THE MATHEMATICAL
ASSOCIATION OF VICTORIA

MAV Horsham conference F-12

BUILDING ARTICULATE MATHEMATICAL THINKERS WITH THE PROFICIENCIES

Date: Friday 23 July 2021, 8.30 - 3.45pm

Venue: Horsham West Primary School

Session	Presenter	Title	Level
Registration: 8.30am-9am			
Session 1 9am–10am	Sharyn Livy	A1: Types of tasks and pedagogical approaches that promote mathematical thinking and the proficiency strands.	F-12
Session 2 10.05am–11am	Ellen Corovic	B1: Creating engaging enabling and extending prompts	F-2
	Ashlie Hassall	B2: Picture this: engaging learning with literature	F-6
	Janine Sprakel	B3: What's the problem with mathematical problem solving?	4-9
	Thomas Moore	B4: Pedagogical dig: choosing the right model to develop understanding)	7-10
	Brian Lannen	B5: Creating notes pages to store as widgets for VCE exams	VCE
Morning tea and networking: 11am–11.30am			
Session 3 11.30am–12.25pm	Ashlie Hassall	C1: Picture this: engaging learning with literature	F-2
	Ellen Corovic	C2: Kids, they hate to estimate	F-6
	Sharyn Livy	C3: Classroom discussion that builds on student thinking	F-6
	Peter Fox	C4: Game on	7-12
	Thomas Moore	C5: Pedagogical dig: choosing the right model to develop understanding	7-12
Session 4 12.30pm–1.25pm	Sharyn Livy	D1: Reasoning is my favourite	F-6
	Ellen Corovic	D2: Kids, they hate to estimate	F-6
	Ashlie Hassall	D3: Challenging learners with proving and writing mathematical claims	F-6
	Thomas Moore	D4: Why do we assess and how do we do it?	7-10
	Helen Haralambous	D5: Practical and open-ended investigation tasks	7-12
Lunch and networking: 1.25pm–2.15pm			
Session 5 2.15pm–3.10pm	Sharyn Livy	E1: Reasoning is my favourite	F-3
	Ashlie Hassall	E2: Challenging learners with proving and writing mathematical claims	F-6
	Ellen Corovic	E3: Creating engaging enabling and extending prompts	3-6
	Janine Sprakel	E4: What's the problem with mathematical problem solving?	4-9
	Helen Haralambous	E5: Teaching algebra through manipulatives	VCE
Closing keynote 3.15pm–3.45pm	Thomas Moore	F: Making and breaking it!	F-12

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You can book with confidence: if COVID-19 regulations should change, this conference will move to a virtual platform.

Horsham mathematics education conference 2021 - Session abstracts
Friday 23 July, 2021

Session	Title/abstract
Session 1: 9am-10am	
1A Keynote: Types of tasks and pedagogical approaches that promote mathematical thinking and the proficiency strands. F - 12	The purpose of this keynote presentation is to explore the types of tasks and pedagogical approaches that promote mathematical thinking and the proficiency strands in primary and secondary school classrooms. We will consider a model for student-centred inquiry learning experiences that support students to justify their strategies and strengthen understanding, fluency, problem solving and reasoning skills.
Session 2: 10.05am-11am	
B1 Creating engaging enabling and extending prompts F - 2	How do we cater for the wide range of learners in our class and ensure all students feel included in the tasks we are teaching? In this workshop teachers will explore effective tips for writing enabling and extending prompts to meet the learning needs of all students. Some guiding principles will also be shared. This will be a practical session with lots of opportunities to have a go at samples, analysing them as we go as well as an opportunity to have a go and get some feedback on writing your own.
B2 Picture this: Engaging learning with literature F - 6	In this workshop you will explore a range of picture books that engage students. Whilst exploring this fabulous collection of picture story books we will discuss ideas and strategies to develop mathematically rich and differentiated lessons. In addition, the power of developing 'story shells' as an additional tool to hook students in will be examined. This workshop will be hands on.
B3 What's the problem with mathematical problem solving? 4-9	The art of mathematical problem solving can be taught, and it is more than doing the worded problems in a textbook. Problem solving cultivates mathematical grit, it promotes communication and collaboration and gives purpose to mathematics. Looking at strategies that work and the role of classroom teachers, we will explore sources of good problems and discuss problem solving and problem posing with students of all ages.
B4 Pedagogical dig: choosing the right model to develop understanding 7-10	There are many ways to skin a cat! Over the past 12 months, the presenter of this workshop has spent many hours thinking deeply about how to represent different concepts using models and hands on manipulatives. Some are great at developing mathematical understanding, some are less so! In this workshop participants will explore different strategies they have seen and used for teaching various mathematical concepts. We will reflect on each model and explore the strengths and weaknesses of representing maths concepts in different ways.
B5 Creating Notes Pages to store as Widgets for VCE Exams (virtual) VCE	Do you know how to write, store and recall Widget pages? Widgets are single pages (of any type) that can be called up and inserted into any TI-Nspire™ document without needing to close that document. This is especially helpful for students in exams, but firstly they need to have an appropriate package of widgets on their handheld. The Notes application especially lends itself to this purpose, so this workshop is a double bonus of learning to use the Notes application and learning to utilise Widgets. It's also a 'make & take' workshop with the aim for participants to take away course-targeted Notes application Widgets to share with their students.
Session 3: 11.30am-12.25pm	
C1 Picture this: Engaging learning with literature F-2	In this workshop you will explore a range of picture books that engage students. Whilst exploring this fabulous collection of picture story books we will discuss ideas and strategies to develop mathematically rich and differentiated lessons. In addition, the power of developing 'story shells' as an additional tool to hook students in will be examined. This workshop will be hands on.

C2 Kids, they hate to estimate **F - 6**	Kids hate to estimate! Why do the same problem twice! Estimate is an essential skill in developing understanding in many aspects of mathematics. In this workshop we will explore a range of activities that utilize estimation in creative and critical ways, connecting estimation with various elements of the Victorian Curriculum. Estimation and approximating can be used in a variety of ways from warmups, challenging tasks to assessment. A variety of activities and resources will be provided to investigate and use to plan a sequence of learning. Your students will start to love to estimate and love the challenge of using it to become more critical and creative in their learning.
C3: Classroom Discussion that Builds on Student Thinking and different ways we can represent fractions. **4 - 7**	Teachers must notice, listen to, interpret, and make rapid diagnoses of students' understanding when teaching. They need to think on their feet and provide students with questions and discussion that guides more sophisticated understanding of the mathematics of the day. This workshop will explore mathematics' teaching practices that aim to extend classroom discussion that builds on student thinking and learning of fractions.
C4 Game On (virtual session) **7-10**	Are your students addicted to their phones, Playstation or Xbox? Dopamine, Serotonin, and Endorphins are amongst the chemical cocktail elicited through environments such as social media and gaming. Reward Prediction Error Encoding effectively heightens dopamine release increasing focus and engagement. