and ownership of mathematics VC 2.0 whilst enriching their understanding of implementing this in their day-to-day lessons. We explore our work on focusing on the verbs identifying each descriptor and how that aligns with our practice of co-constructing success criteria with our students that in turn activates deep learning.

Key takeaways:

1. V2.0 structured and streamlined process for staff agency and uptake.

2. Use of verbs as the core unit in scaffolding learning and building a learning continuum.

3. Success criteria and its co creation as an important tool for differentiation.

G18 ALIGNING SUCCESS CRITERIA FOR MATHEMATICAL PROFICIENCY: QUESTIONS TO BE CONSIDERED

Subtheme: Pedagogy

Eamon Light,
(F to Year 10)

In this presentation, success criteria will be positioned as central to supporting student agency and success in mathematics classrooms. Participants of this workshop will be immersed in stories of practice from primary school settings. Teachers can reframe success criteria statements as questions that are both content and proficiency focused, to provide an effective feedback system for students and enable them to achieve the aligned and intended mathematical outcomes. Participants will be challenged to reposition success criteria as the centrepiece of planning and will explore the importance of developing their mathematical content knowledge in preparation for explicit teaching opportunities. Research about aligning and explicitly stating mathematical expectations with assessment will be used to support this presentation and also demonstrate how peer feedback and peer assessment systems can be enhanced.

Key takeaways:

1. Success criteria can be helpful in students assessing themselves against content and proficiency strands.

2. Alignment between expectations and assessment of mathematical understandings is needed for student success.

3. Success criteria statements are for teachers, questions are for students.

CANCELLED G19 CO-DEVELOPING THE UNDERSTANDING OF THE EQUAL SIGN AND FORMAL EQUATIONS.

Subtheme: Curriculum

Jiqing Sun, Deakin University
(Year 3 to Year 8)

Fostering students' relational conception of the equal sign (viewing the equal sign as indicating an equivalence of two sides rather than a 'show result' symbol) is challenging, and students' misconception of the equal sign is persistent. However, students in China commonly possess a robust understanding towards the equal sign by the end of primary school.

This presentation will introduce the pedagogy and lesson sequences on how the conception of the equal sign is reinforced in the context where the formal equation is introduced. With this pedagogy, Chinese students' understanding of the equal sign and the formal equation are enhanced simultaneously. The presenter considers the pedagogy and lesson sequences introduced to be adaptable to both Australian primary and junior secondary classrooms, whether fostering the conception of the equal sign or the understanding of formal equations.

Key takeaways:

1. The pedagogy support for primary teachers to develop students' conceptions of the equality and the equal sign (e.g. AC9M4A01)

2, The pedagogy support for secondary school to develop students' understanding of the formal equation. (e.g. AC9M7A02, AC9M7A03)

G20 BUILDING THINKING CLASSROOMS IN A SENIOR CLASS

Subtheme: Pedagogy

Lorna McClory, Bacchus Marsh College
(Year 9 to Year 12)

This session will cover hints and tips on implementing the practices described in the *Building Thinking Classroom* book by Peter Liljedahl in Years 10-12. It will focus on strategies for building collaboration and thinking within the VCE course. Participants will be provided sample tasks and thin sliced question sets. Discussions will include the effects on student engagement and achievement. Participants will also be provided opportunities to discuss student and teacher moves in a thinking classroom.

Key takeaways:

1. How to encourage more thinking in a VCE classroom.

2. How to utilise knowledge mobility to improve all results.

3. How to move students from mimickers to thinkers.

G21 TAYLOR SERIES FROM SYMMETRY OF QUADRATIC FUNCTION USING T-NSPIRE CAS

Subtheme: Pedagogy

Wenting Liu Yeungnam University, Republic of Korea

(Year 9 to Year 12)

The concept of symmetry, taught from the lower secondary school, is one of the most important properties of quadratic functions. However, in mathematics textbooks, this symmetry is only briefly mentioned, and there is no content utilising this symmetry. In this session, we aim to address the process of transforming quadratic functions into factored forms and completing square forms using the symmetry through experimenting graph activities on the TI-Nspire CAS. Furthermore, determining the signs of coefficients from the graph of a given quadratic function is challenging mathematical reasoning for middle school students. This session seeks to address the process of easily inferring the signs of coefficients of a quadratic function graph by utilising linearity and polynomial properties of quadratic functions. Lastly, we aim to understand the Taylor series expansion process of a given function using the symmetry and linearity of quadratic functions through the TI-Nspire CAS.

Key takeaways:

1. Deriving factorisation and complete square form from the symmetry of quadratic function graphs.

2. Easily deducing the signs of coefficients from the given quadratic function graphs.

3. Understanding Taylor series expansion through experimenting quadratic function graphs using the TI Nspire CAS.

G22 ADVANCEMENTS IN SCIENTIFIC CALCULATORS - 8200 + EMULATOR

(COMMERCIAL PRESENTATION)

Subtheme: Technology

Alastair Lupton, Adelaide Botanic High School
(Year 7 to Year 10)

Contemporary scientific calculator has come a long way – without the high profile (or price tag) of CAS technology. Accessible and widely used, newly released models like the Casio fx-8200AU feature exact arithmetic, new ways to move between multiple representations of number, high

quality statistical tools and the tabular representation of functions. As the ubiquitous technology in the middle school, these advances present significant pedagogical opportunities. Being web-based, the 8200 emulator broadens what is expected of such tools, connecting the calculative to the graphical with a click. Come to the workshop and see the 8200 and its emulator in action. Pop past the Casio stand beforehand and get the emulator on your web-enabled device.

Key takeaways:

1. Scientific calculators have changed - exact arithmetic, improved statistical tools, working with functions.

2. Web-based emulators can connect the calculative with the graphical in intuitive ways that support student learning.

Remember: Visit the Casio team at their booth prior to the workshop to set up your classpad.net login and get a free emulator licence.

G23 DEATHRAYS AND DEDUCTIONS: HOW THE ANCIENT GREEKS SHAPED MATHEMATICS

(COMMERCIAL PRESENTATION)

Subtheme: Pedagogy

Jo Clyne and Tom Harris, Hellenic Museum
(Year 7 to Year 10)

Did you know that Pythagoras was the leader of an ancient mystic movement who believed that numbers had personalities? Or that Archimedes designed a Death Ray to defeat the Roman navy? This session introduces teachers to a series of upcoming secondary maths workshops offered by the Hellenic Museum. Through these workshops, students and teachers will delve deeply into the ancient Greek origins of mathematical thought and learn about the ancient personalities featured in the Victorian Curriculum for mathematics. Workshop participants will enjoy a hands-on experience with ancient technologies and recreate ancient mathematical reasoning. This session is guaranteed to astonish and delight even the most experienced maths teachers.

Key takeaways:

1. Practical, hands-on interaction with ancient technologies, demonstrating the principles of the Victorian Curriculum for mathematics.

2. Increased contextual understanding of the origins of Western mathematics through the lives of its founders.

3. Enhanced critical thinking as participants explore why current mathematical principles work.

G24 EMPOWERING TEACHERS WITH INNOVATIVE PRACTICES FOR THE REVISED VICTORIAN CURRICULUM

(COMMERCIAL PRESENTATION)

Subtheme: Curriculum

Katharine Lin, Edrolo
(Year 7 to Year 10)

Curriculum alignment and integration: Present strategies for aligning teaching resources with the revised Victorian 2.0 curriculum, ensuring seamless integration across different educational stages and subject areas.

Evidence-based teaching strategies: Highlight effective teaching strategies grounded in current research that improve student engagement and learning outcomes in mathematics.

Innovative classroom practices: showcase innovative practices and technologies that enhance the learning experience, such as interactive digital tools, flipped classrooms, and project-based learning.

Key takeaways:

1. Attendees will leave the session with a better understanding of the main shifts in new curriculum and aligning lesson structure to the new outcomes e.g. integrating technology, modelling, simulations into larger investigation tasks. Attendees will leave with practical teaching strategies they can implement immediately into their daily practice.

G25 THE TI-NSPIRE GEOMETRY APPLICATION

Subtheme: Technology

Neale Woods, Retired
(Year 7 to Year 10)

In this session, participants will engage in a range of activities using the often-under-utilised TI-Nspire Geometry application. These activities include dynamic geometrical constructions, verifying static textbook examples and exercises.

SESSION G: Friday, 2pm-3pm (cont.)

Accessing geometry in this dynamic environment can assist students in their understanding of geometrical concepts. The main part of the session will involve activities using TI-Nspire technology (both CAS and non-CAS). The last part will show some of these activities using a variety of other technologies, such as Geogebra, Geometry Expressions, GX Web and Cabricloud.

Key takeaways:

1. Dynamic geometry.

2. Use of technology.

3. Skills enhancement.

Remember: Bring a TI-Nspire handheld and/or a laptop with TI-Nspire installed (CAS or non-CAS). A laptop is preferred as participants can use it to access a range of online geometry software.

G26 PEDAGOGY IN ACTION: COMPLEX NUMBERS WITH TI-NSPIRE AND VISIBLE LEARNING

Subtheme: Pedagogy

Greta Gomes, Stonehill International School,
James Mott, Southern Cross Grammar
(Year 11 to Year 12)

Prepare to embark on a journey where pedagogy transforms the teaching and learning of mathematics. In this session, discover how problem-solving, reasoning, communication, making connections, creating representations, and investigating come together to foster critical thinking. Drawing insights from *Concept-Based and Visible Learning for Mathematics*, we'll explore the power of clear learning intentions, actionable feedback, and metacognitive strategies. Through active participation and dynamic exploration, students will unravel the mysteries of complex numbers, a topic that students and teachers often find difficult in VCE Specialist Maths and IB Analysis and Approaches HL. Leveraging TI-Nspire technology, abstract concepts become tangible and manipulable. Witness how integrating these evidence-based strategies can create a classroom where students are not just learning but thriving. Join us to unlock the secrets of effective mathematical pedagogy, harnessing the full potential of surface, deep, and transfer learning. Are you ready to transform your teaching and captivate your students?

Key takeaways:

1. Understand how to develop and differentiate surface learning, deep learning and transferable learning.

2. Promoting 'big ideas' through inquiry and critical thinking.

3. Learning how to leverage TI-Nspire technology to facilitate investigation by searching for patterns, testing conjectures, justifying interpretations and generalising results.

Remember: Participants are encouraged to bring their own CAS device. Spare TI-Nspire CAS handheld calculators will be available to borrow during the workshop.

G27 A BLENDED MATHEMATICS & CODING CURRICULUM - A CASE STUDY

Subtheme: Technology

Toan Huynh, CS in Schools, Lindsay Hill, Camberwell Girls Grammar School
(Year 7 to Year 10)

Toan Huynh, the Director of Teaching and Learning at CS in Schools, and Lindsay Hill, a senior mathematics teacher at Camberwell Girls Grammar, presents a case study detailing how a digital technology coding course was customised and taught within a unit of mathematics to resounding success and high levels of student engagement. With growing focus on the teaching of algorithmic and computational thinking within the mathematics curriculum, this case study provides invaluable insight and tips for how content spanning both the mathematics and digital technologies learning areas can be successfully delivered in a blended and engaging manner.

Key takeaways:

1. How to successfully deliver a blended curriculum address both mathematics and digital technologies content.

2. Tips on how to engage classrooms of girls with maths and digital technology.

3. Links to classroom-ready resources.

Remember: Laptop with internet access.

G28 CALCULUS WITHOUT ALGEBRA USING PRIMARY SCHOOL ARITHMETIC AND EXCEL.

