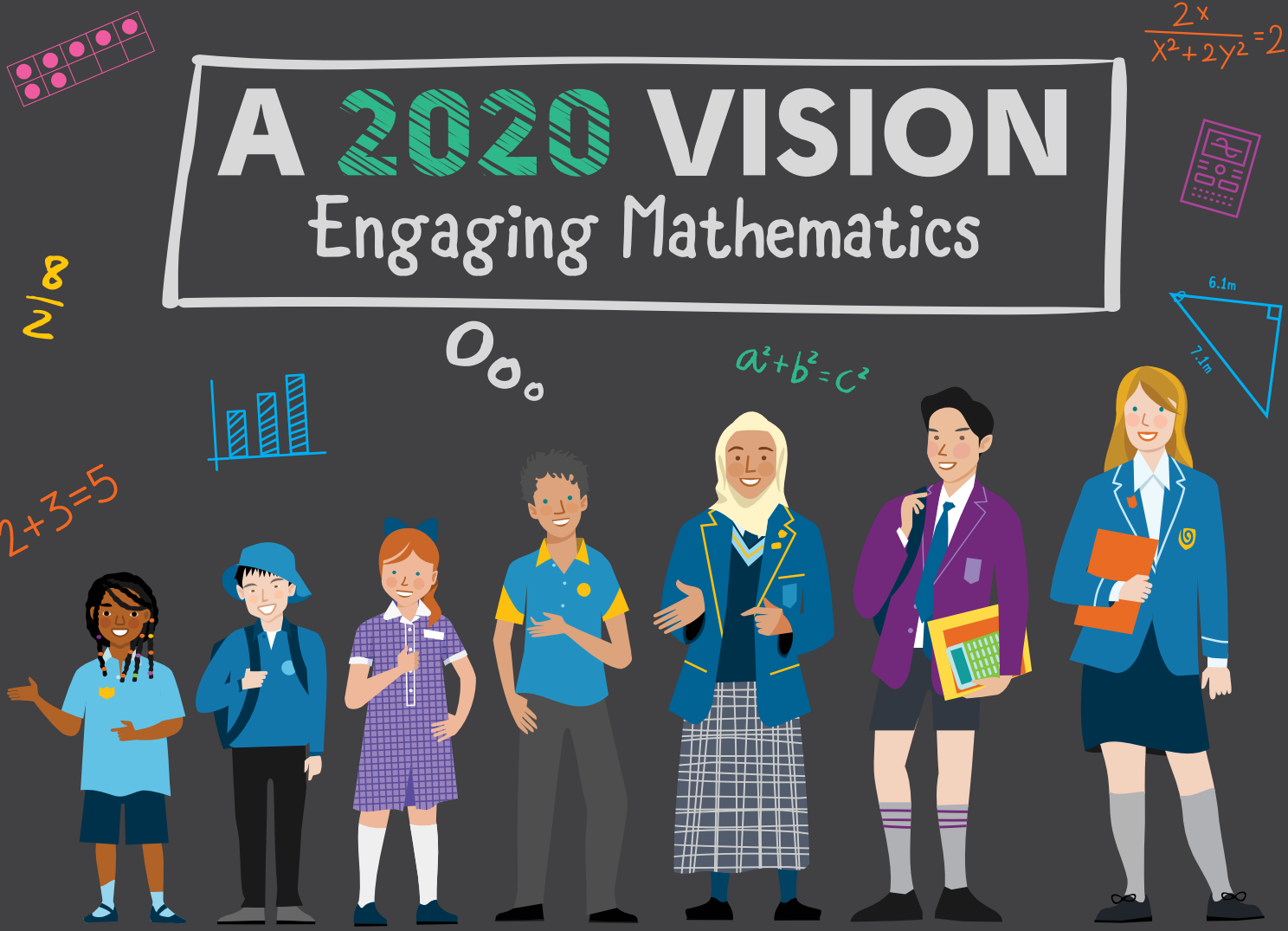
THE MATHEMATICAL ASSOCIATION OF VICTORIA

MAV20 CONFERENCE

3-4 DECEMBER

A 2020 VISION
Engaging Mathematics



CONFERENCE SYNOPSIS

57th Annual Conference

Streamed live & On Demand

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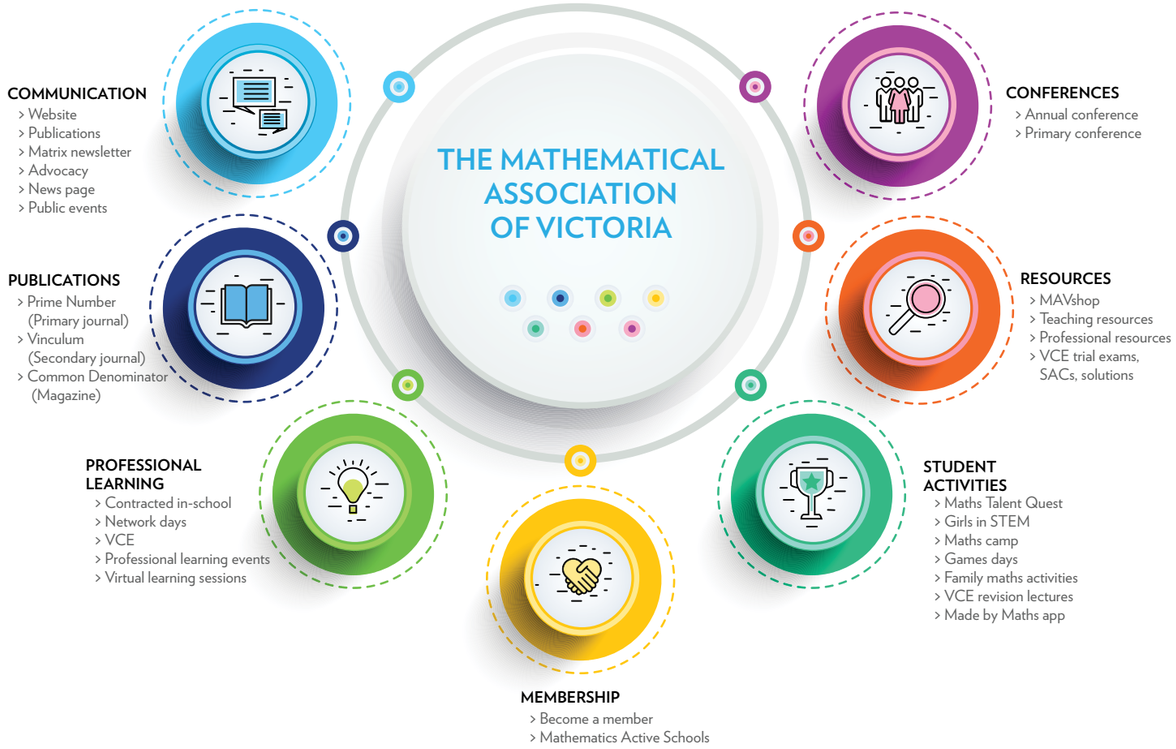
mav.vic.edu.au

THE MATHEMATICAL
ASSOCIATION OF VICTORIA



WELCOME TO MAV20

Welcome to MAV20 – A 2020 Vision: Engaging Mathematics

The last few months have been a period of change and challenge for all of us and in particular teachers within Victoria. As like many other associations we considered cancelling our annual conference due to the uncertainty surrounding COVID19. However, with the support of MAV Board, MAV events team and the conference committee I am pleased to invite you to the 57th Annual Virtual Conference (MAV20) from Thursday 3 to Friday 4 December 2020.

We all experience mathematics differently; some of us are confident, others suffer from maths anxiety, and many of us sit between these two extremes. What is your story? How do you engage in mathematics?

How can we as a community: ignite students' passion for, and value of, mathematics; engage and support colleagues' professional growth; and engage and inform the community as a whole? Let's create a 2020 vision to share the positive skills and attributes that mathematics can provide for future generations.

At the heart of MAV's Annual Conference are teachers. Each year over 1400 mathematics educators including teachers, academics, policy makers, curriculum experts and resource developers come together to share their collective expertise, experiences, and ideas. That's what makes our conference great!

Join us online to share your ideas, stories, and enthusiasm for engaging in mathematics.

- Ann Downton, Conference Convenor

CONTENTS

SCHEDULE

Thursday 3 December 2020	
9am-9.15am	Opening and welcome
9.15am-10.15am	Keynote presentations
10.15am-10.25am	Coffee break
10.25am-11.10am	Sessions
11.10am-11.20pm	Coffee break
11.20am-12.05pm	Sessions
12.05pm-12.15pm	Coffee break
12.15pm-1pm	Sessions
1pm-1.45pm	Lunch and networking
1.45pm-2.30pm	Sessions
2.30pm-2.40pm	Coffee break
2.40pm-3.25pm	Sessions
3.30pm-4.30pm	Happy hour, virtual drinks
Friday 4 December 2020	
9am-9.15am	Opening and welcome
9.15am-10.15am	Keynote presentations
10.15am-10.25am	Coffee break
10.25am-11.10am	Sessions
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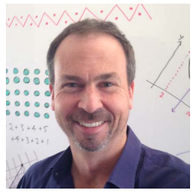
KEYNOTES

PRESENTERS



JAMES TANTON

EXPLODING DOTS: A GLOBAL PHENOMENON

Primary and secondary

James Tanton (PhD, Princeton 1994, mathematics) is an author, a consultant, and an ambassador for the Mathematical Association of America in Washington D.C., currently serving as their Mathematician-at-Large. He has taught mathematics both at university and high school. James is absolutely committed to promoting effective and joyful mathematics thinking, learning, and doing at all levels of the education spectrum.

James writes books and video courses, advises on curriculum, consults with teachers, and gives demonstration classes and professional development sessions across the globe. He created the MAA's Curriculum Inspirations project, serves as chair of the Advisory Council for the National Museum of Mathematics in New York, and is a founder of The Global Math Project, an initiative set to transform the entire world's perception of what mathematics can and should be. Over 6 million students across the planet have taken part in a common joyous piece of mathematics to see classroom mathematics as a portal for human joy, wonder, and delight.

James grew up in Adelaide, Australia, and now lives in Phoenix, Arizona.

Dr Tanton's keynote presentation is supported by

VICTORIA State Government | Education and Training

LEICHA BRAGG

TEACHING MATHEMATICS FOR SOCIAL JUSTICE

All levels

Leicha Bragg is a Senior Lecturer in Mathematics Education in the Faculty of Arts and Education at Deakin University, Melbourne. Her extensive experience in mathematics education incorporates improving mathematics education through innovative and engaging approaches.

Dr Bragg has been the recipient of multiple teaching awards, including an Australian Learning and Teaching Council Citation Award for Teaching Excellence, "For outstanding curriculum and resource development that equips our future mathematics teachers with the confidence, passion and skills they need to support student learning." Her interest in making mathematics come alive saw her undertake research in implementing mathematics games in the primary classroom. Dr Bragg's current research includes mathematical reasoning, the creation of rich mathematical tasks through the use of children's literature, social justice, and mathematics.

ANN GERVASONI

A VISION FOR ENGAGING ALL CHILDREN AND FAMILIES IN MATHEMATICS LEARNING

Early years

Ann Gervasoni is Associate Professor of Numeracy at the Faculty of Education, Monash University in Melbourne. Ann has worked in educational research, teacher education, professional learning, and primary teaching for 38 years. She was a member of the research team for the Australian Early Numeracy Research Project (1999-2001) in Victoria, and research director for the Bridging the Numeracy Gap project in Western Australia and Victoria (2009-2010). Ann's research and scholarship focuses on mathematics education in early childhood and primary education, mathematics intervention approaches for students who experience difficult, and family-based and community approaches for supporting the learning of those most vulnerable in our community.

This keynote presentation is supported by

MATHS PATHWAY

ADAM KRUGER AND SCOTT RUMBLE

TEACH LIKE A STAR

Secondary

Adam Kruger (Head of Mathematics Faculty, Wesley College, Glen Waverley) and Scott Rumble (Senior School Leader, Parkdale Secondary College) have been involved in mathematical professional development for a number of years. Both working in a number of roles from Mathematics Learning Area leaders, Numeracy Leaders, Curriculum Development, Year Level Coordinator, Senior School Leader, to Acting Assistant Principal (Senior School/Curriculum). They have also been Directors of the Casey and Cardinia Mathematics Network.

Both believe that teaching and leading with warmth and enthusiasm, looking at the personal interests and strengths of their students is a key to achieving great success. Their interest, experience, and expertise in educating students at all levels is reflected in their broad teaching and leadership career. Both are celebrated presenters who work extensively with students, teachers and organisations in areas of leadership, data analysis, numeracy and literacy development, effective feedback strategies, restorative justice practices, accelerated learning, building connections outside the classroom, creative and critical thinking, learning styles, multiple intelligences and cooperative learning.

Adam and Scott have presented on numerous occasions for a range of organisations and school associations with the main focus of developing change in the classroom. Their passion for teaching has been the main driver for developing a range of programs at their college. The student growth that is achieved not only within these programs but in their classrooms is undeniable proof that their hard work and a love of this profession are the building blocks of great success. Adam and Scott have recently began developing a book *Teach like a STAR* which will be the driving force behind using their popular STAR methodology and approach towards building positive change in the classroom.

Adam and Scott's keynote presentation is supported by

OXFORD UNIVERSITY PRESS AUSTRALIA & NEW ZEALAND

CARLY SAWATZKI

A NEW VISION FOR A FINANCIALLY CAPABLE CITIZENRY: THE ROLE OF MATHEMATICS EDUCATION

Secondary

Dr Carly Sawatzki is interested in how young people become financially capable within families, communities, and schools. She is rapidly gaining national and international recognition for her ongoing research, which focuses on the design of financial mathematics tasks that reveal how young people think, feel, and respond to money-related problems.

Through her work in the field, Carly has found that children's financial decisions can be influenced as much by social and cultural factors (values, expectations, emotions, and experiences with money) as the formal curriculum. However, well-designed learning experiences that facilitate practice in rational, self-regulated financial problem-solving and decision-making seem to be impactful. Carly has published in prestigious international journals and led curriculum and research consultancies for Australian government agencies. She is regularly engaged by teacher associations, being recognised as a dynamic, thought-provoking presenter who challenges thinking, promotes critical conversation, and inspires innovation. Carly writes for The Conversation and EduResearch Matters and is regularly interviewed by ABC Radio. Carly works at Deakin University.

PAUL SWAN

MAXIMISING THE NATURAL CURIOSITY OF YOUNG CHILDREN: LEADING TO ENGAGEMENT

Early years

Dr Paul Swan is a mathematics educator who works around Australia and the world, although being based in Western Australia. He is an award-winning author, game designer and consultant who works with leaders and teachers to promote the best outcomes for children. One of his grandchildren has started Pre-school (Prep) and so he is keenly interested in harnessing the enthusiasm and excitement for learning that she shows.

TONY VALLANCE

AGENTS OF CHANGE - BUILDING STUDENT AGENCY IN MATHEMATICAL LEARNING

All levels

Tony received the Australian Education Awards Teacher of the Year (2019), he is a STEAM teacher and massive nerd.

Tony believes that ownership and agency are the key to learning and that is why he involves his students in leadership roles in creating, reviewing, and implementing initiatives and curriculum. Tony's passion is to motivate, engage and empower students so that they can apply their skills and confidence to any situation that life throws at them.

Tony was the winner of Teacher of the Year at the Australian Education Awards in 2019 and finalist for Outstanding Secondary Teacher of the Year – Victorian Excellence in Education Awards in 2018. He has two boys and has recently purchased an electric skateboard.

PANEL: SECONDARY

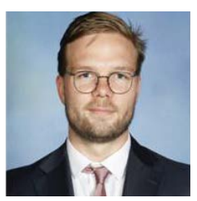
ONLINE TEACHING OF MATHEMATICS DURING THE CORONAVIRUS: WHAT HAVE WE LEARNED?

When talking to **Thomas Moore (MC)**, it doesn't take long to notice his keen passion for mathematics education. Throughout his short 10-year career, Thomas has taught in a number of schools across Melbourne, been a Leading Teacher and a Head of Mathematics, been the founder of EngageME Mathematics, and worked within both Primary and Secondary schools as an education consultant. Most recently, Thomas has also embarked on a PhD exploring how teachers of Mathematics develop strong pedagogical relationships with their students.

During the April-June remote learning period, Thomas given taught a Year 7 and a Year 9 class. He began teaching these classes after the remote learning period had begun. This required Thomas to not only teach the content remotely, but to also go through the process of building relationships and rapport with students entirely online. It's this experience which Thomas will speak to throughout the panel discussion.

Lisa Haranas has been the College Head of Mathematics (5 to 12) at Overnewton Anglican Community College since 2018. Prior to this she led the Teaching and Learning at Overnewton's Year 9 Campus, Canowindra. During her time at Canowindra, Lisa developed a range of initiatives around the use of ICT to support student learning. In addition to teaching VCE Mathematics, as Head of Mathematics, Lisa led a team of teachers from 5 – 12 in the mapping of the Australian Curriculum to the Outcomes in the VCE Mathematics Study Design. Despite finding remote challenging on many levels, Lisa has risen to the challenge and enjoyed leading her faculty through this unique period!

Michael Schaffner is an early career teacher at Penola Catholic College in the northern suburbs of Melbourne. As a proud member of Generation Z, and in only his second year of teaching, Michael has adapted to remote teaching and learning as only a digital native could. Inspired by Angela Duckworth's findings on the power of perseverance and the work of Arne Rubenstein and the Rites of Passage Institute, Michael has spent much of his early career developing teaching strategies and various on-line tools to help students from less privileged backgrounds to not only engage with mathematics, but also develop positive lifelong learning attributes.



Nich Hildebrandt is a VCE maths teacher at Trinity Grammar, Kew. He has previously taught in the U.K. at academies in Cambridge and London. Before teaching, Nich studied law and commerce and worked in various industries including Finance and Insurance in Australian and the U.K. He is interested in evidenced based approaches to maths teaching and how explicit instruction can be complemented by technology.

This keynote panel is supported by

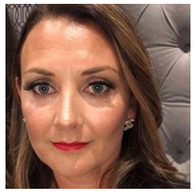
jacaranda
A Wiley Brand

PANEL: PRIMARY

WAYS TO ORGANISE YOUR CLASSROOM TO CATER FOR ALL STUDENTS IN MATHEMATICS LESSONS

Kate Copping (MC) began her career as a primary school teacher and has taught at levels from F -6, in schools in Victoria, NSW and USA. Kate has been a mathematics leader and leading teacher, and an Innovations and Excellence Cluster leader. Kate has provided mathematics professional development for teachers through ACER, the Department of Education and Training and the Bastow Institute. She has worked within schools as a consultant and provided professional development sessions.

Kate has working in teacher education for the Graduate School of Education at Melbourne University since 2008, as a Teaching Fellow and Clinical Specialist supporting teacher candidates whilst on placement and as a lecturer in primary mathematics. She completed her Masters in School Leadership in 2012 and is currently a PhD candidate. Her research involves leadership and teacher professional learning in mathematics. Kate joined the MAV Council in 2018.



Suada Dzaferovic has worked as a primary classroom teacher across all levels for the past 19 years, and more recently as a Mathematics Specialist at Toorak Primary School and Altona Green Primary School. Suada has developed her teaching, learning and leadership practices in the area of mathematics with support through the DET Primary Mathematical and Science Specialist Initiative and the MAV Collaborative. As a maths leader, Suada engages with teachers and develops their capacity in teaching mathematics through creating a shared vision of what students want to know, be and do as mathematicians. Suada inspires students to develop a growth mindset in mathematics and engages them with tasks that challenge thinking and allowing students to develop their own toolkits to use during problem solving.

Mark Gleeson has been involved in primary school education for 33 years. Early in his career, he developed the *Household Maths and Maths in Sport* programs that differentiated the curriculum and engaged students in mathematical practices that were part of their lives. Mark moved out of classroom teaching and into mathematics leadership 8 years ago, he spent several years developing an extension program for high achieving students, while concurrently developing teacher efficacy in differentiating for a wider range of students, eventually making extension a natural, accessible part of the curriculum at his school. He has been a member of MAV's Student Activities Committee and a regular state level judge for MAV's Maths Talent Quest, an investigation based competition in which his school had been a successful participant representing the Western region through his guidance. Mark is a lead member of a cohort of schools involved in the PASA project developed by Dr Joanne Mulligan and Dr Mike Mitchelmore.

Michele Klooger is a teaching associate within the Faculty of Education, Monash University. Over the past 28 years she has worked in a wide variety of primary school teaching and leadership roles, with a particular focus on numeracy and mathematics skills development. She works with teachers as a consultant in government and private schools and with undergraduate students to help prepare them for the teaching profession.

Peter Sullivan is an educator, consultant and author. His careers combines research into task design with the development of teacher support resources and classroom trialling. He was author of the *Shape of the Australian Mathematics Curriculum*, a paper commissioned by the National Curriculum Board to lay the foundation of the Australian curriculum. Subsequently he was appointed the lead writer for the development phases of the curriculum and has supported ongoing development of the documents, including consulting on the review conducted in 2015. He was also the author of the Australian Education Review publication *Teaching mathematics: Using research-informed strategies* that has now been downloaded over 210,000 times from the ACER website.

Peter has edited the prestigious *Journal for Mathematics Teacher Education* and the *Mathematics Education Research Journal* published by Springer.

This keynote presentation is supported by

AMT.
AUSTRALIAN MATHS TRUST

SESSION SUMMARY: THURSDAY

THURSDAY 3 DECEMBER 2020

SUB-THEMES

Engaging numeracy	Engaging teachers and leaders
Engaging society	Engaging technology
Engaging students	More than one sub-theme

YEAR LEVEL RANGE: *For actual target year levels per session see session descriptions.*

Rooms 1, 2, 6, 7	Foundation to Year 8
Rooms 3,4,8,9	Year 7 to Year 12
Rooms 5, 10	Misc levels

Time	Room 1	Room 2	Room 3	Room 4	Room 5	Room 6	Room 7	Room 8	Room 9	Room 10
9am -9.15am	Opening and welcome / Annual sponsor promotion									
9.15am-10.15am	Early years Maximising the natural curiosity of young children: leading to engagement *Paul Swan*	Primary Exploding dots: A global phenomenon (Focus on primary school mathematics) *James Tanton* VICTORIA State Government | Education and Training	Secondary Teach like a star *Adam Kruger and Scott Rumble* OXFORD UNIVERSITY PRESS AUSTRALIA & NEW ZEALAND	Secondary Online teaching of mathematics during the Coronavirus: What have we learned? *Panel: secondary* *Lisa Haranas, Michael Schaffner, NichHildebrandt, Tom Moore (MC)* jacaranda A Wiley Brand	All levels Teaching mathematics for social justice *Leicha Bragg*					
10.15am - 10.25am	Coffee break									
10.25am-11.10am	Pencil pushing: Do the interior angles of a triangle have measures summing to 180 degrees? *James Tanton*	Enhancing students' conceptual understanding of numeracy through games. *Bernadette Mercieca and Mary Potter*	Free resources for delivering excellence in financial literacy *Daman Nicholson*	Modelling with data capture *Neale Woods and Rebecca Hansen*	Contentious conversations in maths education *Tom Moore and Michaela Epstein*	Secondary teaching in a primary classroom *Paul Howard and Damian Smith*	Increasing collective efficacy: developing effective assessment tools to drive maths instruction *Jeanette Breen and Rhys Coulson*	Houston, we have a problem *Brian Lannen*	Further Maths exams: using the CAS calculator efficiently and effectively *Kevin McMenamin*	Stitching and drawing mathematics *Katherine Seaton*
11.10am-11.20pm	Coffee break									
11.20am-12.05pm	Nerding out on number talk pedagogy *Alex Box*	Multiplication masterclass *Andrew Lorimer-Derham*	2019 Math Methods Examinations *Allason McNamara and Mary Papp*	Minimum fun with calculus *Peter Fox*	What makes a mathematical task 'rich'? *Michaela Epstein*	Maths counts *Caroline Burston*	Stringing together reasoning, understanding and fluency *Sally Hughes and Rebecca Stewart*	Real trigonometry using real time real world data *Enzo Vozzo*	Desmos classroom activities: putting research into practice *Bryn Humberstone and Oliver Lovell*	Engaging and building confidence with EAL students in mainstream classrooms *Ruth Hibburt and Lynda Newell*
12.05pm-12.15pm	Coffee break									
12.15pm-1pm	More with measurement *Jennifer Bowden and Ellen Corovic*	Transforming mathematical games into investigations *James Russo and Toby Russo*	Specialist Maths examinations *Allason McNamara and Dean Lamson*	Problems worth coding *Peter Fox*	Engaging measurement – volume and capacity *Marj Horne and Rebecca Seah*	Maths Mantra - embedding community mathematical values *Andrew Kearl*	Goal setting in mathematics *Paul Staniscia*	H5P – A fantastic tool for developing online material *Neale Woods*	Dynamic and agentic collaborative teaching in mathematics *Steven Goldberg and Sara Niglia*	Problemo solving *Chris Wetherell*

SESSION SUMMARY: THURSDAY (cont.)

THURSDAY 3 DECEMBER 2020

SUB-THEMES

Engaging numeracy	Engaging teachers and leaders
Engaging society	Engaging technology
Engaging students	More than one sub-theme

YEAR LEVEL RANGE: *For actual target year levels per session see session descriptions.*

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Rooms 5, 10	Misc levels

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1pm-1.45pm	Lunch break and networking function									
1.45pm-2.30pm	Supporting algorithmic and computational thinking in Years F-8 *Max Stephens and Sabastian Sardina*	Games: engaging students, teachers and families in mathematics *Michael Minas, Rob Vingerhoets and James Russo*	Turning the corner towards more useful maths *Kaye Stacey*	Fun with drawings using TI-Nspire, footy jumpers shapes and colours *Raymond Rozen and Shane Dempsey*	DET resources to support teaching and teachers of mathematics and numeracy *Penny Addison*	Contextual problem posing: seeing the mathematics around us *Kate Eastcott*	Mathematics talks across the strands *Catherine Rodgers and Mandi Mackey*	Starting out with Casio ClassPad *Charlie Watson*	Free financial literacy education resources *Damian Nicholson*	Using construction to engage numeracy from year 5 to VCAL *Mark Collins*
2.30pm-2.40pm	Coffee break									
2.40pm-3.25pm	Productive discourse to enhance mathematical reasoning *Carmel Delahunty*	Engaging students in critical thinking *Rebecca Seah and Marj Horne*	Using M&M'S® to learn sampling proportion *Ewan Campbell*	Edrolo for engaging mathematics *Daniel Tram and Liam Ferris*	Building capacity to sustain growth in mathematics *Leanne McMahon and Anna Bock*	Getting 'hooked' into maths! *Bernard Kerrins*	Technology as a thinking tool: beyond practice and drill. *Andrea O'Connor and Amanda Cassidy*	Making numeracy skills visible *Andrea Loving and Claire Power*	Keeping girls in maths and addressing maths Anxiety *Kelly Sharp*	Importance of understanding equivalence for developing algebraic reasoning *Cathy Pearn and Max Stephens*
3.30pm-4.30pm	Happy hour virtual drinks									

THE MATHEMATICAL ASSOCIATION OF VICTORIA

SESSION SUMMARY: FRIDAY

FRIDAY 4 DECEMBER 2020

SUB-THEMES

Engaging numeracy	Engaging teachers and leaders
Engaging society	Engaging technology
Engaging students	More than one sub-theme

YEAR LEVEL RANGE: *For actual target year levels per session see session descriptions.*

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9am -9.15am	Opening and welcome / Annual sponsor promotion									
9.15am-10.15am	Early years A 2020 vision for engaging all children and families in mathematics learning *Ann Gervasoni* MATHS PATHWAY	Primary Ways to organise your classroom to cater for all students in mathematics lessons. Panel: primary *Kate Copping (MC, Suada Dzaferovic, Mark Gleeson, Michele Klooger and Peter Sullivan* AUSTRALIAN MATHS TRUST	Secondary Exploding dots: A global phenomenon (Focus on secondary school mathematics) *James Tanton* VICTORIA State Government | Education and Training	Secondary A new vision for a financially capable citizenry: The role of mathematics education. *Carly Sawatzki*	All levels 'Agents of change' - building student agency in mathematical learning *Tony Vallance*					
10.15am - 10.25am	Coffee break									
10.25am-11.10am	Numerous connexions: building students' capacity to rename numbers *Martin Holt*	Engaging all students through sequences of learning *Peter Sullivan*	Patterns: What to do if you believe in them. What to do if you don't. *James Tanton*	Conquering fraction misconceptions: data insights from teaching 7000 high school students. *Anna McGann and Malamati Papsimeon*	AI - machine learning and algorithms *Craig Bauling*	Improving students' reasoning skills in junior secondary classrooms *Bernadette Mercieca*	Using coding devices across the curriculum *Julie Kantor*	Engaging our own learning *Michael O'Connor*	Maths, magic and more *Stephen Hanlon*	Why aren't you working? *Tom Moore and Peter Breukers*
11.10am-11.20pm	Coffee break									
11.20am-12.05pm	Helping parents find the maths *Cassandra Lowry*	My top 5 engaging place value activities *Angela Rogers*	Sequences of learning designed to include all students *Peter Sullivan*	Widgets for VCE Methods, Further and Specialist exams *Sanjeev Meston*	What's missing? *Mike Clapper*	Developing student agency using maths conference journals *Jess Szalek*	Digital card game to build algebra foundation *Jiqing Sun and Echo Gu*	Effective mathematics teaching with the Cambridge textbooks *David Greenwood, Sara Wooley and Bryn Humberstone*	Mathematica in the classroom *Stephen Alderton and Rohan Barry*	Excel-ing at open ended problems *David Innes*
12.05pm-12.15pm	Coffee break									
12.15pm-1pm	What should teachers focus on in maths planning? *Aylie Davidson*	Fractions: Engaging and Extending Students Conceptual Understanding *Kate Copping, Carmel Mesiti and Cath Pearn*	Enhancing Conceptual Understanding using CAS technology in the Methods course *Sanjeev Meston*	Visualising algebra *Danijela Draskovic and Helen Haralambous*	Drawing Traditional Geometry & Number - Visual Learning *Nabeel Khan*	Storypath - agency through contextualised, integrated inquiry *Kris Westcott*	Structured hands-on activities = engagement + understanding *Judy Hartnett*	Things I wish I knew years ago *Peter Collins*	Worthwhile CAS calculator use in this year's Mathematical Methods Exam 2 *Kevin McMenamin*	Crossing the Murray *David Cleary and Ben Parker*

SESSION SUMMARY: FRIDAY (cont.)

FRIDAY 4 DECEMBER 2020

SUB-THEMES

Engaging numeracy	Engaging teachers and leaders
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1pm-1.45pm	Lunch break and networking function									
1.45pm-2.30pm	Pearson mathology F-2: Supporting you to teach your way *Antje Leigh-Lancaster and Lindy Bayles*	Geometry ain't square *Ellen Corovic and Jennifer Bowden*	Engaging and building confidence in students with learning difficulties *Samantha Horrocks and Ruth Hibburt*	Solving equations *Anthony Harradine*	The perfect maths planner: does it exist? *Nadia Abdelal*	What number am I? *Bill Healy*	Reflection - questions that cause thinking *Tim Campbell*	Consistent growth in maths and numeracy understanding between 7 to 9 *Hannah Young and Michelle Bregar*	Improving positive mindsets in maths and numeracy *Claire Power and Andrea Loving*	Challenging tasks, formative assessment: relations, functions and graphs *Ian Willson*
2.30pm-2.40pm	Coffee break									
2.40pm-3.25pm	Stringing together reasoning, understanding and fluency *Sally Hughes and Rebecca Stewart*	Networks *Doug Williams*	Online learning with high-impact strategies *Tim Carruthers and Antje Leigh-Lancaster*	Unlock student engagement through scaffolded mathematical reasoning. *Joel Townsend and Emma Dean*	Creating quality teacher videos on a low budget *Daniel O'Kane*	Engaging F - 6 learners using picture-story books *Stephen McLeod and Laura O'Meara*	Getting 'hooked' into maths *Bernard Kerrin*	Dr. StrangeCas: How I learned to love TI *Andrew Burden and Tim Sheers*	Content, proficiency, capability, efficacy, agency - why isolate when you can incorporate *Robert Proffitt-White*	The mathematics platform of the future *Craig Blake*
3.30pm-4.30pm	Happy hour virtual drinks									

SESSION DETAILS

THURSDAY
3 DECEMBER
2020

KEYNOTES: Thursday, 9.15am-10.15am

MAXIMISING THE NATURAL CURIOSITY OF YOUNG CHILDREN: LEADING TO ENGAGEMENT

Paul Swan, Author, Consultant
Early Years

When children first go to school, they are full of questions and wanting to learn. In this keynote Paul will discuss ways of maximising that natural engagement. Picking the right moment to build on that natural curiosity is key to maintaining a positive disposition toward mathematics. Paul will share some basic ideas for harnessing the natural enthusiasm for school and learning and channelling that toward the learning of mathematics. It is not enough to simply describe an activity as being 'fun', rather we require it to be engaging. While fun and engagement are not mutually exclusive fun DOES NOT equal engagement. Engagement will require stimulation, challenge, and a host of other factors. Hopefully, you will be engaged in this session!

EXPLODING DOTS: A GLOBAL PHENOMENON (FOCUS ON PRIMARY SCHOOL MATHEMATICS)

James Tanton, Author, Consultant
Primary

Two and a half years ago an ongoing global phenomenon in mathematics education and outreach commenced. Thousands of maths teachers, club organizers, outreach leaders, parents and maths enthusiasts from over 150 different countries and territories opened their classroom doors to students or sat at their kitchen tables with their children and engaged in a common, joyous piece of school-relevant mathematics. In Saudi Arabia, pony-tailed girls played with coloured magnetic discs stuck to a metal wall. In Australia, high-school students drew illustrations on white boards and students in Tanzania did the same on chalk boards. In Zimbabwe, students made hollows in the ground and excitedly pushed pebbles back and forth between the holes. And in Serbia, middle-school students played with dots in boxes on their laptops though an online app.

All was volunteer, all was grassroots, and all was propelled by our beautiful community of teachers across the globe simply wanting to share joyous, meaningful, connected, and genuine mathematics with their wonderful students. This community has reached over 6 million students solely through maths.

What kind of classroom-relevant mathematics has the power to enthral students across the entire planet, transcending language, borders, and technology?

And what flames were lit to first propel this mathematics across the globe? Allow me to introduce you to the "mind blowing" mathematics of Exploding Dots.

This keynote presentation is supported by

VICTORIA State Government | Education and Training

TEACH LIKE A STAR

Adam Kruger, Wesley College and Scott Rumble, Parkdale Secondary College
Secondary

Do you struggle to engage students in mathematics? Do your students ask, "Why do we need to learn this?" Would you like to show your students how mathematics can be relatable to the real world? Would you like hands on tasks to use with your students?

Our keynote will focus on how we build connections and understanding to improve student outcomes in both numeracy and mathematics. We will explain and demonstrate how we have developed a hands-on mathematics program based on classroom interactions and effective feedback. Our keynote will allow attendees to leave with tried and tested materials to use in their classroom.

Students learn best when they are motivated to learn by seeing the value and importance of the information presented. This workshop will allow attendees to experience and learn how to:

- Motivate students to learning
- Create an interactive atmosphere to allow for student voice
- Build connections through directed assessments
- Provide opportunities to apply knowledge to real world situations
- Use Project Based Learning
- Challenge and engage students through effective feedback strategies
- Measure the growth of learning of each individual student in your classroom using our data tool

By the end of the keynote, each attendee will walk away with engaging activities, strategies that they can use immediately in the classroom.

This keynote presentation is supported by

OXFORD UNIVERSITY PRESS AUSTRALIA & NEW ZEALAND

THE MATHEMATICAL ASSOCIATION OF VICTORIA

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

ONLINE TEACHING OF MATHEMATICS DURING THE CORONAVIRUS: WHAT HAVE WE LEARNED?

Panel: Tom Moore, EngageME Mathematics (MC), Michael Schaffner, Penola Catholic College, Lisa Haranas, Overnewton Anglican Community College and Nicholas Hildebrandt, Trinity Grammar School

Secondary

Victorian Secondary schools had to move quickly to implement online teaching of mathematics during the period of school shutdown. Our panel will explore the lessons that have been learnt, and discuss what worked well that we take forward, and where there is room for improvement.

Questions we must unpack include:

- How well were teachers able to make use of the available technology?
- How were tasks differentiated for students?
- Were there opportunities for interdisciplinary teaching, rich and challenging tasks, problem solving integrations and new pedagogies to be explored? Or was it just the textbook delivered online?
- How was technology integrated in this new environment to increase engagement, thinking and outcomes?
- What aspects of online learning did the students find supported and alternatively restricted their learning?
- Did some excel while others stumbled without the usual classroom to work in?
- What aspects of mathematics online learning would students like to retain and why?
- How have students adjusted back to face-to face mathematics learning?

The panel will provide an opportunity for several experienced practitioners to address the above questions, including assessment of online learning which presented fresh challenges to teachers and students.

This keynote presentation is supported by

jacaranda
A Wiley Brand

TEACHING MATHEMATICS FOR SOCIAL JUSTICE

Leicha Bragg, Deakin University
All Levels

In the midst of the 2020 global pandemic the importance of understanding mathematics and making critical decisions based on the individual and collective wellbeing of one's society has never been more evident. This infusion of mathematics with social justice emphasises being globally aware whilst locally contextualising critical dilemmas. Issues of global and local importance such as the COVID-19 pandemic, climate change, famine, and displacement require critical perspectives across disciplines. Transforming our future requires a deep understanding of mathematics to help students and educators understand the complexity of these social justice issues so that they can anticipate, act, and reflect.

In conjunction with colleagues at the University of British Columbia, Canada, we have been exploring teaching mathematics for social justice (TMfSJ). In this presentation, I will present engaging TMfSJ tasks for your future.

SESSION 1: Thursday, 10.25am-11.10am

PENCIL PUSHING: DO THE INTERIOR ANGLES OF A TRIANGLE HAVE MEASURES SUMMING TO 180 DEGREES?

(Engaging Numeracy, Engaging Teachers and Leaders, Engaging Technology)

James Tanton, Author, Consultant
Y1 - Y6

How do we encourage students to take ownership of their learning? How do we help students learn to process content, perhaps even question it, and to handle nuance, ambiguity, and maybe even contradiction? How is mathematics a perfect medium for doing this?

Let's examine a standard primary school mathematics topic – exploring the measures of angles in polygons – and use it as a platform for promoting powerful processing and questioning, meta-cognition, and sense-making. In this content-saturated 21st century, teaching can no longer primarily be about the transmission of content. Instead, we must use content as a vehicle for teaching thinking. So, let's have some fun doing some surprising deep thinking inspired by the seemingly straightforward!

ENHANCING STUDENTS' CONCEPTUAL UNDERSTANDING OF NUMERACY THROUGH GAMES.

(Engaging Numeracy)

Bernadette Mercieca and Mary Potter, ACU
F to Y6

The importance of engaging students in developing a conceptual understanding of number as opposed to the largely procedural approach of earlier years has been well researched. The term conceptual knowledge is described as knowledge rich in relationships that 'can be thought of as a "connected web of knowledge, a network in which the linking relationships are as prominent as the discrete pieces of information" (Österman & Kajsa Bråting, 2019, p.461). Primary students, in particular, require much experience in developing a deep understanding of number so that they can used it flexible ways and find efficient strategies for managing numerical situations. An engaging way of helping students to do this is through the use of games. Russo, Russo and Bragg (2018) out five features of educationally rich mathematical games. These five features will be used to analyse fun numeracy games as engaging hooks which are adaptable for the early to middle years' classroom.

FREE RESOURCES FOR DELIVERING EXCELLENCE IN FINANCIAL LITERACY

(Engaging Technology)

Damian Nicholson, Financial Basics Foundation
Y7 to Y10

Financial Basics Foundation provides free of charge to all Australian secondary teachers, extensive resources and services designed to support students to develop capacity to make responsible and informed financial choices.

The Victorian Mathematics Curriculum offers a significant opportunity to use financial literacy as a context for a range of mathematical operations and applications in your classroom.

This workshop will focus on exploring our newly launched financial literacy WebQuests, as well as ESSI Money, an interactive online game delivered in an innovative app-based environment. Students practice a wide range of real-life earning, saving, spending and investing transactions, and experience the financial consequences in a safe, fun and challenging way.

MODELLING WITH DATA CAPTURE

(Engaging Technology)

Neale Woods, Retired and Rebecca Hansen, Virtual School Victoria
Y9 to Y12

In this session, participants will have the opportunity to learn a variety of modelling skills using TI-Nspire data capturing tools. The main focus of the session will be on using the built-in features of TI-Nspire. The first part of the session will involve inserting images and basic modelling. The middle part will involve linking variables using data capture. The last part of the session will cover modelling options that require the use of extra equipment. The session is geared to teachers of Years 9 to 11 who are looking for ways to enhance their mathematics lessons. The material covered is suitable for both CAS and non-CAS technology.

SESSION 1: Thursday, 10.25am-11.10am (cont.)

CONTENTIOUS CONVERSATIONS IN MATHS EDUCATION

(Engaging Teachers and Leaders)

Tom Moore, EngageME Mathematics and Michaela Epstein, Maths Teacher Circles & The Maths Collective
Y5 to Y10

When it comes to teaching, 'there's more than one way to skin a cat!' Why do you teach the way you teach? Why have you adopted and sustained certain practices over time but avoided others? In this session, we'll be drawing on three hot topics in maths education that frequently generate debate. These topics will be used to help model effective ways to navigate tricky conversations in education that can crop up with colleagues. Come ready to hear some rich discussion and potentially the odd disagreement in order to delve deep into the pedagogical beliefs and practices which inform teaching.

SECONDARY TEACHING IN A PRIMARY CLASSROOM

(Engaging Students)

Paul Howard and Damian Smith, Notre Dame College
Y3 to Y8

Paul and Damian's presentation is targeted at primary teachers and junior secondary teachers. The presentation was inspired by their concern regarding the low mathematics levels that many students are coming in at yr 7 from the Primary sector. Having used NAPLAN data, PATmaths and personal experience as a guide, Paul and Damian will discuss the concepts about which Primary students show inadequate understanding when they begin the Yr 7. The presentation will focus on specific concepts that can be taught and extended in the primary classroom such as integers, estimation, ratios, equations. Paul and Damian will demonstrate where teachers can extend their current practice without 'Throwing the Baby out with the Bathwater' and tweak what they do to build a sturdy bridge for students to easily traverse so that they are more familiar and confident with the content when they walk into their firstYear 7 class and face the harsh reality of assessment and grades.

INCREASING COLLECTIVE EFFICACY: DEVELOPING EFFECTIVE ASSESSMENT TOOLS TO DRIVE MATHS INSTRUCTION

(Engaging Teachers and leaders)

Jeanette Breen and Rhys Coulson, Templestowe Heights Primary School
F to Y6

To target maths instruction, teachers need information on individual levels of progress to maximise the Zone of Proximal Development. At THPS, we believe that collaborating in assessment practise, assists teachers in this knowledge as an insight into student developmental progression. This collaborative inquiry process has enabled THPS to be recognised as an Influence School for two consecutive years, with sustained increases in teacher collective efficacy and numeracy achievement (NAPLAN). The presentation will provide a summary of how teachers at THPS:

- Develop mathematical constructs to break down the curriculum of a given maths area
- Collaborate to design pre/post assessments aligned to observable skills directly related to the construct
- Collectively analyse the data, targeting students at their point of need
- Examine pedagogy and high impact strategies in instruction of developmental concepts
- Review effectiveness of zoned targeted teaching through post assessment data and evidence of learning and growth

HOUSTON, WE HAVE A PROBLEM

(Engaging Students)

Brian Lannen, Murray Mathematics Curriculum Services
Y7 to Y10

This year marks the 50th anniversary of the Apollo 13 lunar mission. Who can remember this remarkable event from their own timeline? Who knows of it from the 1995 Tom Hanks film? We will start this session by using Ron Howard's inspiring docudrama as a springboard to consider problem-solving. We will formalize what the problem-solving process involves, with consideration of Polya's 4 Steps, and for the application phase, we will examine some engaging problems and lesson plans that are freely available to download online.

FURTHER MATHS EXAMS: USING THE CAS CALCULATOR EFFICIENTLY AND EFFECTIVELY

(Engaging Technology)

Kevin McMenamin, Mentone Grammar
Y9 to Y12

This session will look at questions from this year's Further Maths papers and discuss how useful the CAS calculator was in determining their answers. 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.

STITCHING AND DRAWING MATHEMATICS

(Engaging Society)

Katherine Seaton, La Trobe University
Y5 to Y10

Arts and crafts can be highly mathematical. While the world was shut down, numerous ideas for mathematical art projects were shared on social media. Teachers and parents embraced them as an accessible, participatory, non-screen and non-stressful way to engage students in mathematics learning. In this workshop, we will draw or stitch, and thus explore the mathematics of, a Japanese embroidery style, sashiko. (This workshop is presented by one of the organisers of Maths Craft Australia, and is a companion to a previous workshop on Knitting and Folding Mathematics.)

SESSION 2: Thursday, 11.20am-12.05pm

NERDING OUT ON NUMBER TALK PEDAGOGY

(Engaging Numeracy)

Alex Box, The Maths Collective
F to Y6

As a previously maths-anxious primary practitioner, discovering the very existence of number talks not only helped to create a joyful and inclusive routine for learners, but improved my own developing number sense and enjoyment of working with numbers.

In our busy teaching lives as primary generalists it´s all too easy to hear about a great new pedagogical approach without gaining a complete insight into its purpose or method. This session is a dedicated focus on what number talks are, how they´re an inclusive pedagogy and how number talks are a great practice to developing in working to develop better number sense, shift mindsets, perceptions and pedagogies in maths.

MULTIPLICATION MASTERCLASS

(Engaging Numeracy)

Andrew Lorimer-Derham, Think Square
Y3 to Y8

Failing to understand multiplication is a confidence killer. Students who haven't mastered multiplication will struggle with fractions, algebra, area, percentages, changing a recipe, financial problems...and on and on. It's no wonder these learners' disposition toward maths is negative. This hands-on workshop will show you a range of activities you can use to rapidly build number skills, lightning recall and most importantly, understanding. Experience multiplication from your learners' point of view and develop strategies for solving ANY multiplication problem as you are strategically put in unfamiliar situations. As a teacher there is nothing more rewarding than seeing a student's face light up when they realise they can learn maths. The goal of this session is to provide you with many of those moments.

2019 MATH METHODS EXAMINATIONS

(Engaging Teachers and leaders)

Allason McNamara, Trinity Grammar School Kew and Mary Papp,
Y11 to Y12

Mary and Allason will do a similar session to the 2020 MAV Meet the Assessors Lecture for Mathematical Methods. They will provide a full analysis of the 2019 examinations, highlighting student responses and key misunderstandings, commenting on some of the questions in relation to these. They will discuss the processes for setting and marking the 2019 examinations. There will be time for questions and discussion. Participants will be provided with a copy of fully worked MAV solutions to the VCAA exams.

MINIMUM FUN WITH CALCULUS

(Engaging Technology)

Peter Fox, Texas Instruments
Y11 to Y12

At MAV 2019 I presented Maximum Fun with Calculus. Many people asked for more. Someone dared me to do minimum fun, so here it is! More challenging questions that you can use with your students. They won't all be minimums and fun may not be the adjective your students use, but there is no limit to the wonderful problems we will explore.

WHAT MAKES A MATHEMATICAL TASK 'RICH'?

(Engaging Students)

Michaela Epstein, Maths Teacher Circles & The Maths Collective
Y3 to Y10

Some mathematical tasks are richer than others. They inspire student curiosity, provide a balance of productive struggle and success, and enable students to have ownership of their learning. These are tasks that are accessible to all students and leave them hungry for more.

What do these tasks look like? How can you easily identify what they are? And how can you run them to ensure success for your students?

This session will include a mix of theory, pedagogical considerations as well as practical strategies for getting rich tasks up and running in your classroom.

MATHS COUNTS

(Engaging Students)

Caroline Burston, Caulfield Junior College
F to Y6

My session will aim to provide teachers with strategies to engage all students with a range of open ended maths tasks with multiple entry and exit points to challenge and support all students. I will provide a range of fun activities that I have gathered over the years as a classroom teacher and Numeracy Coach, designed to inspire students and teachers. I also aim to build a positive mindset for teachers to have confidence towards teaching maths. The message I wish to convey is that maths can be fun and numbers are beautiful!

STRINGING TOGETHER REASONING, UNDERSTANDING AND FLUENCY

(Engaging Teachers and Leaders)

Sally Hughes, Monash University and Rebecca Stewart, Bialik College
F to Y6

A number string is an instructional routine that involves the teacher presenting a carefully designed sequence, or string, of related problems for students to solve mentally. Students engage in mathematical discourse as they explain their thinking, compare and explore connections between strategies, and justify their reasoning. Ultimately, the goal is for students to be flexible, strategic mathematical thinkers who have developed, rather than acquired, a range of mental strategies. Number strings are useful for student learning, but they also provide teachers with an opportunity to develop sophisticated instructional practices. In adopting this routine, teachers facilitate purposeful mathematical discourse, pose questions that elicit student reasoning and use mathematical representations to connect strategies and concepts. This workshop involves experiencing number strings as a learner, discussing mathematical ideas integral to strings and analysing string design – how you see problems being related and why they might be sequenced in a particular way.

REAL TRIGONOMETRY USING REAL TIME REAL WORLD DATA

(Engaging Technology)

Enzo Vozzo, Mentone Grammar
Y9 to Y12

Using real time data from the App "Flightradar24" to calculate and confirm that the speed and track of a flight is 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 as it has no restrictions on direction of travel or position.

DESMOS CLASSROOM ACTIVITIES: PUTTING RESEARCH INTO PRACTICE

(Engaging Technology)

Bryn Humberstone, Brighton Grammar School and Oliver Lovell, Sunshine College
Y7 to Y12

Desmos is known and loved for its excellent graphing calculator, but many teachers do not know about its potential to be used to probe student thinking through quizzing activities in the Mathematics classroom.

In this talk we will demonstrate how to create and run Desmos activities that can be used in any classroom where students have internet-enabled devices. We will share how we have used Desmos in remote learning as well as in our regular classrooms.

Within the talk we will also share some of the principles we use in creating and running activities, so that they are consistent with the relevant research on student learning. No prior experience with Desmos is required.

ENGAGING AND BUILDING CONFIDENCE WITH EAL STUDENTS IN MAINSTREAM CLASSROOMS

(Engaging Students)

Ruth Hibburt, DET and RJH Education Solutions and Lynda Newell, DET and the Geelong English Language Centre (GELC)
F to Y12

This session is a practical workshop to assist teachers to modify and scaffold learning to assist English as an Additional Language (EAL) students to access the Victorian Curriculum in Mathematics. Participants will learn how to engage EAL learners, amplify the speed of essential vocabulary comprehension, and build confidence with worded questions; working smarter not harder with the English language in Mathematics.

Ruth Hibburt and Lynda Newell will provide a rich insight into memory techniques for learning, understanding and applying academic vocabulary. Teachers will learn how to assist their students by exploring how synonyms, morphemes, and recycling language provides for comprehensible input. These tools and strategies are targeted at EAL students but also work just as effectively with low literacy students. Participants will leave with engaging strategies that they can implement immediately in the classroom.

SESSION 3: Thursday, 12.15pm-1pm

MORE WITH MEASUREMENT

(Engaging Students)

Jennifer Bowden and Ellen Corovic, Mathematical Association of Victoria
F to Y6

This session will explore the measurement curriculum and developmental sequence in a hands on practical way. Advice and support for teaching and learning will be provided along with engaging hands on activities. From length, area, perimeter, mass and capacity to angles and time, join Jen and Ellen for enjoyable and challenging maths professional learning. This session is suitable for teachers from Foundation to Year 6.

TRANSFORMING MATHEMATICAL GAMES INTO INVESTIGATIONS

(Engaging Students)

James Russo, Monash University and Toby Russo, Spenceley Street Primary School
F to Y8

Mathematical games are an effective tool for engaging students, promoting fluency, and encouraging the exploration of new concepts. However, we believe the most powerful games are those that can be transformed into rich mathematical investigations, where students can explore underlying concepts and use deep reasoning. We present three approaches for transforming a game into an investigation: investigating game scenarios; identifying and generalising mathematical patterns that emerge when playing the game; and inquiring into the structure of the game. For each of these approaches, additional follow-up investigations can be generated through modifying game mechanics; that is, 'changing the rules' of the game. In this presentation, we will share some of our favourite games and explore how these can be extended as investigations, while giving participants' time to consider possible investigations linked to a chosen game.

SPECIALIST MATHS EXAMINATIONS

(Engaging Teachers and leaders)

Allason McNamara, Trinity Grammar School, Kew and Dean Lamson, Kardinia International College
Y11 to Y12

Allason, Philip and Dean will discuss the processes for setting and marking the 2019 Specialist Maths examinations. They will provide a full analysis of the 2019 examinations highlighting student responses and key misunderstandings, commenting on some of the questions in relation to these. There will be time for questions and discussion. Participants will be provided with a copy of fully worked MAV solutions to the VCAA exams.

PROBLEMS WORTH CODING

(Engaging Technology)

Peter Fox, Texas Instruments
Y7 to Y12

The ability to Code or program is an inestimable skill. Coding promotes logic and reasoning, critical thinking and perseverance, the ability to contextualise and de-contextualise a problem. Combine these attributes with high quality mathematics based problems for students to explore and you have a formidable combination that engages and empowers students. Participants will not be writing programs to determine the area of a circle given the radius; instead, participants will be given great mathematics problems to explore and the structures and basis of the code need to enable such explorations.

ENGAGING MEASUREMENT – VOLUME AND CAPACITY

(Engaging Students)

Marj Horne and Rebecca Seah, RMIT University
Y5 to Y8

Measurement is a very practical aspect of the curriculum which also has strong connections to Number and Geometry as well as many non-mathematical areas of the curriculum. It is also an ideal vehicle for the development of Problem solving, investigations and reasoning. With activity based tasks that allow for differentiation in the classroom this session will focus on students developing reasoning in the domain of volume measurement

MATHS MANTRA - EMBEDDING COMMUNITY MATHEMATICAL VALUES

(Engaging Society)

Andrew Kearl, McKinnon Primary School
F to Y6

'They just don't have a maths brain, I never did either' a statement all too common from parents and sometimes even teachers.

This session will dive into the research around maths trauma and maths anxiety and how it can impact our communities. Hear about our journey in developing and embedding common mathematical values among our school community in an effort to get kids to start taking risks and seeing themselves as mathematicians.

With a focus on growth mindset and the power of a shared 'Maths Mantra' embedded across the school we are beginning to see just how a paradigm shift can change the way we think about and teach mathematics and in turn improve our student outcomes. Using current research learn the ways in which as a school we addressed maths anxiety within our staff and in turn empowered them to learn to love teaching maths.

GOAL SETTING IN MATHEMATICS

(Engaging Students)

Paul Staniscia, Oscar Romero Catholic Primary School
F to Y6

Goal setting in mathematics is not as simple as giving students goals, developing lessons based on these goals and then creating assessments that will identify whether or not students have met the goals. It takes careful planning by the teacher, as well as a classroom that promotes trust, collaboration and challenge. A classroom where students can be their own teachers, talk about the strategies they are using and can explain what they will do next. A classroom where students seek, respond to and aspire for challenge and feedback. Teachers need to set goals with their students, identify their strengths and challenges, look for strategies they will use when they don't know what to do and come to a shared understanding of how the students will know that they have met a goal. Goal setting in mathematics should be about building mathematical proficiency because mathematics is much more than content strands.

H5P – A FANTASTIC TOOL FOR DEVELOPING ONLINE MATERIAL

(Engaging Technology)

Neale Woods, Retired
Y7 to Y12

H5P is an easy-to-use digital platform that can be used for creating online material for students. The software allows users to create instructional material by inserting documents, videos, multiple choice and true/false questions, along with a wide assortment of other tools. During the session, participants will have the opportunity to view existing online mathematics material and learn how to create their own. Material created can be accessed from the H5P site or saved and inserted into online courses. The public source software is free with optional upgrades available. Participants can set up their own accounts and start creating material during the session.

DYNAMIC AND AGENTIC COLLABORATIVE TEACHING IN MATHEMATICS

(Engaging Students)

Steven Goldberg and Sara Niglia, Prahran High School
Y7 to Y10

We have spent the last year refining our collaborative (team) teaching practice and are ready to share our findings. Our journey has been one of experiment, failure, success and growth. It has enabled us to differentiate widely without streaming, intervene acutely without removing students from class and engage a broader range of students each lesson. We hope to offer a model and resources for collaborative (team) teaching that you can implement back at your own schools in 2021.

PROBLEMO SOLVING

(Engaging Students)

Chris Wetherill, Australian Maths Trust
Y3 to Y10

This year my age is the sum of the digits of your age, but in five years it will be the product. What's the age gap between us? Great question! But what strategies should I recommend and what hints should I give if my students are stuck? How does it relate to the curriculum and what do I do next when a student works out the answer? Does it even have anything to do with the real world?

In Term 4 this year, the Australian Maths Trust launched a new platform: Problemo (https://problemo.edu.au/). Problemo has been developed to assist teachers in the task of teaching – and promoting a love of – mathematical problem solving. With materials for Years 3-10 sourced from the Trust's wealth of world-class problems, complete with additional scaffolding, extensions, key strategies and links to the Australian Curriculum, there is something for everyone. Come along to find out more about the platform and how to unlock the potential of your students.

SESSION 4: Thursday, 1.45pm-2.30pm

SUPPORTING ALGORITHMIC AND COMPUTATIONAL THINKING IN YEARS F-8

(Engaging Technology)

Max Stephens, The University of Melbourne and Sebastian Sardina, RMIT University
F to Y8

Algorithmic and Computational thinking (AT/CT) are part of the F-8 Mathematics curriculum, feature in the Digital Technologies curriculum, and are key elements of STEM. Algorithmic thinking is a step-by-step cognitive strategy to problem-solving that is cornerstone in all coding programs today. its focus should be on developing inquiry and problem-solving approaches that support students' mathematical reasoning and broader thinking skills. Key resources and platforms will be identified, including those that teachers have used during the period of online teaching. We will look at Scratch and will explore several take-away algorithmic activities, from unplugged exercises to simple coding games (e.g. light-bot and turtle drawing) that illustrate key ideas of the F-8 mathematics curriculum.

GAMES: ENGAGING STUDENTS, TEACHERS AND FAMILIES IN MATHEMATICS

(Engaging Students)

Michael Minas, Love Maths and Rob Vingerhoets,
F to Y8

Games are a popular feature of many maths classrooms, in part because of their capacity to engage students and teachers alike. However, not all games are equally valuable. This workshop will discuss the five principles of educationally-rich mathematics games to support teachers to decide which games they should be using with students. We will explore these principles in the best way possible- by giving participants the chance to play a selection of our favourite games! You will leave this workshop with a range of new games that you can start using at your own school straight away, as well as an improved understanding of what makes a truly engaging maths game. The role that games can play in building strong school-home connections in the area of maths learning will be examined.

TURNING THE CORNER TOWARDS MORE USEFUL MATHS

(Engaging Numeracy)

Kaye Stacey, The University of Melbourne
Y9 to Y12

A rite of passage for many secondary students is learning how to cycle in traffic and preparing for a driver's licence. The 'Cornering' unit from the reSolve 'Mathematical Modelling Special Topic' builds understanding of road safety for drivers, cyclists and even pedestrians waiting at corners, by examining how and why long vehicles 'cut the corner'. The unit illustrates the important mathematical modelling principle of starting simply and gradually building a better model: students start from simple paper scale models, build understanding with bicycle experiments and then investigate more precisely with supplied dynamic geometry files for two and four wheeled vehicles. Finally students prepare a short road safety message or a report on an aspect of road design (such as width of parking bays). The free reSolve website provides detailed lesson plans and software for this and four other mathematical modelling units for Years 9 – 11.

FUN WITH DRAWINGS USING TI-NSPIRE, FOOTY JUMPERS SHAPES AND COLOURS

(Engaging Technology)

Raymond Rozen, RMIT University and Shane Dempsey, Hamilton College
Y9 to Y12

The latest version of TI-Nspire has intrinsic functions to draw and fill shapes. In this hands- on session we will use TI-Nspire to write programs to draw and colour some of the AFL footy teams jumpers. Come along to this colourful activity and use coordinate geometry and learn STEM concepts and programming skills. Please have a TI-Nspire CX II CAS calculator, or your laptop with TI-Npsire V5.1.

DET RESOURCES TO SUPPORT TEACHING AND TEACHERS OF MATHEMATICS AND NUMERACY

(Engaging Teachers and Leaders)

Penny Addison, Department of Education (DET) STEM Unit
F to Y12

This presentation will provide a comprehensive outline of the resources that are available on the Numeracy Portal and the Mathematics Teaching Toolkit on the DET website. It will include an overview of the various teaching and learning resources, including:

- the Mathematics Curriculum Companion
- Aboriginal perspectives in mathematics and numeracy education
- activities to support the incorporation of the Proficiencies

It will also provide an overview of the many resources that schools can use for teacher learning and development including:

- the Monographs - a series of provocations that address many of the challenges in the teaching of mathematics and numeracy
- the proficiencies, what are they and how can we learn more about them?
- developing productive dispositions
- Numeracy across the curriculum in secondary schools

Support for navigating the toolkit will also be provided and participants will identify key resources that they can take back to their schools and start using straight away.

CONTEXTUAL PROBLEM POSING: SEEING THE MATHEMATICS AROUND US

(Engaging Numeracy)

Kate Eastcott, Ashley Park Primary School
F to Y6

Contextual problem-posing, or the generation of problems about a meaningful or relevant context, is a powerful tool for building a more numerate society. As a practice, it has the potential to improve teachers' beliefs about mathematics as well as their mathematics self-efficacy, and to engage and inspire students, no matter their background, by drawing them into the mathematics in the world around them and allowing them to use mathematics in a meaningful way.

Teachers and leaders are invited to consider how they can incorporate contextual problem-posing in their practice to improve teacher engagement and reduce the reliance on pre-made resources. We will explore how to use contextual problem-posing to improve student engagement, particularly for those who lack confidence or have been reluctant to engage in mathematics, and we will discuss how incorporating this practice might promote greater social equity in our classrooms.

MATHEMATICS TALKS ACROSS THE STRANDS

(Engaging Students)

Catherine Epstein/Rodgers and Mandi Mackey, St Peter's
F to Y6

Number Talks provide a rich opportunity for all students to engage in the mathematics by encouraging them to think flexibly about numbers. Why not extend this flexible thinking across the strands! By providing rich prompts we can ignite the spark to encourage flexible thinking and reasoning. We will investigate some of these and discuss how to use them to encourage students to be divergent mathematical thinkers.

STARTING OUT WITH CASIO CLASSPAD

(Engaging Technology)

Charlie Watson, The Tuition Centre
Y9 to Y10

Learn how to operate the Casio ClassPad CAS graphing calculator. You'll develop general skills that will enable you to explore the many different ClassPad apps with confidence. Examples used will give participants an idea of the skill level to develop with students studying Year 11 and 12 ATAR courses.

FREE FINANCIAL LITERACY EDUCATION RESOURCES

(Engaging Students)

Damian Nicholson, Financial Basics Foundation
Y7 to Y10

Financial Basics Foundation provides free of charge to all Australian secondary teachers, extensive resources and services designed to support students to develop capacity to make responsible and informed financial choices. This workshop will focus on exploring Operation Financial Literacy (OFL), a comprehensive 12-module financial literacy education resource featuring over 600 pages of activities and solutions, as well as Financial Literacy in Practice (FLIP), a series of standalone lessons for building financial literacy in areas such as simple interest, compound interest and debt.

USING CONSTRUCTION TO ENGAGE NUMERACY FROM YEAR 5 TO VCAL

(Engaging Numeracy)

Mark Collins, North Geelong Secondary College
Y5 to Y12

This session looks at how to engage students in their numeracy development through the use of modelling real life situations via construction. It is hands-on, open-ended, encourages creativity and team work.

SESSION 5: Thursday, 2.40pm-3.25pm

PRODUCTIVE DISCOURSE TO ENHANCE MATHEMATICAL REASONING

(Engaging Students)

Carmel Delahunty
F to Y6

Since when is a noisy classroom a desired outcome? In a Mathematics classroom productive talk is the cornerstone of deep learning. Hearing lots of chatter is a sign that students are discussing their ideas, explaining their thinking, making new connections, and defending their viewpoints. The purpose of this session is to equip teachers with robust strategies to engage students in invigorating discussions to enhance mathematical reasoning. During this workshop teachers will have the opportunity to explore practices that will help lead students to deeper levels of reasoning, using both Tier 2 and Tier 3 language during 'exploratory discussion'. These interactions will also assist students to expand and clarify their own thinking, think with others, and help them to listen carefully to one another. Strategies that will be addressed will include 'Talk Moves', 'Number Talks', the use of effective questioning, and ways to embed and draw on mathematics vocabulary throughout a lesson.

ENGAGING STUDENTS IN CRITICAL THINKING

(Engaging Students)

Rebecca Seah and Marj Horne, RMIT University
Y5 to Y8

With a focus on practical tasks that have been used very effectively in middle years classrooms this session looks at activities to develop critical thinking through spatial understanding. These tasks are intended to engage the whole class in discussion and reasoning but work very effectively also in small group settings. There is a strong emphasis on self regulation and looking at the big picture.

USING M&M'S® TO LEARN SAMPLING PROPORTION

(Engaging Students)Ewan Campbell, The MacRoberston Girls' High School
Y11 to Y12

Sampling proportion has been in the VCE Maths Methods course for a few years now and the students struggle with it. This session goes through a great activity to develop and formalise the essential ideas of this concept. All you need is a spreadsheet and some M&M'S® minis.

EDROLO FOR ENGAGING MATHEMATICS

(Engaging Technology)

Daniel Tram and Liam Ferris, Edrolo
Y11 to Y12

Join us for a deep-dive into Edrolo's VCE Mathematics resources, including our General & Further Maths textbooks. This session will focus on strategies & habits that will help you and your students get the most out of Edrolo.

We will share best-practice case studies from across the state, looking at how teachers are currently using Edrolo for flipped learning, formative assessment, and SAC and exam preparation.

For our textbook users, you will have a chance to hear from other teachers about how their students are using our self-assessment tools and how the subsequent data enables them to target their teaching for the highest impact and get the best from their students.

BUILDING CAPACITY TO SUSTAIN GROWTH IN MATHEMATICS

(Engaging Teachers and Leaders)

Leanne McMahon and Anna Bock, Australian Mathematical Sciences Institute (AMSI)
F to Y12

The AMSI Schools team has delivered over 7000 hours of professional learning with 3000 teachers around Australia during the CHOOSEMATHS program between 2015 and 2020. This session will unpack the four principles that we have used to drive the program and build teacher's capacity in mathematics.

1. Data is essential element required to identify the key focus of professional learning and teacher support.
2. There must be a planned and explicit school focus on mathematics professional learning in schools.
3. The availability of skilled mathematics teaching leaders at the school level, who have the time and the skills to coach and support colleagues, is critical to sustaining any improvement in maths teaching and learning.
4. The opportunity for practicing teachers to embed what they have learned in the classroom is essential. Teacher professional learning must also be experiential to be effective.

SESSION 5: Thursday, 2.40pm-3.25pm (cont.)

GETTING 'HOOKED' INTO MATHS!

(Engaging Numeracy)

Bernard Kerrins, St Joseph's Primary School Rochester
F to Y8

Are your students engaged with learning Maths? Are YOU confident with teaching Maths? This workshop is all about igniting the passion for the teaching and learning of maths.

What are your strengths, and those of the students that we can tap into to make our lessons the ones that they look forward to?

Look at ways of creating and using 'hooks' to motivate greater participation by students AND teachers, and learning maths through rich contexts.

How can we incorporate maths across the curriculum? We will look at learning beyond the classroom.

An interactive presentation that will leave you invigorated about teaching, and leaving with a wealth of ideas about how to make your maths lessons more meaningful, relevant and enjoyable.

TECHNOLOGY AS A THINKING TOOL: BEYOND PRACTICE AND DRILL.

(Engaging Technology)

Andrea O'Connor and Amanda Cassidy, St Patrick's Primary School
F to Y6

The 'Technology as a Thinking Tool' session aims to examine the pedagogical use of technology in the primary classroom. The cognitive affordances of digital technology beyond 'practise and drill' will be explored through a variety of apps, applets and educational software which engage both students and teachers. Teachers will have an opportunity to explore meaningful, real-world mathematical problems which integrate the use of technology to enhance student understanding of mathematical concepts. The session will span across all primary levels and mathematical strands. All ideas and activities presented in the workshop will be designed to ensure easy implementation once workshop participants' return to their own classrooms.

MAKING NUMERACY SKILLS VISIBLE

(Engaging Students)

Andrea Loving and Claire Power, Surf Coast Secondary College
Y7 to Y11

The skills of numeracy are the foundations from which mathematical knowledge is built upon, but it is often lost deep within mathematical content. Many math teachers have argued the definition of numeracy, yet it is essential that teachers clearly understand the numerical skills that sit within the content they teach. During this interactive presentation we aim to fill your toolbox with fun and engaging ways to facilitate students accessibility to, and use of, essential numeracy skills in the real world.

KEEPING GIRLS IN MATHS AND ADDRESSING MATHS ANXIETY

(Engaging Students)

Kelly Sharp, Korowa Anglican Girls' School
Y7 to Y12

While widely accepted that girls are just as capable as boys at mathematics, they are more likely to experience maths anxiety. While closely linked, it is distinct from test anxiety and general anxiety. Maths anxiety is also not synonymous with a negative attitude towards maths, but again linked. Further to these ideas, maths anxiety is more closely linked to other anxieties than it is to maths ability and performance. Dowker, Sarkar and Looi (2016) summarise as such: In short, high-achieving girls underperform in maths compared to high-achieving boys largely due to differences in self-belief, self-efficacy and maths anxiety. Multiple studies have found that girls experience higher levels of maths anxiety than boys, with suggested reasons including social conformity, and stereotype.

As Head of Mathematics at Korowa Anglican girls school, I have seen this first hand. While our numbers retained in Specialist Maths was strong, I was concerned about the level of anxiety that appeared to be attributed to maths. I created ways within the curriculum to support students and attempt to alleviate such concerns.

While it is difficult to measure, those anxieties are still present, but, our numbers continuing onto high level maths (Specialist) have grown. We now have over one third of our girls studying Specialist Maths. This talk will discuss the literature around maths anxiety and how this has been applied to our processes to enable girls to thrive and proudly choose high level maths in their senior years.

IMPORTANCE OF UNDERSTANDING EQUIVALENCE FOR DEVELOPING ALGEBRAIC REASONING

(Engaging Teachers and Leaders)

Catherine Pearn and Max Stephens, The University of Melbourne
Y5 to Y10

The Victorian Curriculum draws attention to the key idea of equivalence for enabling primary and secondary students to solve number sentences and algebraic expressions involving the four operations. This presentation focuses on tasks from a paper and pencil assessment instrument used in a larger study which investigated the links between fractional competence and algebraic reasoning. The tasks were developed to encourage students to move beyond using the equals sign as meaning 'give an answer' to a relational understanding of the equals sign which focused on the equivalence of the expressions on both sides of the equals sign. While many researchers have highlighted the importance of algebraic reasoning for middle-years students some have suggested that students should develop computational procedures using the algebraic idea of equivalence to integrate their learning of whole numbers and fractions.

SESSION DETAILS

FRIDAY
4 DECEMBER 2020

KEYNOTES: Friday, 9.15am-10.15am

A 2020 VISION FOR ENGAGING ALL CHILDREN AND FAMILIES IN MATHEMATICS LEARNING

Ann Gervasoni, Monash University

Early years

What emerges when we envision mathematics engagement in primary schools through the lens of culture, curiosity, creativity, communication, critical thinking, and collaboration? This will be the focus of this keynote session for primary school leaders and teachers.

A vision for primary mathematics learning and teaching will be considered that places engaging children and their families at the centre. We will consider strategies that create opportunities for maximising mathematics engagement for diverse learners including mathematical investigations, ensuring sufficient challenge for all children to thrive mathematically

This keynote presentation is supported by

MATHS PATHWAY

WAYS TO ORGANISE YOUR CLASSROOM TO CATER FOR ALL STUDENTS IN MATHEMATICS LESSONS

Panel: Kate Copping, The University of Melbourne (MC),
Michele Klooger, Monash University,
Suada Dzaferovic, Toorak Primary School,
Peter Sullivan, Monash University and
Mark Gleeson, Lumen Christi Primary School

Primary

Many schools use ability grouping to cater for differences in student ability, others retain a mixed ability classroom, using other techniques to differentiate and support students. This panel will discuss what works, and the evidence for their viewpoints. Questions will include:

- What is the best model to cater for students of differing ability?
- What evidence exists to support these models?
- Does ability grouping work?
- Is mixed ability grouping effective?
- What differentiation techniques can be used to support students of varying ability regardless of how they are grouped?

This keynote presentation is supported by

AMT. AUSTRALIAN MATHS TRUST

EXPLODING DOTS: A GLOBAL PHENOMENON (FOCUS ON SECONDARY SCHOOL MATHEMATICS)

James Tanton, Author, Consultant

Secondary

Two and a half years ago an ongoing global phenomenon in mathematics education and outreach commenced. Thousands of maths teachers, club organizers, outreach leaders, parents and maths enthusiasts from over 150 different countries and territories opened their classroom doors to students or sat at their kitchen tables with their children and engaged in a common, joyous piece of school-relevant mathematics. In Saudi Arabia, pony-tailed girls played with coloured magnetic discs stuck to a metal wall. In Australia, high-school students drew illustrations on white boards and students in Tanzania did the same on chalk boards. In Zimbabwe, students made hollows in the ground and excitedly pushed pebbles back and forth between the holes. And in Serbia, middle-school students played with dots in boxes on their laptops though an online app.

All was volunteer, all was grassroots, and all was propelled by our beautiful community of teachers across the globe simply wanting to share joyous, meaningful, connected, and genuine mathematics with their wonderful students. This community has reached over 6 million students solely through maths.

What kind of classroom-relevant mathematics has the power to enthral students across the entire planet, transcending language, borders, and technology? And what flames were lit to first propel this mathematics across the globe?

Allow me to introduce you to the "mind blowing" mathematics of Exploding Dots.

This keynote presentation is supported by

VICTORIA State Government | Education and Training

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

A NEW VISION FOR A FINANCIALLY CAPABLE CITIZENRY: THE ROLE OF MATHEMATICS EDUCATION

Carly Sawatzki, Deakin University

Secondary

COVID-19 has totally disrupted the way we think about personal and public financial practices, with real implications for how schools prepare a financially capable citizenry.

Through her ongoing work in the field, Carly Sawatzki has found that young people's observations and experiences with money can influence the way they respond to money-related mathematics problems. The extent of financial loss and hardship being experienced by Australian families means that it is more important than ever to teach money and financial mathematics in research-informed, practical and sensitive ways.

In this keynote address, Carly will share examples of real world learning tasks that meaningfully connect the teaching of mathematics and numeracy in consumer, economic, and financial contexts. Through these tasks and the teaching strategies Carly models, you will deep dive into financial mathematics and discover new opportunities to engage students in applying mathematics to the sorts of financial problems and decisions life throws up. Carly's insights will make you laugh, cry, and want to teach financial mathematics differently.

'AGENTS OF CHANGE' - BUILDING STUDENT AGENCY IN MATHEMATICAL LEARNING

Tony Vallance, Lilydale High School

All levels

2020 has seen phenomenal change wrought upon all areas of society. In education, students have had to deal with a learning landscape that changes almost daily. Despite these issues, a rise in student agency has been a noted positive by many teachers in these challenging times. Many more students are seeing their voice, choice and agency grow as they transition between online and onsite learning. How can we enable our students to keep growing in their ability to become the true owners of their learning journey, how can we support them to become their own agents of change? This keynote presentation will explore:

- How using the design thinking model has helped me to support students to take ownership of their mathematical learning in a hands on and often team based way.
- How you can empower your students with short and long form, co-designed learning units that relate directly to student agency.
- How engaging a student's empathic response is critical as a vehicle for engagement, output and agency.

The key to it all is how you can 'let go, to let grow' as a facilitator of learning for your students.

SESSION 1: Friday, 10.25am-11.10am

NUMEROUS CONNEXIONS: BUILDING STUDENTS' CAPACITY TO RENAME NUMBERS

(Engaging Students)

Martin Holt, 200 Hours
F to Y6

This workshop is for primary teachers who are looking for an engaging and challenging resource that builds place value understanding.

Numerous Connexions took inspiration from Di Siemon who at MAVCON 2019, described a student's ability to rename numbers as "the best indicator for place value success." The resource includes sets of cards at each year level to facilitate renaming, as students think flexibly about numbers, make connections between equivalent representations and use reasoning to explain how they know.

In this workshop, we will explore some practical ways to use the cards at different year levels. We will consider important questions including: how might I encourage perseverance, collaboration and idea sharing? What does differentiation look like? Where might it fit within my current program?

ENGAGING ALL STUDENTS THROUGH SEQUENCES OF LEARNING

(Engaging Teachers and Leaders)

Peter Sullivan, Monash University
Y3 to Y6

This session will explain how thoughtfully planned sequences of learning can include and engage all students. Sequences should ideally include challenging tasks, intended to activate cognition, that are effectively differentiated with the learning consolidated by further tasks suitably varied. The intent is that consistent use of such a structure can reduce the anxiety experienced by some students as well as allow extension of students who are ready. Some examples of sequences suitable for middle and upper primary students will be presented, with key characteristics emphasised. The ways that sequences can also inform assessment of the proficiencies will also be explained.

PATTERNS: WHAT TO DO IF YOU BELIEVE IN THEM. WHAT TO DO IF YOU DON'T.

(Engaging Numeracy, Engaging Teachers and Leaders)

James Tanton, Author, Consultant
Y7 to Y12

Five, four, three, two, , ____. What number comes next? If you believe in patterns you would likely say one. But if you don't believe in patterns you might suggest the next number is thirteen, perhaps, justifying your claim with the formula $0.5n^4 - 5n^3 + 17.5n^2 - 26n + 18$. (Put in $n = 1$ and out pops 5, put in $n = 2$ and out comes 4, put in $n = 3$ out comes 3, put in n=4 out comes 2, and put in $n = 1$ and out comes 13.)

Let's have some fun using the tools of high school algebra to show our students that they have the power—and the responsibility—to think deeply about data, what they a priori should or should not believe about it before analysing the data mathematically to make claims about it. Simple ideas illustrated in this workshop prove the importance of being an independent-thinking, responsible citizen of the 21st century. (After all, after this workshop you will be able to write a formula that has correctly "predicted" the Dow Jones Index on the 1st of each month for the past twelve months. People might want to invest with you.)

CONQUERING FRACTION MISCONCEPTIONS: DATA INSIGHTS FROM TEACHING 7000 HIGH SCHOOL STUDENTS.

(Engaging Teachers and Leaders)

Anna McGann and Malamati Papasimeon, Maths Pathway
Y7 to Y10

We have spent the last year researching how to teach fractions, trialling what the research says on thousands of students and making improvements. We found there was a disconnect between how students were taught fractions in primary school and the assumptions high school teachers made about what students knew. We want to share what we found, focusing on the misconceptions that hold students back and how to overcome them. This includes specific visual models that can do a lot of the heavy lifting in building conceptual understanding. So, if you have ever been frustrated that some students just don't get fractions, no matter what you try, this is the session for you.

SESSION 1: Friday, 10.25am-11.10am (cont.)

AI - MACHINE LEARNING AND ALGORITHMS

(Engaging Students)

Craig Bauling, Wolfram Research Inc.
Y5 to Y12

For 30 years, Wolfram Research has been serving Educators and Researchers with one of the most comprehensive Statistics packages on the market. From this background Wolfram is now supporting companies around the world as they implement world leading AI strategies. From automobile vision systems, to facial recognition, to voice activated knowledge systems, to text recognition; Wolfram is the technology behind many ground breaking applications. In this talk, Craig Bauling will introduce you to the basics of AI, Machine Learning, and Algorithmics which can then be directly introduced into your classroom. Topics of this technical talk include:

- Computation using Natural English Language
- Supervised Machine Learning
- Unsupervised Machine Learning
- Reactive Learning
- Neural Networks
- Deploying a simple Machine Learning project to the WWW

The content will help attendees with no prior experience get started with the Wolfram products; product freely available to every teacher and student in Victoria. All attendees will receive an electronic copy of the examples, which can be adapted to individual courses.

IMPROVING STUDENTS' REASONING SKILLS IN JUNIOR SECONDARY CLASSROOMS

(Engaging Numeracy)

Bernadette Mercieca, ACU
Y5 to Y8

Reasoning refers to students "developing an increasingly sophisticated capacity for logical, statistical and probabilistic thinking and actions, such as conjecturing, hypothesising, analysing, proving, evaluating, explaining, inferring, justifying, refuting, abstracting and generalising." (Victorian Curriculum). This is one of the four key proficiencies in the Victorian Curriculum, but not necessarily one that students in junior secondary classes find easy or that is regularly integrated into the curriculum. The Australian Association of Mathematics Teachers suggests that reasoning should be integrated into all or most classes and that it is at the heart of all teaching and learning in Mathematics. This presentation will consider different activities that can be used on a regular basis to promote reasoning. Participants will have the opportunity to explore these activities for themselves.

USING CODING DEVICES ACROSS THE CURRICULUM

(Engaging Technology)

Julia Kantor, Seaford North Primary School
F to Y6

Coding skills are fast becoming a necessity in the modern world and luckily, most kids find coding and associated technology super engaging to work with. Those skills can be applied to enhance learning and engagement across the curriculum. This workshop will focus on how to utilise coding devices across the curriculum, particularly in literacy and numeracy development.

You should come away from this workshop with activities that you can use straight away in your maths and English rotations. These activities also have scope for use across other areas of the curriculum as they are readily adaptable. Beebots and Ozobots will be the tools we are working with primarily, however applications for use of Spheros will also be presented. If you have access to different coding devices in your school, these activities will still give you ideas for cross-curricular application.

ENGAGING OUR OWN LEARNING

(Engaging Teachers and Leaders)

Michael O'Connor, Australian Mathematical Sciences Institute (AMSI)
Y7 to Y12

When was the last time you learned something completely new? More than just a fact or a formula? How did you find the experience? One of the persistent criticisms of much teacher professional learning is that it doesn't meet the needs of teachers, either in content or in application. This session explores what it takes to make professional learning, particularly of mathematics, as effective as possible. With insights from the physicist Richard Feynman and Barbara Oakley, the author of "A Mind for Numbers" and "Learning How to Learn" participants will develop their own strategy for learning and then use it to begin learning a new topic in mathematics that is of relevance to their own teaching. The session will also introduce participants to AMSI's online interactive professional learning environment.

MATHS, MAGIC AND MORE

(Engaging Students)

Stephen Hanlon, Braemar College
Y7 to Y10

Maths, Magic and More is a semester-long Years 9 and 10 elective subject in mathematics taught at Braemar College. It has been designed with student engagement at its heart, delving into areas that are often overlooked in the core mathematics program. In this workshop, I will show you how binary numbers can be used to make some fun magic tricks and how problems involving numbers of other bases can develop into quadratic equations. All you need to bring is an open mind and a sense of adventure, and you should leave with some useful ideas and activities to try with your students.

WHY AREN'T YOU WORKING?

(Engaging Teachers and Leaders)

Tom Moore, EngageME Mathematics and Peter Breukers, Wangaratta High School
Y5 to Y10

Maybe they are!!!

Engagement is the focus of this year's conference, but just because a student hasn't completed much work, can you be sure they're not engaged? On the flipside, just because a student is completing work, can you be sure they are engaged? Join Thomas Moore (EngageME Mathematics) and Peter Breukers (Wangaratta High School) for an entertaining session which explores a theoretical model to help you identify different levels of on-task and off-task behaviour. We guarantee this presentation will be unlike any other you attend, as we bring together a fusion of fun, humour and theory to help you make sense of the types of effort your students are putting into their work.

SESSION 2: Friday, 11.20am-12.05pm

HELPING PARENTS FIND THE MATHS

(Engaging Society)
Cassandra Lowry, Australian Mathematical Sciences Institute (AMSI)
F2 to F4

The situation with COVID19 changed the way that education was delivered to students across the country. It hastened the development of many online tools and remote learning resources but also highlighted the frustration many parents and carers have towards mathematics.

The focus of the workshop is to provide schools with ideas and resources to support parents to become more informed participants within the maths learning process. It will make connections between traditional and modern teaching strategies and offer suggestions for ways to encourage more positive maths experiences outside of school.

MY TOP 5 ENGAGING PLACE VALUE ACTIVITIES

(Engaging Students)

Angela Rogers, RMIT University
Y3 to Y6

Place Value is one of the most important concepts for students to understand in Years 3-6. Yet, it can be difficult to find place value activities that engage students in deep thinking. This session presents a framework to support teachers in the planning of their instruction. The framework will allow teachers to implement a shared and consistent language across the school and guide their approach to the teaching and learning of place value.

The session will explore five research-based, authentic, creative, open-ended activities that lead students to deeply investigate the concepts that underpin our place value system. Participants will be provided with hands-on, practical ideas that they will be able to immediately implement in their classroom.

SEQUENCES OF LEARNING DESIGNED TO INCLUDE ALL STUDENTS

(Engaging Teachers and leaders)

Peter Sullivan, Monash University
Y7 to Y10

This session will explain how thoughtfully planned sequences of learning can include and engage all students. Sequences should ideally include challenging tasks, intended to activate cognition, that are effectively differentiated with the learning consolidated by further tasks suitably varied. The intent is that consistent use of such a structure can reduce the anxiety experienced by some students as well as allow extension of students who are ready. Some examples of sequences suitable for junior and middle secondary students will be presented, with key characteristics emphasised. The ways that sequences can also inform assessment of the proficiencies will also be explained.

WIDGETS FOR VCE METHODS, FURTHER AND SPECIALIST EXAMS

(Engaging Technology)

Sanjeev Meston, Firbank Grammar School
Y9 to Y12

Widgets and User defined functions are extremely helpful and powerful tools for responding to technology enabled examinations. Widgets are a big time saver and are very easy to access.

Writing widgets on TI Nspire does not need any coding or programming knowledge or skills as widgets use all the built in CAS tools that teachers and students may already be using. Use of widgets adds to efficiency and performance. The participants attending this session will learn to create widgets and will also be provided with some very powerful widgets.

WHAT'S MISSING?

(Engaging Students)

Mike Clapper, Australian Mathematics Trust
Y3 to Y12

This presentation looks at mathematical ideas and ways of thinking that are missing from the Australian Curriculum in its current form, yet are important in developing creative problem solvers. It is not intended as a critique of the Australian Curriculum, but more a series of strategies for engaging students in problem solving relating to, but broadening existing curriculum content.

DEVELOPING STUDENT AGENCY USING MATHS CONFERENCE JOURNALS

(Engaging Teachers and Leaders)

Jess Szalek, Department of Education and Training
Y3 to Y8

Did you know the use of a maths conference journal is a fantastic way to support student agency in the classroom?

SESSION 2: Friday, 11.20am-12.05pm (cont.)

When students take responsibility and become drivers of their own learning they are able to be independent and self-regulating learners who can track and measure their own growth. By supporting students to set guided learning goals with their teachers and monitor their learning progress with feedback, students share and celebrate their success with themselves, their parents and teachers. In this session, we will look at how to introduce maths conference journals effectively in your class as a way to empower students and build student agency to improve overall student outcomes.

DIGITAL CARD GAME TO BUILD ALGEBRA FOUNDATION

(Engaging Technology)

Jiqing Sun, Deakin University and Echo Gu, Lauriston Girls School
Y5 to Y8

The transition from arithmetic to algebraic thinking is challenging for lower secondary students. Two notable challenges for students' algebraic thinking are the understanding of pronumerals, and results-orientated thinking from arithmetic (also known as 'computational thinking'). Many mathematics educators are contributing to exploring instructional approaches in addressing these issues.

Nowadays, digital gaming has played a prominent role in mathematics teaching and learning, to engage students in developing conceptual understanding. This seminar illustrates how an online card game-based activity supports students' understanding of pronumerals, and the departure from computational thinking in an everyday classroom context. The activity is intended to be implemented at junior levels but the mathematical thinking can be incorporated into learning at senior years.

EFFECTIVE MATHEMATICS TEACHING WITH THE CAMBRIDGE TEXTBOOKS

(Engaging Students)

David Greenwood, Trinity Grammar School, Sara Woolley, St Leonard's College and Bryn Humberstone, Brighton Grammar School
Y7 to Y10

Many teachers have been told at some point that teaching using a textbook is unprofessional, because it results in limiting creativity, variety and engagement. But the alternative approaches of creating one-off activities, rich learning tasks and worksheets for an entire curriculum seem overwhelming and inefficient.

Alternatively, entrusting educational decisions to a computer algorithm reduces an expert teacher's ability to lead the learning within the classroom.

We are three authors of the Cambridge Mathematics textbook series who have spent the last decade creating textbooks that aim for the best of both worlds: enabling high quality teaching, with the efficiency of centralised resources.

As authors, experienced teachers and heads of department we want to share what we consider the best features of the series and how we use them in our contexts. We will talk about how the books have evolved to support teachers, students and even parents in secondary mathematics education.

MATHEMATICA IN THE CLASSROOM

(Engaging Technology)

Stephen Alderton and Rohan Barry, Wodonga Senior Secondary College
Y11 to Y12

Wodonga Senior Secondary College have implemented Mathematica as the computational tool for all VCE Mathematics subjects over the last several years. The session will cover selected computations, pedagogical techniques, assessment methodologies and higher orders of thinking enabled through the technology. This session will cover aspects included in Maths Methods, Specialist Maths and Further Maths.

EXCEL-ING AT OPEN ENDED PROBLEMS

(Engaging Technology)

David Innes, Box Hill High School
Y5 to Y12

Creating open-ended assessment tasks can instantly engage students in numeracy and mathematics but can be an absolute hassle to create consistency and to mark. In this session, I will be going through how I have used Microsoft Excel as a solutions-generator for open-ended tasks both in junior and VCE mathematics.

SESSION 3: Friday, 12.15pm-1pm

WHAT SHOULD TEACHERS FOCUS ON IN MATHS PLANNING?

(Engaging Teachers and Leaders)

Aylie Davidson, Deakin University
F to Y6

Mathematics planning is messy business and it is easy to get overwhelmed when planning units of work. In this workshop Aylie will share practical approaches, including free online resources and recommended texts to make planning purposeful. We will explore a planning model and planning proforma that supports teachers to focus on what matters – the maths! We will also discuss ways you can adapt these approaches to enhance your regular planning routines.

FRACTIONS: ENGAGING AND EXTENDING STUDENTS CONCEPTUAL UNDERSTANDING

(Engaging Students)

Kate Copping, Carmel Mesiti and Cath Pearn, The University of Melbourne
Y3 to Y8

The aim of this workshop is for teachers to develop and use appropriate models for working with fractions from an early understanding of equivalence to using fractions in operations. We will begin with paper folding, fraction walls, bars and number lines to develop understanding of equivalence and fractions as numbers. These tools will then be used to demonstrate the four operations to engage and extend conceptual understanding. This is intended to move students beyond procedural and rule-based thinking and to develop a richer understanding when working with fractions. Common misconceptions will be discussed along with possible approaches to address these challenges.

ENHANCING CONCEPTUAL UNDERSTANDING USING CAS TECHNOLOGY IN THE METHODS COURSE

(Engaging Teachers and Leaders)

Sanjeev Meston, Firbank Grammar School
Y11 to Y12

This session will showcase the use of CAS technology (TI Nspire CAS CX II) to enhance student conceptual understanding and learning outcomes. For teachers the session will demonstrate the use of CAS technology as an essential and powerful teaching and learning tool for all four areas of study including SAC's. Some time will also be spent on creating widgets and the newly added Graphing and Analysis tools. Widgets on a CAS are a quick way of responding to questions in examination 2. Integration of TI Nspire CAS technology with LMS will be another key feature of this presentation.

VISUALISING ALGEBRA

(Engaging Students)

Danijela Draskovic and Helen Haralambous, The Mathematical Association of Victoria
Y7 to Y10

If we consider mathematics to be a language of its own, then the introduction of letters to a syntax that has, up until that point, been entirely dominated by numbers, can be foreign and unintelligible to learners. Algebra is formally introduced in Year 7, and with this leap from numerical to symbolic representation, a large portion of students start having great difficulty interpreting mathematics; A common finding in research is that the introduction of Algebra in early secondary school (Years 7-8) contributes to a decline in a large number of students' math results due to inabilities to interpret this new mathematical language.

Visual patterns and manipulatives are a resource that can move students from being numerical to figural generalisers as they help students make connections between figures, symbols and real-life contexts. This session will demonstrate a few such resources.

DRAWING TRADITIONAL GEOMETRY AND NUMBER - VISUAL LEARNING

(Engaging Students)

Nabeel Khan, Nabeel Khan Art
Y3 to Y12

Geometry is the basis of many disciplines; physics, chemistry, biology, astronomy, architecture, art, music... geometric forms are also the building blocks of the Periodic table.

I teach children (and teachers!) how to use a ruler and compass, to create the basic shapes of our universe. I teach not only the basic shapes, but with the older children, we make tessellating patterns inspired by Islamic art and architecture. There is great value to drawing by hand rather than a computer. Alongside the drawing we talk about where these shapes appear in nature and how they can go discover them in a garden/park, skills for the rest of their school and personal lives.

MAV MEMBERSHIP

THE MATHEMATICAL ASSOCIATION OF VICTORIA

MAV is a highly active association with over 450 individual members, and nearly 900 institutional members, including schools. This provides membership benefits to a growing network of over 13,500 mathematics educators.

MAV supports its members by working with experts including leading education academics and researchers, education consultants, exemplary classroom teachers, the Victorian Department of Education, The Victorian Curriculum and Assessment Authority (VCAA), and various education partners to provide services in the interests of members and the wider community.

MAV's core services include:

- Professional learning
- In school consulting
- Professional advice
- Annual conference
- Primary and early childhood conference
- Student activities
- Newsletters, magazine and journals
- Publications and resources through MAVshop
- Advocacy and representation

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 IN THE 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 one of our networks, or start your own with MAV support
- write for MAV journals
- join committees and working parties
- 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 3: Friday, 12.15pm-1pm (cont.)

STORYPATH - AGENCY THROUGH CONTEXTUALISED, INTEGRATED INQUIRY

(Engaging Numeracy)

Kris Westcott, Sackville Street Public School
F to Y2

Originating in Scotland in the 1960s, 'Storypath' is a pedagogy which is grounded in the belief that students learn best when they are active participants in their own learning and places students' efforts to understand at the centre of educational enterprise (Cole & Margit, 2001). By using a Storypath model, teachers weave a narrative through which students respond to 'critical incidents'. These incidents motivate students to solve contextualised problems leading to deeper understanding of new concepts. This session will follow the use of the Storypath model in kindergarten to incorporate multiple strands of mathematics as well as other key learning areas including English, science and geography and the general capabilities of Critical and Creative Thinking and Personal and Social capability.

STRUCTURED HANDS-ON ACTIVITIES = ENGAGEMENT + UNDERSTANDING

(Engaging Students)

Judy Hartnett, Learning Through Doing / Making Maths Reason-able
F to Y6

This session will demonstrate a three-part lesson structure (whole class, Hands-on, independent) that builds understanding using inquiry style questioning and hands-on resources to develop deep understand the big ideas of maths. Participants will work through all three parts of at least one lesson to experience using the resources and inform discussion about the learning potential.

THINGS I WISH I KNEW YEARS AGO

(Engaging Teachers and Leaders)

Peter Collins, Dandenong High School
Y7 to Y10

You have just got a job teaching maths – what do you do now? Things I know and use now, that I wish I knew 31 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 based on avoiding pitfalls, they are based on maximising learning success and creating the environment in which this can happen. This session is aimed at maths teachers – both inexperienced and teachers who are teaching outside their area of training. It is delivered by a very experienced teacher and presenter.

WORTHWHILE CAS CALCULATOR USE IN THIS YEAR'S MATHEMATICAL METHODS EXAM 2

(Engaging Technology)

Kevin McMenamin, Mentone Grammar
Y9 to Y12

Routine and clever use of the CAS calculator in past Methods 2 examinations has shown it to be advantageous and worth the time and effort in getting to know its workings. Generally, half of the multiple choice questions and many parts of the extended answer questions benefit from good calculator skills. This hands-on session will get you using the calculator to see just how helpful (or not) it was with this year's questions. The most efficient methods will be presented and questions where the calculator should be avoided will be pointed out. The session is suitable for TI-Nspire and ClassPad users and the Casio ClassPad will be the featured CAS.

CROSSING THE MURRAY

(Engaging Students)

David Cleary, Red Cliffs Secondary College and Ben Parker, Koorie Education Workforce, North-Western Victorian Region, Mallee Area
Y5 to Y10

This is a STEM investigation set in an indigenous context. The Traditional Owners of the Millewa-Mallee lived along the banks of what we now call the Murray River in North West Victoria. "Crossing the Murray" investigates the mathematics involved in those Traditional Owners moving people and items across the river. Questions asked include: How can we measure the river's width? Is it possible to throw a package across the river and is there any way the throwing distance can be increased? How does the river's flow affect someone crossing the river? How could the Traditional Owners have recorded information about the numbers of goods crossing the river? The presentation outlines the questions to be answered, the investigation process, how the indigenous context is incorporated into the process and how that context could be modified for different locations across Victoria.

SESSION 4: Friday, 1.45pm-2.30pm

PEARSON MATHOLOGY F-2: SUPPORTING YOU TO TEACH YOUR WAY

(Engaging Teachers and Leaders)

Antje Leigh-Lancaster and Lindy Bayles, Pearson Australia
F to Y2

This session will demonstrate how teachers of all experience levels can use Mathology to access the maths knowledge, teaching strategies and support to teach the key maths concepts, identify misconceptions/extension needs and take appropriate in-the-moment actions that allow every student to progress their maths learning.

Designed on best current pedagogy, Pearson Mathology K-2 offers a flexible resource built on a research-based learning progression that has been mapped to all Australian state curricula. It equips teachers to deliver rich, hands-on lessons, activities and formative assessment through the use of age-appropriate and maths-first Little Books, table-top games and activities.

Teacher support on planning, differentiation, extension, assessment, and next steps are all available via a digital platform where teachers can also add and integrate their own favourite activities.

GEOMETRY AIN'T SQUARE

(Engaging Students)

Ellen Corovic and Jennifer Bowden, The Mathematical Association of Victoria
F to Y6

This hands on session will guide teaches through practical and engaging tasks to develop students understanding of geometry from Foundation to Year 6. Both developmental learning sequences and the curriculum will be explored and the implications these have on our teaching and student learning. Come and explore the world beyond squares, triangles and rectangles. Be prepared to engage in tasks (preferably with a partner) and respond virtually.

ENGAGING AND BUILDING CONFIDENCE IN STUDENTS WITH LEARNING DIFFICULTIES.

(Engaging Teachers and Leaders)

Samantha Horrocks, Northern Bay College and Ruth Hibburt, North Geelong Secondary College/ Northern Bay College
Y7 to Y10

This engaging practical session will look at starting, planning and structuring lessons to engage students with a variety of learning difficulties (social and intellectual) in Mathematics; including students who are completely reluctant, anxious or disengaged.

Samantha Horrocks will share different ways of supporting students and giving them choice and voice in their maths lessons and future numeracy pathways from her vast experience as an expert leading teacher and educational leader in Australia and internationally.

Ruth Hibburt will reveal her secrets to success for improving outcomes working with students who have learning difficulties in the Middle Years Literacy and Numeracy Support (MYLNS) program and share mindset tools from her new release book "Do Make Mistakes". These strategies will be shared through a workshop style presentation which can be implemented into classrooms straight away. All participants will leave with access to a pack of example materials.

SOLVING EQUATIONS

(Engaging Students)

Anthony Harradine, Potts-Baker Institute, Prince Alfred College
Y7 to Y10

This workshop will provide a way to think about the teaching and learning of equations, that will simplify both what students see and how they approach the process.

THE PERFECT MATHS PLANNER: DOES IT EXIST?

(Engaging Teachers and Leaders)

Nadia Abdelal, eXpanding Minds Maths
F to Y10

Developing effective curriculum planning documentation can be one of the most challenging things to do successfully. In this session we will be looking at what makes an effective yearly, term and unit planner and how one can be designed for the maximum engagement and clarity. This workshop will also include examples of lesson sequences and maths activities that will enrich your planning and help in addressing all aspects of the mathematics curriculum in more impactful ways.

WHAT NUMBER AM I?

(Engaging Students)

Bill Healy, Kilbaha
F to Y8

As mathematics teachers, we know that numbers are important but not all of our students share the same enthusiasm. What could help change this around? Kilbaha has developed a challenge game called *What Number Am I?* There are 50 number problems with clues in which the students are challenged to identify the correct number. Students enter their answer after reading the clues. The challenge is to get every question correct on the first attempt. Questions are marked automatically and students can progress at their own pace with as many goes at each question as they like. Along the way, numerous mathematical concepts are introduced and individual questions could be used by teachers as lessons. The final page tells students how many questions they got correct at the first attempt. Can anyone get 50 correct at the first attempt? The programme works on any computer using the free Adobe Acrobat Reader.

REFLECTION - QUESTIONS THAT CAUSE THINKING

(Engaging Students)

Tim Campbell, Antonio Park Primary School
F to Y6

Asking questions that cause our students to think should be a priority to develop problem solving and critical reflection skills. But how can we use reflection prompts in lessons where students are working on differentiated activities? When our students, irrespective of their ability, engage in thinking and discussion around the same idea, everyone benefits. When we pose effective reflection prompts and allow students to further consider and share their own learning over time, everyone benefits.

This session will explore:

- Prioritising reflection time during your Maths lessons
- Asking questions that cause thinking
- Bringing students of all abilities into the reflection discussion

To empower our students ensure they are able to grow from the mistakes they make, effective reflection plays a key role in every mathematics lesson.

CONSISTENT GROWTH IN MATHS AND NUMERACY UNDERSTANDING BETWEEN 7 TO 9

(Engaging Teachers and leaders)

Hannah Young and Michelle Bregar, Collingwood College
Y7 to Y9

In this session, we will discuss our journey from traditional Maths not working to a fully differentiated curriculum in years 7-9. We will share our learnings, tips and tricks. This will include how we organise and create units, got teachers on board, measured improvement and incorporated the Scaffolding Numeracy in the Middle Years into our curriculum. We will give you the opportunity to work through a differentiated lesson and give you a year 9 differentiated unit of work (with lesson resources and plans). We would like to acknowledge Sunshine College in helping us to get started in our journey. We would love to hear where you are on this journey and how we can support each other.

IMPROVING POSITIVE MINDSETS IN MATHS AND NUMERACY

(Engaging Students)

Claire Power and Andrea Loving, Surf Coast Secondary College
Y7 to Y12

Mathematical dispositions have been of interest to teachers for many years. For students to develop knowledge and flexibility in their thinking, they must have the confidence to take initiative and risks in their learning. The curriculum packed classroom context often has explicit teaching strategies for math knowledge and tools, but students beliefs, attitudes and values can often be left behind. In this interactive presentation, participants will have the opportunity to explore examples of mathematical disposition teaching from a secondary education context. While reflecting on their own practices and mathematical mindset, participants will discover how teaching dispositions engages students and prepares them for maths and numeracy in the real world.

SESSION 4: Friday, 1.45pm-2.30pm (cont.)

CHALLENGING TASKS, FORMATIVE ASSESSMENT: RELATIONS, FUNCTIONS AND GRAPHS

(Engaging Teachers and Leaders)

Ian Willson
Y5 to Y12

There is a view that Formative Assessment is the best way to improve student achievement—and must be our priority. Discover some of its key tenets in this interactive workshop focused on relations, functions and graphs—a core secondary mathematics area.

These principles will be considered alongside the role of challenging mathematical tasks—used collaboratively across all student achievement levels in the same classroom.

Activities which encourage students' own thinking - aimed to reduce the dominance of standard, routine approaches - will be provided. Areas covered will include:

- what is a relation, what is a function?
- what is the domain and range of a relation?
- establishing rules for given relations
- what is a polynomial, what are some of the unique characteristics of linear, quadratic and higher degree polynomials?
- relations which are not polynomials
- the use of graphical and visualisation methods to solve equations
- the role that technology has to play

SESSION 5: Friday, 2.40pm-3.25pm

STRINGING TOGETHER REASONING, UNDERSTANDING AND FLUENCY

(Engaging Teachers and Leaders)

Sally Hughes, Monash University and Rebecca Stewart, Bialik College
F to Y6

A number string is an instructional routine that involves the teacher presenting a carefully designed sequence, or string, of related problems for students to solve mentally. Students engage in mathematical discourse as they explain their thinking, compare and explore connections between strategies, and justify their reasoning. Ultimately, the goal is for students to be flexible, strategic mathematical thinkers who have developed, rather than acquired, a range of mental strategies. Number strings are useful for student learning, but they also provide teachers with an opportunity to develop sophisticated instructional practices. In adopting this routine, teachers facilitate purposeful mathematical discourse, pose questions that elicit student reasoning and use mathematical representations to connect strategies and concepts. This workshop involves experiencing number strings as a learner, discussing mathematical ideas integral to strings and analysing string design – how you see problems being related

NETWORKS

(Engaging Students)

Doug Williams
Y4 to Y8

The starting point for a mathematician is an interesting problem. Something they don't know the answer to, but find interesting enough to explore. It doesn't matter what the problem is. It does matter that it is interesting. In the beginning this activity is a game of placing square tiles to make a pathway. The problem is, how do I win the game. Then, when I've got that figured, what happens if I ...? One of those 'what happens if...' questions leads to changing lines on the tile and from there to heaps of ways of creating tiling patterns and mathematical art.

ONLINE LEARNING WITH HIGH-IMPACT STRATEGIES

(Engaging Students)

Tim Carruthers and Antje Leigh-Lancaster, Pearson Australia
Y7 to Y10

Online teaching can't be just multiple-choice questions and solo work. Genuinely effective online activities should be structured to encourage students to work together and engage with mathematical thinking more deeply, while still allowing teachers the freedom to create and adapt their own ideas for their own students' needs.

The Verso platform supports the development of critical thinking skills by providing an environment that facilitates the use of high-impact teaching strategies via structured activities based on up-to-date research.

This session will provide a quick overview of the platform and give you the opportunity to experience first hand the level of discussion and reasoning that activities in the Verso platform foster.

UNLOCK STUDENT ENGAGEMENT THROUGH SCAFFOLDED MATHEMATICAL REASONING.

(Engaging Students)

Joel Townsend and Emma Dean, Firefly Education
Y7 to Y8

Discover a logical and engaging method for teaching students how to approach mathematical reasoning with Bit Maths – a new resource for junior secondary. Too often, students transition from primary to secondary school without having been taught how to reason mathematically – leaving them under confident and disengaged as they encounter more complex problems. When asked to complete problems or inquiries that require them to apply reasoning skills, such as "proving", "explaining", "generalising", or "justifying", they don't know what to do. In this presentation, you will learn how to scaffold a meta-cognitive approach to reasoning, that will not only help students solve complex reasoning questions and communicate their answers appropriately – but also ignite their passion for mathematics in and out of the classroom.

CREATING QUALITY TEACHER VIDEOS ON A LOW BUDGET

(Engaging Technology)

Daniel O'Kane, Mathspace
F to Y12

Sharing small, 5 minute videos with your students can be a great way to engage students outside of the traditional classroom. But what's the cheapest and easiest way to do this?

Daniel is not only a maths educator, but also a trained actor. Alongside his teaching experience, he has spent years working in front of and behind the camera. Come learn all the tips & tricks to filming and editing your own videos, using low-cost minimal equipment.

In this workshop, you'll learn:

- how to set up your own recording studio using minimal equipment
- strategies to being a "one take wonder", shooting your video in one take
- how to use software to quickly edit your video in just a few minutes

ENGAGING F - 6 LEARNERS USING PICTURE-STORY BOOKS

(Engaging Students)

Stephen McLeod and Laura O'Meara, Windsor Primary School
F to Y6

Have you ever considered using picture -story books in your mathematics lessons to provide an interesting and creative context for mathematical exploration and investigation? This session aims to develop mathematical concepts using picture-story books to engage Picture-story books provide important opportunities for students to extend their knowledge through problem-solving and mathematical investigation.

GETTING 'HOOKED' INTO MATHS!

(Engaging Numeracy)

Bernard Kerrins, St Joseph's Primary School Rochester
F to Y8

Are your students engaged with learning Maths? Are YOU confident with teaching Maths? This workshop is all about igniting the passion for the teaching and learning of maths.

What are your strengths, and those of the students that we can tap into to make our lessons the ones that they look forward to?

Look at ways of creating and using 'hooks' to motivate greater participation by students AND teachers, and learning maths through rich contexts.

How can we incorporate maths across the curriculum? We will look at learning beyond the classroom.

An interactive presentation that will leave you invigorated about teaching, and leaving with a wealth of ideas about how to make your maths lessons more meaningful, relevant and enjoyable.

DR. STRANGECAS: HOW I LEARNED TO LOVE TI

(Engaging Technology)

Andrew Burden and Tim Sheers, Albert Park College
Y9 to Y12

I found that in my time as a General Maths teacher, that I got frustrated that there were things that my calculator just wouldn't do. Two things changes and I learned to really love my CAS. The first is understanding My Widgets, then understanding User Defined Functions, but where the ah-ha moment occurred was when they started working together. This session is to get together and talk about strategies to use the CAS to it's fullest potential, how we run it in our classes, and share ideas and most importantly .tns files.

SESSION 5: Friday, 2.40pm-3.25pm (cont.)

CONTENT, PROFICIENCY, CAPABILITY, EFFICACY, AGENCY - WHY ISOLATE WHEN YOU CAN INCORPORATE

(Engaging Teachers and Leaders)

Robert Proffitt-White
Y7 to Y12

We will take a look at what teachers have said is working for them from a successful four year project to build mathematics experts across participating Qld schools. Rob will go over six high yield activities/routines that teachers and students rated as the most influential on their dispostion to give maths a go.

THE MATHEMATICS PLATFORM OF THE FUTURE

(Engaging Technology)

Craig Blake, Mathspace
Y3 to Y12

Are you planning to transition to digital resources? If you answered yes to this question then come and see Mathspace in action, the complete digital platform of the future which is the right help at the right time for your students.

This session is for anyone interested in learning how Mathspace allows you to diagnose the point of need for your students, address these learning needs using a combination of online and offline resources and then measure the growth based on the student learning.

You will walk away with:

- An understanding of the key features of Mathspace
- How our digital platform is leading the way forward
- A free trial of our digital platform for term 1, 2021

Participants need no prior experience with Mathspace.

Maths Curriculum Companion

VICTORIA State Government | Education and Training

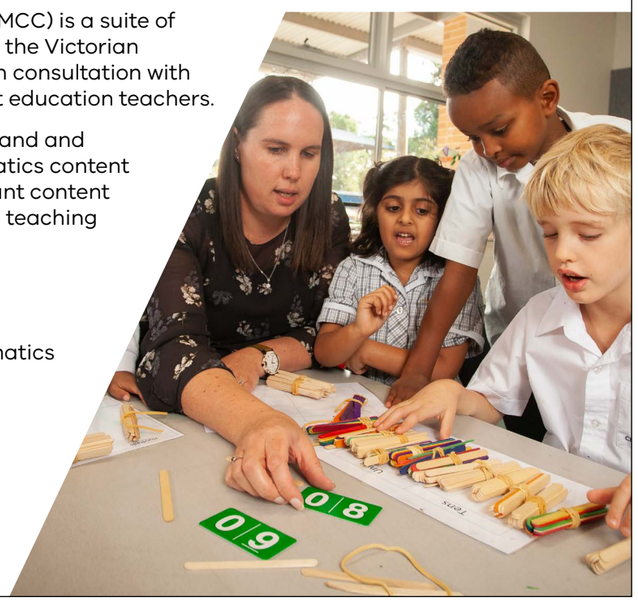
The Mathematics Curriculum Companion (MCC) is a suite of learning and teaching resources aligned to the Victorian Curriculum (F – 10). It has been developed in consultation with Victorian primary, secondary and specialist education teachers.

Resources are organised by strand, sub-strand and level. These resources unpack the mathematics content descriptions to provide teachers with relevant content knowledge, online resource and suggested teaching and learning ideas.

To explore the MCC visit:
https://fuse.education.vic.gov.au/MCC

The MCC is a key component of the Mathematics Teaching Toolkit.
www.education.vic.gov.au/mathstoolkit

MATHEMATICS TEACHING toolkit



GENERAL INFORMATION

NETWORKING LUNCH AND HAPPY HOUR

Connect, chat and laugh with your peers! Virtual Networking Lunch and Happy Hours to help you unwind.

We are excited to host virtual lunch and happy hour each day. More information can be found on the virtual platform, mav.delegateconnect.co.

GENERAL INFORMATION

Date and time
MAV20 Virtual Conference will be held on Thursday 3 December and Friday 4 December from 8.45am to 4.30pm

Registration
Registrations are now open and will close on Friday 20 November 2020. Click link to register https://register.mav.vic.edu.au/Reg

What is included
Your online conference pass will give you exclusive access to:

- All keynote speakers and sessions streamed live and on-demand
- 12 months unlimited post-Conference access to presentations, publications and resources
- All networking and happy hour events
- Interactive Q&A sessions with speakers

For information regarding the conference including presenters and exhibition contact:

Jacqui Diamond
Conference Manager
jdiamond@mav.vic.edu.au

For information regarding sponsorship contact:

Peter Saffin
Chief Executive Officer
03 9380 2399

0403 600 120
psaffin@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.

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.

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. For, program updates visit the 'program' page of the virtual platform.

SPONSOR AND EXHIBITOR ZONE

The Mathematical Association of Victoria would like to thank our sponsors and exhibitors for their continued support during these uncertain times.

Make sure you visit their profile pages on the MAV20 Conference Virtual Platform, mav.delegateconnect.co where sponsors and exhibitors are running promotions in addition to the passport competition. You can also watch promotional videos or chat or contact their team members.

SPONSORS AND EXHIBITORS

ANNUAL SPONSORS

anzuk.education

https://www.anzuk.education/

At anzuk, we understand and specialise in the service of education recruitment. We have dedicated teams delivering specific requirements across casual relief, contract placements and executive search engagements. In Melbourne, we have a team solely working with Mathematics teachers to secure contract and permanent opportunities at many of Melbourne's Independent and Catholic schools.

We value our relationships with teachers and schools and the alignment of the right teacher with the right school is always our priority.

We specialise in providing career guidance and pathways for teachers at every stage of their career journey. From graduates to principals, we assist in building your capacity through mentoring, CV building and interview coaching. We align your skills, experience and values with your next opportunity.

CAMBRIDGE UNIVERSITY PRESS

https://www.cambridge.org/

Leading the way in mathematics publishing for Australian schools, Cambridge University Press Australia is committed to the future of education in Victoria. We strive to publish exceptional resources that reflect specific syllabus requirements and broader curriculum developments, while incorporating educational change and technological innovation.

CASIO EDUCATION

www.casio.edu.shriro.com.au

For decades Casio Education Australia has been committed to supporting local Australian mathematics teachers and students. We pride ourselves on our widely available resources including hundreds of free face-to-face workshops, freely available classroom materials and lesson ideas and of course, our user friendly technology. Casio Education Technology is inspired by Australian teachers for Australian students.

TEXAS INSTRUMENTS

https://education.ti.com/en-au

For more than 30 years, TI has been an active member of classrooms around the world, empowering teachers and inspiring students to succeed in mathematics and science. Through our calculators, coaching and classroom resources, TI Education Technology is transforming the way teachers teach and students learn STEM (science, technology, engineering and mathematics) subjects. With our award-winning products, engaging lessons, real-time assessment and top-notch professional development, TI is leading the way in mathematics and science education.

SPONSORS AND EXHIBITORS (cont.)

KEYNOTE SPONSORS

AUSTRALIAN MATHS TRUST

www.amt.edu.au

The Australian Maths Trust (AMT) is a charity that helps teachers with resources and opportunities to enable their students to develop their problem-solving skills.

AMT offers annual events, like the internationally recognised Australian Mathematics Competition, and enrichment programs that run over a series of weeks or months. Other activities help build students' computational and algorithmic thinking and support STEM skill development and the maths and informatics Olympiad pathways offer students an opportunity to achieve excellence at the highest levels.

Problemo is AMT's newest online offering for teachers and is designed to transform the teaching and learning of mathematical problem solving in any classroom. It has a large bank of quality problems per year group, complete with enabling and extending prompts, sample lesson cards and worked solutions.

VICTORIA State Government | Education and Training

www.education.vic.gov.au

The Department of Education and Training works with the Victorian schooling community to give every Victorian the best learning and development experience, making our state a smarter, fairer and more prosperous place.

DET leads the delivery of education and development services to children, young people and adults both through government schools and through the regulation and funding of early childhood services, non-government schools and training programs.

Evidence-based approaches for effective numeracy and mathematics teaching from birth to Level 10, including lesson plans and videos of excellence in teaching and learning practice are collated in the Mathematics Teaching Toolkit.

jacaranda A Wiley Brand

www.jacaranda.com.au

We are passionate about Mathematics. In building the Jacaranda Maths Quest Victorian Curriculum series for Years 7-10, we have created a resource which supports teachers in ensuring that students of all abilities can achieve success – ensuring no student is left behind, and no student is held back.

In Jacaranda's VCE Maths Quest series, we aim to help prevent misconceptions, making it accessible for every student and help prepare students for exam success. Our goal is to help teachers help students at the point of learning, so every student can experience success in VCE Mathematics – in the classroom, at home and thus ultimately in the exam.

Founded in 1954, Jacaranda is the Australian School Division of Wiley, a leading global learning company. We develop and deliver inspirational digital learning solutions and education resources to secondary schools in Australia because we are deeply committed to the ideal that education brings life-changing benefits to all students. Jacaranda digital resources are designed to be intuitive and accessible to all learners and increase student engagement through high quality, media-rich content. That's why more than half of the secondary schools in Australia rely on Jacaranda digital resources and solutions to help progress their digital learning journey.

MATHS PATHWAY

https://mathspathway.com

At Maths Pathway we envision a world where every student experiences growth and success in maths. No matter their current level, or their socio-economic background. One in which all people, adult or child, are confident with numbers. This is exactly why our founders, teachers Richard and Justin, developed the Maths Pathway Learning and Teaching Model in collaboration with thousands of other teachers. The Maths Pathway model is a holistic approach that combines education best-practice with technology to entirely replace the textbooks, apps and tech systems used to teach maths in schools. The Maths Pathway model works for all students because it meets them where they happen to be in their learning journey with our students mastering twice as much of the curriculum in one year as they would in a traditional classroom.

OXFORD UNIVERSITY PRESS AUSTRALIA & NEW ZEALAND

www.oup.com.au

Since 1908, Oxford University Press Australia & New Zealand (OUPANZ) has operated as a department of the University of Oxford. Today, we are the oldest continuous educational publisher in Australia and a microcosm of OUP's worldwide organisation, with offices in more than 50 countries, publishing globally in more than 40 languages.

OUPANZ publishes learning materials for primary, secondary and higher education students plus an extensive range of dictionaries for Australia, New Zealand and Papua New Guinea.

At OUP, we believe in the power of the written word and the scholarship that stands behind it. Our mission is to create world-class print and digital educational resources and to make them available as widely as possible, furthering the University's objectives of excellence in scholarship, research and education. We believe that education changes lives, and the right learning resources can make a positive difference for learners of all ages.

EXHIBITORS

bankfirst invested in you

www.bankfirst.com.au

At Bank First, we're invested in you. We proudly support the education community, and as a bank that's owned by our customers, our profits go straight to you - providing better rates, competitive products and outstanding service.

class mathematics

https://classmathematics.com.au

FREE topic and sub-topic diagnostic quizzes: Year 7 -> Y12 Specialist (and everything in between). No Marking Required – simply scan and upload and we mark and analyse for you.

Our free plan lets you get started straight away with over 3000 resources - but you may wish to upgrade to our pro plan ($25) which will give you: fully worked solutions, extended response questions and much more.

doodlemaths

www.doodlemaths.com/for-schools

DoodleMaths is the multi-award winning programme that raises standards, builds confidence and accelerates progress in maths. Its in-built intelligence adapts to create personalised work programmes based on individual strengths and weaknesses. The Teacher Dashboard allows teachers to view each child's progress and gaps across the Australian curriculum. DoodleMaths has fun, interactive and engaging content for ages 5-15 that can be accessed on any touch-screen device or computer.

SPONSORS AND EXHIBITORS (cont.)

EXHIBITORS

Edrolo

http://edrolo.com.au

More than 800 Australian secondary schools trust Edrolo as a core resource for everyday teaching and learning. We combine a systematic, innovative, and research-led approach to resource design with actionable analytics – giving school leaders, teachers, and students the tools they need to reach their goals.

EquatIO

www.texthelp.com/en-au/products/equatio

Meet EquatIO! Taking the pain out of creating mathematical equations, formulas, graphs and maths quizzes directly on your computer for use in Microsoft Word or G Suite for Education apps. No need to use complex equation editors any more. By removing barriers to creating digital maths, both for teachers creating maths teaching and assessment materials and for students responding and showing detailed working and understanding, EquatIO truly transforms the maths classroom from "pen and paper required" to a fully digital environment. Even more critical now when supporting the remote and blended mathematics teaching and learning modes made necessary by the impact of COVID-19 on education Australia-wide.

EssentialAssessment

Assessment and Curriculum made easy

Australian Curriculum ● NSW Syllabus ● Victorian Curriculum

www.essentialassessment.com.au

Essential Assessment provides an easy and affordable way for Victorian Primary and Secondary schools to deliver a consistent approach to Victorian Curriculum numeracy and literacy assessment and curriculum from F-10A. Essential Assessment delivers a whole school approach to summative and formative assessment and delivers an online differentiated assessment and curriculum model aligned to the Victorian Curriculum. Our online assessment platform assesses and develops student knowledge within each content description and proficiency strand while delivering a differentiated online curriculum to progress each students' understanding within each strand, sub-strand and topic of the Victorian Curriculum. Essential Assessment complements good teaching practice while providing a consistent approach to assessment, curriculum and whole school data.

Felstead Education

www.felstead.com.au

We offer something a little bit different in maths education – live performances and incursions that use the power of theatre and storytelling to entertain, engage and inspire students with the wonder of maths and numbers.

Since 1988 we have delivered our maths-themed shows to hundreds of thousands of students in over 1000 schools throughout Australia, America, Europe and Asia.

Our current shows include The Maths Show, The Primary Maths Show and The Maths and Sport Show. In 2021 we will debut the How to be Good at Maths Show, especially designed to combat maths anxiety and build positive maths mindsets in students.

We work with Primary and Secondary students and are perfect for a maths week activity. We can now deliver many of our live shows via online platforms during the COVID crisis.

If you'd like your students to see maths from a different angle, full of fun, laughter and amazement, we may be just what you're looking for! Chat with us at the conference or visit our website.

BitMaths

by firefly education

www.fireflyeducation.com.au/bitmaths

Bit Maths is a new digital resource for junior secondary mathematics. With a focus on higher-order thinking, Bit Maths combines robust pedagogy with time-saving technology.

Covering all state curricula, features include engaging teaching videos, scaffolded lessons, digital activities, automatic marking and data collation, and stacks more.

Be one of the first to use this cutting-edge resource by participating in our 2021 Pilot Program. Your school will have access to Bit Maths teaching and learning resources free of charge. Chat to us during the conference, or register your interest in Bit Maths today via our website.

Kilbaha Education

Quality educational content

www.kilbaha.com.au

Kilbaha Education delivers mathematics digital resources to schools, teachers and students throughout Australia, New Zealand, the USA and the UK. Our writers are highly qualified, experienced classroom teachers. Our mathematics resources cover the class levels from Year 3 through to Year 12. Our VCE Mathematics Trial Examinations for Further Mathematics, Mathematical Methods and Specialist Mathematics are well known and have been used by schools for decades. Many of our mathematics resources are interactive with automatic checking of student input and automatic marking and scoring of assignments. Our assessment products for Mathematics can be used to keep track of student progress in numeracy. Our interactive digital resources can be implemented simply and effectively on any computer using the free downloadable Adobe Acrobat Reader. An internet connection is not required to use our digital mathematics resources, thereby making them a practical solution for all schools. All publications from Kilbaha Education are digital and are supplied to the purchasing school in both Word and PDF formats with a school site licence to reproduce for students in both print and electronic formats.

MANIC MATH

www.manicmath.com

Manic Math is a Kahoot-style game for Number and Algebra with a mission to consolidate all primary and middle school students' number and algebra foundations. It is fun, free and easy-to-use which has attracted teachers across Australia to use it as a short, enjoyable warmup or reward activity in class. Manic Math is available on all devices and platforms. Have a chat with us on the MAV20 Virtual Conference website and we'd be happy to answer any questions or play a five minute game with you to get you setup.

mathsclub

www.learnmaths.club

MathsClub provides 1-to-1 maths intervention programs for Primary schools powered by real human Maths specialists, not computer programs!

At MathsClub students work with their own personal tutor through individual learning plans, designed for mastery learning and aligned to all state curricula. Sessions take place in a safe and secure online learning environment. Tutors support students to develop a Growth Mindset towards maths and to improve their verbal reasoning skills through engaging in meaningful mathematical dialogue.

Schools use MathsClub to support their teachers and improve student progress. Teachers select students to enrol, learning plans and time slots for sessions. They are kept up to date on student progress with regular reports.

At MathsClub, we do more than just teach maths, we develop children into confident, proactive and resilient learners, ready to take on the world!

SPONSORS AND EXHIBITORS (cont.)

EXHIBITORS

MathsCraft

Doing maths like a research mathematician

www.mathscraft.org

MathsCraft: Doing Maths Like a Research Mathematician is a program that was developed in collaboration with maths teachers and working research mathematicians. The program is designed for all students in Years 5-10, offering the chance to engage in authentic, challenging adventures that provoke curiosity, inspire creativity, and promote logical and critical thinking... all using mathematical knowledge that they are already operational with.

We offer:

- Professional development and training to enable teachers to become MathsCraft adventure guides
- The MathsCraft Curriculum to support teachers to deliver the MathsCraft approach in their classrooms, including a collection of problems and resources, along with an assessment and certification component. This is a companion curriculum to the Australian Curriculum.

MATHSPACE

www.mathspace.co

At Mathspace, we encourage learning for engagement, meaning, and personal growth. Our digital maths program combines interactive curriculum-aligned content with adaptive learning smarts to create personalised learning paths for every student. With detailed student performance data, teachers can get deeper insights into how students are learning and what they're struggling with.

mta modern teaching aids

www.teaching.com.au

Modern Teaching Aids carries the largest range of teaching resources and education supplies available in Australia for primary schools, high schools, secondary schools, childcare centres, daycare centres, preschools and OOSH. The MTA range includes robotics, digital technologies, art & craft, mathematics, literacy resources, developmental products, school consumables, STEAM, classroom stationery, science equipment, STEM, sporting gear, school furniture, books, play and educational toys.

OLM OBJECTIVE LEARNING MATERIALS™ *Innovation In Learning*

MATHOMAT®

www.mathomat.com.au

This years' conference theme, "A 2020 vision: Engaging mathematics" goes to the heart of our mission as a publisher of geometry education learning tools.

The Mathomat geometry template and related publications are designed to help with the problem that students very often do not understand either the tools they use or the underlying measurement quantities that they are asked to work with. We do this by fostering deep flexible understanding. Mathomat keeps students in touch with concrete experiences from primary years while they struggle with the more abstract ideas of secondary school.

The 2021 school year will see the release of a new generation of Mathomat learning tools, and publications, to support teacher guided geometry learning. We are proud to be able to showcase this new range here at the MAV conference, and we hope to be able to discuss them with many delegates.

Pearson

www.pearson.com.au

Pearson works with primary and secondary schools across the K-12 years, offering engaging and effective resources tailored to each syllabus. Our mathematics suite includes renowned series such as Pearson Mathematics, Signpost Mathematics, as well as brand new and exciting products for today's learners like Mathology and Pearson Diagnostic.

Pearson is the world's learning company, with expertise in educational courseware and assessment, and a range of teaching and learning services powered by technology. Our products and services are used by teachers and learners around Australia and the world every day.

We're brave, imaginative, decent and accountable. These are the core values that drive everything we do. Our mission is to help people make progress in their lives through learning – because we believe that learning opens up opportunities, creating fulfilling careers and better lives.

Playlunch

www.playlunchgames.com

We seek to ease anxiety towards maths by normalising it at home in a way that's relaxed and playful. By empowering children and engaging their families and friends, we believe we can improve the educational outcomes of millions of children worldwide and help stem the global decline in maths participation.

Playlunch is developing a game-based platform that targets the antecedents that might lead to the occurrence of maths anxiety. Our focus is on the influence of families and peer-groups: a parent's attitude towards their own ability in maths and how it can influence their children, and how children and their peer-groups respond to positive, collaborative engagement with maths outside of the classroom setting.

If we envelop families and peer groups in a positive conversation about maths, we could help prevent the onset of maths anxiety and increase the chance of a student going on to a STEM-related career later in life.

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https://studyclix.com.au

Studyclix.com.au is Victoria's newest study and teaching website and is completely FREE to use for teachers. Studyclix is available in all the main VCE subjects including Maths Methods, Specialist Maths and Further Maths. Studyclix breaks up each subject into topics and for each offers official VCAA past exam questions with exam reports, videos and notes. teachers can use Studyclix's Exam Builder tool to make custom assessments using past VCE questions and then share the exam report with your students. . Join for free at Studyclix.com.au and get your school's free teacher access code.

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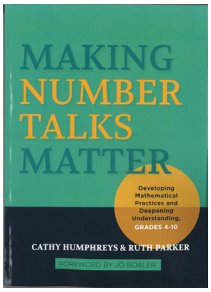


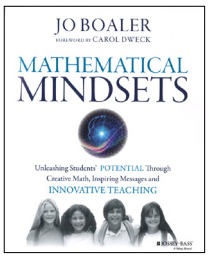
MAKING NUMBER TALKS MATTER

F–10

Making Number Talks Matter is about the myriad decisions facing teachers as they make this 15 minute daily routine a vibrant and vital part of their mathematics instruction. Practical ideas using Number Talks are shared to help students learn to reason numerically and build a solid foundation for the study of mathematics. This book will be an invaluable resource whether you are already using Number Talks or not.

If you've been looking for ways to transform your mathematics classroom – to bring sense-making and divergent thinking to the foreground, to bring mathematical practice to life, and to bring joy back into your instruction – this book is for you.

$44.90 (MEMBER)
$56.13 (NON MEMBER)



MATHEMATICAL MINDSETS

1–VCAL

This book provides practical strategies and activities to help teachers and parents show all children, even those who are convinced that they are bad at maths, that they can enjoy and succeed in maths. Jo Boaler, Stanford researcher, professor of maths education and expert on maths learning has studied why students don't like maths and often fail in maths classes. This book bridges that gap by turning research findings into practical activities and advice. Boaler translates Carol Dweck's concept of 'mindset' into maths teaching and parenting strategies, showing how students can go from self-doubt to strong self-confidence. *Mathematical Mindsets* provides a proven, practical roadmap to mathematics success for any student at any age.

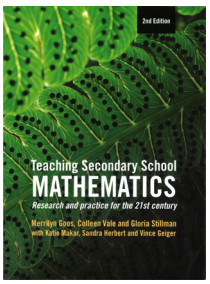
$26.34 (MEMBER)
$32.93 (NON MEMBER)

24 GAME - INTEGERS

7-10

24 Game builds strong mental mathematics and problem-solving skills, helps improve test scores and sharpens concentration.

$15 (MEMBER)
$18.75 (NON MEMBER)



TEACHING SECONDARY SCHOOL MATHEMATICS – RESEARCH AND PRACTICE FOR THE 21ST CENTURY

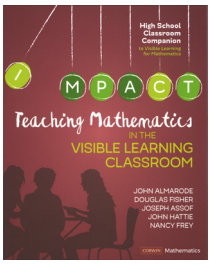
7 – VCAL

This is the second edition of a highly successful text introducing the fundamentals of teaching secondary school mathematics, fully revised to reflect the Australian Curriculum.

The mathematical proficiencies that underpin the Australian curriculum: understanding, fluency, problem solving and reasoning, are covered and a new section is devoted to numeracy. The chapter on digital tools and resources has been significantly expanded to reflect the growing use of these technologies in the classroom. Important research findings on common student misconceptions and new and effective approaches for teaching key mathematical skills are covered in detail.

Readers will find a practical guide to pedagogical approaches and the planning and enactment of lessons together with enhanced chapters on teaching effectively for diversity, managing issues of inequality and developing effective relationships with parents and the community.

$54.92 (MEMBER)
$68.65 (NON MEMBER)



TEACHING MATHEMATICS IN THE VISIBLE LEARNING CLASSROOM (HIGH SCHOOL)

6–10

How do you generate that lightbulb 'aha!' moment of understanding for your students? This book helps to answer that question by showing visible learning strategies in action in high-impact mathematics classrooms. Walk in the shoes of teachers as they engage in the countless micro-decisions required to balance strategies, tasks and assessments demonstrating that it's not only what works, but when. A decision-making matrix and grade-leveled examples help you leverage the most effective teaching practices at the most effective time to meet the learning needs of every student.

$45.08 (MEMBER)
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THE MATHEMATICAL ASSOCIATION OF VICTORIA

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