Subtheme: Pedagogy

Enzo Vozzo, Mentone Grammar
(Year 11 to Year 12)

The fundamental theorem of calculus that connects the two branches of differential and integral calculus is one of the greatest milestones and discoveries in the history of mathematics. Although algebra is used to prove this important theorem, students who struggle with algebra miss out on appreciating how derivatives and integrals are intimately related. However, without any algebra, we can show the fact of this theorem using only the four operations of arithmetic (primary school maths!) and Excel. We will analyse functions such as polynomials, trigonometric, exponential, logarithmic and others by dividing them into 100 (or more) rectangles. Then calculating dy/dx (using subtractions and divisions) and areas (using multiplications and additions), the original function can be reconstructed after differentiation and integration, hence showing the inverse nature of these two branches of calculus.

KEY TAKEAWAYS:

1. A non-algebraic demonstration of the fundamental theorem of calculus.

2. Use of primary school arithmetic (addition, subtraction, multiplication and division) to demonstrate the fundamental theorem of calculus.

3. Use of simple operations in Excel to demonstrate the fundamental theorem of calculus.

Remember: Delegates should be familiar with the fundamental theorem of calculus and have a basic working knowledge of Excel. You are invited to bring you laptop with Excel installed so you can implement the demonstration of this theorem.

SESSION H: Friday, 3.10pm-4.10pm

H01 EMBED CAS TECHNIQUES INCLUDING PYTHON FOR PSEUDOCODE AND COMPUTATIONAL MATHEMATICS

Subtheme: Technology

Sanjeev Meston, Strathcona Girls Grammar
(Year 7 to Year 12)

The CAS (Computer Algebra Systems) techniques for pseudocode and computational mathematics session is tailored for teachers and professionals seeking to enhance their understanding, capabilities and proficiency in utilising computational tools for mathematical problem-solving. These skills will help them impart these learning skills to the students. Led by an expert in both mathematics and computer science, the session delves into the integration of CAS into pseudocode algorithms and computational mathematics as prescribed in V2.0 of Victorian / V9 of Australian curriculum and VCE Mathematics study design. Opportunities for hands-on exercises and coding to reinforce better understanding of CAS techniques and their applications in computational mathematics. The session will include a Q&A session. Overall, the CAS techniques for pseudocode and computational mathematics session will equip attendees with the knowledge, skills, and tools necessary to leverage CAS effectively for solving diverse mathematical problems efficiently and accurately.

Key takeaways:

1. The session will have an overview of computer algebra systems, explaining their role in performing symbolic mathematical computations, simplifications, and manipulations.

2. Learn to integrate CAS capabilities into pseudocode algorithms for solving mathematical problems.

3. Through practical examples, attendees explore how CAS can be utilised for symbolic manipulation and coding.

H02 HANDS ON! EMBEDDING THE PROFICIENCIES IN RICH INVESTIGATIONS

Subtheme: Pedagogy

Catherine Epstein-Rodgers, St Peter's East Bentleigh
(Year 3 to Year 6)

Square counters are an excellent hands-on classroom resource that can be used as a tool to empower and enable students to creatively investigate many areas of mathematics and solve problems. In this workshop we will look at tasks in all six strands and investigate how manipulations with 24 square counters can provide rich learning opportunities for students to reason, justify, connect ideas and draw conclusions to ultimately develop understanding. Within each exploration we will consider strategies to promote rich dialogue and how each task can be differentiated to enhance the learning.

Key takeaways:

1. Hands on investigations can encourage a higher level of engagement from your students.

2. Square counters can be manipulated to encourage reasoning, fluency, understanding and problem solving in all areas of the curriculum.

3. You will leave with a variety of investigations you can immediately explore with your students.

H03 PICTURE BOOKS - A SPRINGBOARD FOR EFFECTIVE MATHS TEACHING

Subtheme: Pedagogy

Sheila Griffin, SGM, Di Liddell, The Mathematics Association of Victoria
(F to Year 6)

Picture books are a springboard for creative and critical teaching where students can make strong mathematical connections between concepts and language. Picture books contain both imagery and dialogue that can ignite curiosity and in which teachers can create purposeful and innovative learning tasks. In this workshop, we will investigate how quality picture books can lead to tasks that develop deep mathematical understandings for our students. In addition, we will look at a range of tasks that utilise the mathematical proficiencies, effective pedagogies and assessment opportunities.

We will discuss thoughtful choices of picture books, considering students' academic and personal requirements and the lifelong students can make on our world.

Key takeaways:

1. Linking mathematics to literacy.

2. Highlighting how picture story book can be used to engage students into mathematical concepts.

3. Explore tasks linked to picture story books utilising the proficiencies

H04 EXPLICIT TEACHING WITHIN THE GUIDED INQUIRY MODEL

Subtheme: Pedagogy

Kris Westcott, Sackville Street Public School
(F to Year 6)

Rather than an either/or dichotomy, explicit teaching and inquiry can be complimentary and support deep learning. This workshop will explore the guided inquiry model and some of the explicit teaching routines that can be purposefully planned into inquiry lesson sequences. Participants will consider task design that allows for significant differentiation to meet the varied needs within all of our classes. The example used in this presentation has been used with Years 1 – 6 classes and aims to build conceptual understanding from counting, through additive, then multiplicative and proportional thinking.

Key takeaways:

1. Understanding of the guided inquiry model.

2. Routines for explicit teaching throughout the lesson cycle.

3. Possibilities for differentiation throughout the lesson cycle.

H05 THE BIG IDEAS IN NUMBER UPDATE

Subtheme: Curriculum

Dianne Siemon, RMIT University
(F to Year 8)

Not everything in the curriculum is equally important and not everything needs to be differentiated. This seminar will make a case for focusing on the Big Ideas in Number that research has shown make a difference to student learning outcomes and explore the recently updated Assessment for Common Misunderstandings (AfCM+) and Scaffolding Numeracy in the Middle Years (SNMY+) formative assessment resources.

Key takeaways:

1. Big ideas, number, assessment.

H06 SUMMING IT UP! EFFECTIVE STRATEGIES FOR SUMMARISING LESSONS.

Subtheme: Pedagogy

Hung Vo-Tran, Ashleigh Donoghue, Deer Park North Primary School
(Year 3 to Year 6)

Are you ready to elevate your teaching skills and make your maths lessons more impactful? Our hands-on workshop is designed to equip maths teachers with effective strategies for summarising lessons. Empowering mathematics teachers with knowledge of research, evidence-based and innovative practices for engaging students. Our team will share how to improve learning by anticipating student responses to problem solving, making meaningful selections of student work samples to help scaffold the learning, and knowing how to bring the learning together with a variety of effective summarising strategies. By the end of the workshop, participants will have a toolkit of techniques to confidently summarise their maths lessons, promote student engagement, and enhance overall learning experiences.

Key takeaways:

1. Clear understanding of problem solving structure.

2. A variety of ways to summarise your lesson.

3. Get a clear understanding of how to select your student work samples.

SESSION H: Friday, 3.10pm-4.10pm (cont.)

CANCELLED H07 WORKING MATHEMATICALLY WITH APSMO: COMMUNICATION AND COLLABORATION

Subtheme: Pedagogy

Yvette Semler, APSMO
(Year 3 to Year 6)

This workshop will explore and demonstrate the value of supporting students to become confident communicators, through evaluating, explaining and justifying their mathematical solutions. It will also provide insight into the role that collaboration plays in promoting and supporting the application of mathematical knowledge in different contexts, requiring students to share, evaluate and select from their collective skill set. Participants will explore teaching and learning techniques designed to encourage and assist students in constructing arguments and supporting reasoning. In small groups, they will engage with a variety of challenging and stimulating mathematical problems that necessitate the application of mathematical reasoning.

Key takeaways:

1. A framework to develop tasks that promote and support mathematical reasoning.

2. Teaching techniques that assist students to collaboratively solve mathematical challenges.

3. A role-play experience of participating in (and solving) a stimulating mathematical problem.

H08 THE AFFORDANCES AND CONSTRAINTS OF DIGITAL AND NON-DIGITAL MATHEMATICAL GAMES

Subtheme: Pedagogy

Toby Russo, Fitzroy North Primary School, James Russo, Monash University
(F to Year 6)

Despite digital maths games being ubiquitous for at least a generation, many primary school teachers continue to prefer to use non-digital games to support mathematics instruction. Is it that most of these teachers are Luddite's who oppose technology on principle, or do they have deeper, pedagogically-based reasons for preferring non-digital games?

In this workshop, we will explore the affordances and constraints of each game mode and share our recent research examining how and why teachers prefer to use either digital or non-digital games. Teachers will have an opportunity to play both digital and non-digital modes of games that are functionally similar and reflect on whether they feel they have the 'balance right' in their current practice.

Key takeaways:

1. Teachers will leave with knowledge of research, as well as a personal experience, focussed on the affordances and constraints of digital and non-digital maths games;

2. Teachers will have an opportunity to reflect on game mechanics and be armed with several new games in their teaching repertoire

H09 SMART (SPECIFIC, MEASURABLE, ACHIEVABLE, RELEVANT AND TIMELY) GOALS IN MATHEMATICS = STUDENTS' SUCCESS

Subtheme: Wellbeing

Jennifer Sze, Faculty of Education, The University of Melbourne
(F to Year 12)

In this presentation, I will be discussing the vital role of engaging students in setting Specific, Measurable, Achievable, Relevant and Timely (SMART) Goals. Goal setting underpins the vital role of growth mindset as advocated by Professor Jo Boaler. Boaler's growth mindset in mathematics is based on the idea that intelligence and mathematical ability are not fixed traits. These traits can be developed through careful intervention by teachers through effort and supportive learning environment. Literature has shown that growth mindset and setting goals in mathematics empowers students to develop their abilities and to achieve their fullest potential. Through these dialogues, teachers wield language strategically, fostering active engagement with learning objectives. As their teacher, I guided the students in setting their precise daily learning objectives, with the overarching goals of enriching their involvement and confidence in mathematics. The goal-setting approach bolster my students' commitment to achievement-oriented behaviour.

Key takeaways:

1. Growth mindset in mathematics is based on the idea that intelligence and mathematical ability are not fixed traits.

2. These traits can be developed through careful intervention by teachers.

3. The goal-setting approach bolster students' commitment to achievement-oriented behaviour in mathematics.

H10 FROM MANAGING TO LEADING: A MATHEMATICS LEADERSHIP CONTINUUM

Subtheme: Leadership

Kate Copping, Faculty of Education, The University of Melbourne
(F to Year 10)

Do you feel like you're managing your team, rather than leading? This session will explore the role of a mathematics leader and where their responsibilities lie on a continuum from managing to leading mathematics. To support the development of your mathematics leadership and the transition from managing to leading, you will have the opportunity to reflect on your own role. You will consider where you are positioned on the continuum, how this will impact your work, and set goals for your professional growth.

Key takeaways:

1. Understanding the role and responsibilities of mathematics leader.

2. Analysing where you are in your mathematics leadership development.

3. Goals for your future development as a mathematics leader.

H11 MODELLING USING DIGITAL TECHNOLOGIES IN YEARS 5 TO 10.

Subtheme: Curriculum

Sebastian Sardina, RMIT University, Max Stephens, The University of Melbourne
(Year 5 to Year 10)

The Victorian Curriculum: Mathematics V2.0 encourages teachers and students to engage in modelling, especially including the use of digital technologies. This provides a ready bridge to STEM activities where mathematics can play a key role. This workshop will present a Scratch-based physics modelling exercise suitable for the upper primary and junior secondary years. Starting with simplified setting, the modelling activity will simulate the motion of a bouncing ball. Progressively, initial assumptions will be lifted, and the Scratch code elaborated. According to students' interests and abilities, the modelling process can become more realistic, drawing on students' knowledge of positive and negative numbers, ratios and percentage to represent changes in speed and direction. Additional digital resources to support graphics and design will be included to maximise STEM engagement.

Key takeaways:

1. Links to STEM and digital technologies.

2. Scratch based physics modelling.

3. Supporting graphics and design.

Remember: Laptop with access to Scratch programming.

H12 LINEAR ALGEBRA – BUILDING UNDERSTANDING

Subtheme: Pedagogy

Mark Ljubic and Keegan Blows, St. Joseph's Secondary College
(Year 7 to Year 10)

In this session, Mark will draw upon his 30 plus years of secondary mathematics teaching experience as he explores the formative stages when students are first introduced to linear algebra in high school. Unfortunately, for some learners, the mere mention of the word 'algebra' conjures up feelings of trepidation and fear. This may also be true for the parents as they may be suffering Generational Algebraic Poverty Syndrome (GAPS) from their past learning experiences. Well, it is time to change that narrative as during this session we will explore:

- Building practical linear models – using paddle pop sticks and counters.
- Building understanding of graphing and the development of a mathematical model.

I will not frighten students with y = mx + c at this formative stage. Come along and have a bit of fun exploring linear models.

SESSION H: Friday, 3.10pm-4.10pm (cont.)

Key takeaways:

1. Ideas to build a linear model.

2. A few online resources that can be used.

3. A short assignment (in word format) that can be readily used.

Remember: Please bring a positive attitude and a curious mindset.

CANCELLED H13 OVERCOMING DIFFICULTIES WITH TEACHING ANGLE AS A SPATIAL STRUCTURING TOOL

Subtheme: Pedagogy

John Lawton, Deakin University
(Year 5 to Year 8)

When the different facets of the complex concept of angle are integrated in students' thinking it becomes a powerful tool for spatial structuring. This is key to success with geometry, measurement, and numeracy. Victorian teachers are expected to overcome student difficulty with static representations of angle by introducing the concept initially as turn. Teachers in the author's survey see this as problematic for students, believing at Grade 7 that 62% of their students are unable to conceive of angle as a turning between two lines. This survey mapped teachers' definitions and concept images for angle, finding that they lack integration. In this session we discuss classroom results from a lesson approach which challenges the current curriculum. This approach, building on classroom research by White & Mitchelmore (2010), aims to give students a concept image for angle that they can successfully project onto any object or activity to understand its structure.

Key takeaways:

1. Understand the different definitions and concept images that the 43 teachers in the author's research survey employ for angle in their classrooms.

2. Understand, and critically evaluate, how the Victorian curriculum expects student concept image for angle to evolve.

3. Evaluate an alternative, and potentially more successful, teaching approach for angle.

H14 MASTERING GEOMETRY: OVERCOMING MISCONCEPTIONS WITH EFFECTIVE TEACHING AND LEARNING

Subtheme: Pedagogy

Michael Nelson, Mike Nelson Maths and Drysdale Primary School
(F to Year 8)

Research indicates that students have a surface understanding of geometry, which impacts their ability to work with more complex concepts at secondary levels. In this presentation, educators will look at the common misconceptions that hold students back and how we can practically implement high-quality teaching of geometry to allow students to have a deep conceptual understanding of the topic. We will also explore rich assessment tasks that allow us to pinpoint student understandings and how we can modify our learning programs based on this assessment.

Key takeaways:

1.Practical approaches to teaching geometry the class

2.Formative and summative assessment tools to help teachers identify student understanding

H15 CRACKING THE PSEUDOCODE: TEACHING ALGORITHMS FROM A STUDENT PERSPECTIVE

Subtheme: Pedagogy

Lianna Beeching and Amanda Fan, Preston High School
(Year 5 to Year 12)

Boost your content knowledge and confidence in teaching algorithms and pseudocode! Experience different research-informed strategies and activities to teach algorithms from a student perspective, building a solid toolkit to take into the maths classroom.

In this session, we will:

- Build content knowledge around algorithms in a maths context.
- Link to the algorithms and pseudocode content in the Vic Curriculum 2.0 and in VCE Maths.
- Experience multiple pedagogical approaches to teaching algorithms from a student perspective.

- Explore the kinds of scenarios where each strategy would shine based on your context and students.

Key takeaways:

1. Solid content knowledge and confidence in using algorithms and pseudocode.

2. A toolkit of research-informed pedagogical approaches and strategies for teaching algorithms.

3. Understanding of how algorithmic thinking develops through the Vic Curriculum 2.0 levels and into pseudocode in VCE.

Remember: Please bring a laptop that can connect to the internet, we will check out some websites that offer block-coding options.

H16 WHERE IS THE EXPLICIT TEACHING IN LAUNCH, EXPLORE, SUMMARISE?

Subtheme: Pedagogy

Jessica Kurzman, St Patricks Primary School, Renee Ladner, The Mathematical Association of Victoria
(F to Year 8)

Guided student inquiry, known as the Launch, Explore, Summarise instructional model, often comes with confusion about where explicit teaching fits. Let us guide you through an interactive lesson where we will focus on spotlighting students' thinking and reflect on the importance of anticipating what you would be looking for then leading to the summary phase where the explicit teaching fits. We will demonstrate how key concepts are clarified, misconceptions addressed, and new knowledge explicitly imparted within these lessons. We will highlight the strategies for implementation in your own classroom and show you how educators can effectively integrate explicit teaching within the Launch, Explore, Summarise instructional model, ensuring that students receive targeted support while engaging in meaningful exploration and discovery.

Key takeaways:

1. Clarity on where explicit teaching fits within guided student inquiry.

2. Strategies for spotlighting student thinking and anticipating their needs.

3. Practical methods for integrating explicit teaching into the Launch, Explore, Summarise model.

H17 DEVELOPING MATHEMATICS LEADERS

Subthemes: Pedagogy, Leadership

Peter Burrows, EdPartnerships International
(F to Year 6)

Understanding the depth and breadth of knowledge, know-how and professional practice needed for teachers to develop into and become effective mathematics leaders will be the focus of this presentation. It will build on the work of Lee Shulman, who identified an essential overlap between teacher pedagogical knowledge and mathematical content knowledge, which he identified as pedagogical content knowledge. The presentation will tap into the presenter's experiences of co-designing and facilitating professional learning for participating primary school teachers in the maths focused stream of the Victorian Department of Education's PMSS initiative. It will explore the question:

What might it really take to develop mathematics leaders?

At the heart of this presentation will be a graphic representation, or map, of the developmental territory which the presenter will propose mathematics leaders need to navigate, immerse themselves, understand and act on. The territory depicted via the map is multi-dimensional, multi-layered and interconnected.

Key takeaways:

1. A single page representation of the developmental territory that prospective maths leaders will need to navigate and embrace to grow into their roles.

2. An illustration of a developmental trajectory for maths leader in the context of an initiative designed to achieve sustained school-wide improvement in mathematics (PMSS).

3. Insights from PMSS participating teachers and Principals.

SESSION H: Friday, 3.10pm-4.10pm (cont.)

H18 PROVOKING MATHEMATICAL REASONING: A TALE OF TWO TEACHERS

Subtheme: Pedagogy

Matt Skoss, NT Dept of Education, Paul Howard, St Ignatius College
(Y5 to Y10)

This session will model practical mathematical tasks the presenters have successfully used to foster a culture of mathematical conjecturing, reasoning and justifying. They will talk about the process of 'letting go' of control in the classroom to give students agency in approaching their mathematics. Matt and Paul met as classroom teachers in Alice Springs (high school and primary school settings), and have shared resources, ideas and experiences since 2006. Some of their favourite rich tasks will be modelled as if we were in the classroom. Come prepared to be 'a student' along with participating in the 'meta-talk' of the pedagogical nuances.

Key takeaways:

1. Practical tasks to challenge students' mathematical thinking.

2. Strategies to vary tasks to raise the challenge.

3. Photos to share with colleagues back at school.

H19 THE PROFICIENCIES ARE KEY

Subtheme: Curriculum

Em Thompson, Monash University, School of Mathematics
(Year 3 to Year 12)

In this talk I will examine the 'proficiencies' and 'processes' described in the Victorian Curriculum 2.0 and discuss what each of them mean to me, as a mathematician. I will share my understanding of what makes a person mathematically capable, highlighting aspects of the curriculum that I feel are non-negotiable in attaining this. On the other hand, I'll reflect on aspects of the curriculum that I believe are in some sense negotiable. We'll consider the vastness of mathematics and question why it is that certain topics have become standard in school curriculum when others have not. Along the way, I will distil some of the values and practices of mathematicians, and how they can be modelled in the mathematics classroom.

Key takeaways:

1. Increased appreciation for the tangible skills described by the proficiencies.

2. Motivation to engage critically and creatively with the content descriptions.

3. Insight into the values that guide research mathematicians.

H20 THIS WAY AND THAT, TRANSFORMATION, FUNCTIONS, AND INVERSES

Subtheme: Pedagogy

Shelley Pendlebury, John Paul College, Jotishma (Joy) Singh, Nazareth College
(Year 9 to Year 12)

This way and that, transformation, functions and teaching inverses of functions using TI-Nspire CXII and other creative ideas. Incorporating both hands-on activities and utilising the power of the TI-Nspire CXII CAS to investigate transformation of functions and inverses of relations and functions. Use tables, graphs, lists, parametrics, and draw features to illustrate each concept. Experience algebraically why expressions are inverses. Ideal for teachers of 10/10A (Victorian Curriculum 2.0) and Mathematical Methods.

Key takeaways:

1. Activities to use in the classroom designed to improve students understanding of functions, transformations, and inverses.

2. Ideas and skills for using the CAS in teaching and learning of functions, including using parametric equations, geometry menus, function notation, tables and graphs.

Remember: The TI-Nspire CXII CAS will be demonstrated, participants would benefit from bringing their own TI-Nspire CXII CAS calculator or software to the session.

H21 DEVELOPING COMPETENCY-BASED ASSESSMENT RUBRICS IN THE MIDDLE YEARS.

Subtheme: Pedagogy

Mark Grasso, Bialik College, Matthew Vicendese, Templestowe College
(Year 7 to Year 10)

Competency based assessment rubrics in mathematics can have a range of effects on teaching and learning. From improved student outcomes, assessment and reporting practices and the identification of necessary support or extension, these rubrics, can enable students to best select their pathway as they navigate their choices in VCE mathematics. In this session, we will aim to construct several competency-based rubrics, and their corresponding assessments. Including topics such as linear algebra, quadratic algebra, probability and statistics, and indices, surds and logarithms. These rubrics will encompass the relevant curriculum and key knowledge from several curriculum levels, aimed at being a continuum for student learning. In addition to these rubrics, we will analyse several assessments, and how they align with the rubrics, ensuring accessibility and extension for all students.

Key takeaways:

1. Confidence in navigating curriculum documentation.

2. Identifying key knowledge, and their place in a learning continuum.

3. Construct a competency-based rubric for a topic, or selection of topic for a range of levels.

Remember: Please bring a laptop with Microsoft Excel, or Google Sheets.

H22 GENERAL MATHEMATICS EXAMS: USING THE CAS CALCULATOR EFFICIENTLY AND EFFECTIVELY

Subtheme: Technology

Kevin McMenamin, Mentone Grammar
(Year 9 to Year 12)

This session will look at questions from this year's General Mathematics papers and discuss how useful the CAS calculator was in assisting the students in finding a solution. This would be particularly useful to teachers who are new to the subject and teaching for the first time.

The session offers a hands-on experience that will give you the opportunity to use the calculator just like the students on all the questions where it would be most beneficial. The session is open to TI-Nspire and ClassPad users and the featured calculator will be the Casio ClassPad

Key takeaways:

1. Familiarisation of an approved CAS technology.

2. Applications of CAS functionality in a VCAA Examination.

3. Exposure to efficient approaches to solve and investigate questions thorough the use of a CAS technology.

Remember: Bring your preferred CAS calculator to have the opportunity to try some of the presented applications.

H23 MIXING IT UP WHILE KEEPING THINGS IN PROPORTION

Subtheme: Pedagogy

David Leigh-Lancaster, Leigh-Lancaster Consulting
(Year 7 to Year 12)

Many real-life problems involve ratios, proportions, rates, and percentages, which can be challenging for both students and adults alike. In this interactive session, we will start with a practical problem and then use a variety of examples to progressively unpack a set of approaches that can help make this topic more accessible for students. Throughout the session, we will cover related concepts, skills, and processes for these topics across Years 7–10.

Key takeaways:

1. Approaches to modelling and solving problems involving ratio, proportion, rates and percentages.

2. A collection of related activities and resource links.

3. A progression of key concepts,skills and processes for learning about ratio, proportion,rates and percentages across Years 7 – 10 of the Victorian Curriculum V2.0.

Remember: Participants should have access to a scientific calculator.

SESSION H: Friday, 3.10pm-4.10pm (cont.)

H24 MATHEMATICAL MODELS THAT MEASURE OUR WORLD

Subtheme: Curriculum

Kaye Stacey, The University of Melbourne
(Year 7 to Year 12)

When we think of measurement, we usually think about measuring physical quantities such as temperature or length. But every day, we use measures for many other 'quantities' such as the star rating for healthiness of food, GDP, BMI, biodiversity, social inequality or the infectivity of a disease. These are mathematical models, used to understand and make predictions about the world. Defining a measure mathematically enables data collection, identifying relationships to other variables and making predictions about the future. The Victorian Curriculum (Mathematics) 2.0 describes mathematical modelling as a key to informed and participatory citizenship. But this requires a fuller appreciation of mathematical modelling than applying known techniques to already mathematised situations. In this session, we consider examples of mathematical models commonly used in everyday life or science, examine what makes them good, and discuss how students can learn how experts and citizens can use these mathematical models to make good decisions.

Key takeaways:

1. Most people do not create mathematical models, but we all use them.

2. Mathematical models give us the best-known way to predict aspects of the future but might be wrong.

3. Understanding how mathematical modelling is used in society is an important outcome of learning mathematics.

H25 REAL TRIGONOMETRY USING REAL-TIME REAL-WORLD DATA

Subtheme: Technology

Enzo Vozzo, Mentone Grammar
(Year 9 to Year 12)

Flightradar24, a popular plane tracking app, gives users access to a flight's real time data such as speed, altitude, track, latitude and longitude. Using plane and spherical trigonometry, this real-time, real-world data can be used to calculate and confirm that the speed and track of a flight are correct using four different methods. Three methods involve plane trigonometry, and these will depend on particular aspects of a flight: Method 1 deals with flights that are travelling due north or south, Method 2 deals with flights that are travelling due east or west, Method 3 deals with flights near the equator travelling in any direction. Method 4 uses spherical trigonometry and is the method that is actually used by flights. The theory behind each method will be discussed along with worked examples. All these calculations can be done on a CAS calculator or on a spreadsheet.

Key takeaways:

1. A practical application of the use of trigonometry.

2. Great for students who want to be pilots.

3. The use of a spreadsheet and or CAS calculator to perform trigonometric navigation calculations.

Remember: Delegates should be familiar with the app Flightradar24 and have it installed on their mobile phone.

H26 OUR JOURNEY THROUGH IMPROVING OUR TEACHING OF MATHEMATICS

Subtheme: Pedagogy

Timothy Ross, Jaswinder Kaur and Emily Beale, Woodmans Hill Secondary College
(Year 7 to Year 10)

At Woodman's Hill Secondary College, we have implemented collective teacher efficacy to improve the way mathematics is taught at our school. Through weekly check-ins, data analysis, and relentless hard work, we have successfully transformed our classrooms to meet students at their individual points of need, fostering growth regardless of their initial abilities in mathematics. This reflective approach has been instrumental in driving our progress and identifying areas for improvement as a team.

Key takeaways:

1. Importance of responding to student data.

2. Possible starting points for differentiation in your classroom.

3. Implementation of school-wide change in mathematics teaching.

H27 BUILDING NSPIRATIONS

(COMMERCIAL PRESENTATION)

Subtheme: Technology

Peter Fox, Texas Instruments
(Year 9 to Year 12)

Are you ready to elevate your TI-Nspire skills and create captivating educational content? In this hands-on workshop, you will learn some of the secrets behind creating interactive, engaging, and dynamic TI-Nspire documents. This session is not for the faint hearted, we will be creating animations, dynamic diagrams that allow you to automatically capture data and much more. Get ready to transform student learning experiences. Bring your laptop with the teacher software installed and join in on this unforgettable journey!

Key takeaways:

1.Create your own interactive digital content.

2. Improve your TI-Nspire skills.

3. See how to increase student engagement and understanding.

Remember: Laptop. Content will work on student calculators, but is easier to create on a computer.

FULL H28 DESIGNING MATHEMATICAL INVESTIGATIONS FOR UPPER SECONDARY

Subtheme: Pedagogy

James Mott, Southern Cross Grammar
(Year 9 to Year 12)

The VCE Mathematics study design for the 2023-2027 accreditation period stipulates that mathematical investigations are to be incorporated within Unit 1 and 2 Mathematical Methods, which will require students to utilise technology to engage in exploration, conjecture and generalise results. Additionally, the Australian Curriculum 9.0 states that students, by the end of Year 10, should 'experiment with functions and relations, using digital tools, making and testing conjectures and generalising emerging patterns'. In this session, attendees will be exposed to strategies for designing mathematical investigations to support generalisation within Year 10 and Unit 1 and 2 Mathematical Methods. Attendees will explore sample 'starting points' and discuss how such tasks could be adapted to suit their school context.

Collaboration amongst attendees will occur in this session, and attendees are encouraged to come with ideas to share. TI-Nspire will be used in the workshop. Attendees are encouraged to bring their own CAS device.

Key takeaways:

1. Ideas for designing and implementing a mathematical investigation.

2. Learning how TI-Nspire CAS can be leveraged to facilitate investigation.

Remember: Participants are encouraged to bring their own CAS device. Spare TI-Nspire CAS handheld calculators will be available to borrow during the workshop.

PRESENTER LIST

Nadia Abdelal: C11
Penny Addison: KT04
Crystal Afitu: E11
Ben Allen: A09
Duane Anderson: A22
Leonie Anstey: KT05, B19, F03
Kathryn Arnold: C12
Milton Bai: B15, E26
Alana Bandholz: E07
Emily Beale: H26
Len Bedier: E28
Lianna Beeching: H15
Keegan Blows: H12
Vito Boglietti: F28
Jennifer Bowden: G10
Paul Bowyer: C16
Stephen Broderick: E25
Jill Brown: KF04, E17
Jacinta Browning: B08
Peter Burrows: H17
Kate Buzaglo: G06
Scott Cameron: E15
Kayla Campbell: B07
Dean Carmody: A14
Katherin Cartwright: KF01, E03
Marissa Cashmore: F01
Helen Chick: B01
Michael Cini: E07
Jacqueline Clark: B08
Doug Clarke: KT01, A19
Luke Clift: F15
Molly-Rose Clifton-Williamson: F05
Jo Clyne: G23
Celia Coffa: B13
Peter Collins: F23
Kate Copping: B12, H10
Elise Copsey: G04
Narcisa Corcaci: C23, F27
Ellen Corovic: F18
Kristyn Cram: F17
Maree Croft: C18
Lucas Cruz Rocha: A22
James Dann: KF03, E23
Nikki D'Antonio: C06
Aylie Davidson: C19
Alex de Lacy: A12
Beth Dean: G06
Ramya Deepak Kumar: B06, G17
Shane Dempsey: E22
Cathy Devlyn: B21
Liz Dewar: C18
James Dixon: B06, G17
Ashleigh Donoghue: H06
Allan Dougan: G14
Danijela Draskovic: B10
Cory Duker: E24
Jayaseelan Durairaj: C25
Kate Eastcott: B04
Michaela Epstein: A10, G16
Catherine Epstein-Rodgers: G02, H02
Amanda Fan: H15
Stephanie Felix: C05
Zahara Forte: E11
Peter Fox: A20, C17, F25, H27
Kara Fox: A22
Connie Galati: C13
Michelle Galli: C22
Lee Gianfriddo: E11
Mark Gleeson: F12
Greta Gomes: G26
Georgia Gouros: F24
Penne Grant: E10
Mark Grasso: H21
Anita Green: G07
Adele Gregson: G06
Sheila Griffin: H03
Vanessa Grossi: F05
Echo Gu: F26
Donna Guise: E08
Michelle Hackett: B22
Scott Hamilton: F17
Lana Harris: C02
Tom Harris: G23
Zahra Harvey: F07, G01
Julia Hill: KF03, E09
Lindsay Hill: G27
Brendan Hodge: B07
Lisa Hogan: B22
Marj Horne: B02, E20
Samantha Horrocks: C08
Paul Howard: H18
David Howes KT04
Jane Hubbard: A14, C04

Miao-Hsuan (Felicity) Hung: B25
Toan Huynh: G27
Naomi Ingram: KT03, A24
David Innes: E19
Chris Ireson: E28
Elizabeth Irwin: C14
Jason Jin: E27
Jaswinder Kaur: H26
Bernard Kerrins: B05
Jessica Kurzman: B16, H16
Renee Ladner: B03, E01, H16
Vincent Lam: F21
Brian Lannen: A26, B11
Antje Leigh-Lancaster: A13, F14, G02
David Leigh-Lancaster: C27, H23
Di Liddell: H03
Eamon Light: G18
Katharine Lin: G24
Wenting Liu: G21
Sharyn Livy: G11
Mark Ljubic: H12
Bernadette Long: A07
Andrew Lorimer-Derham: G09
Cassandra Lowry: G03
Julian Lumb: C28
Alastair Lupton: B20, G22
Michael MacNeill: KT04
Hannah Marino: C04
Russell McCartney: C01
Lorna McClory: E10, G20
Mark Mclay: KF03
Kevin McMenamin: C26, H22
Allason McNamara: B21
Geoffrey Menon: C20
Carmel Menzies: A04
Bernadette Mercieca: C13
Carmel Mesiti: B12, E15
Sanjeev Meston: B23, H01
Jodie Miller: KF02
Michael Minas: F13
Rohani Mohamad: KF03
Robert Money: G13
Chrissy Monteleone: KT02, A02
Emma Moore: A09
James Mott: E22, G26, H28
Jessica Mount: A27
Frank Moya: B26
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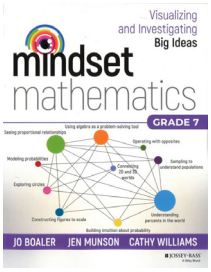

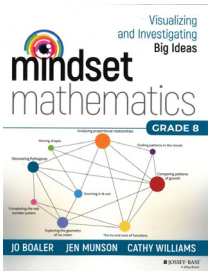

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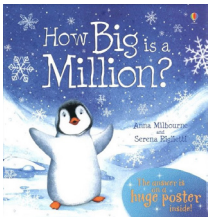

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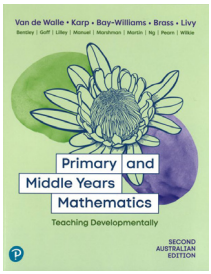

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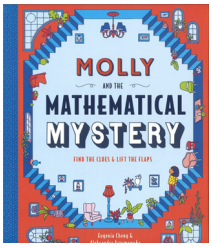

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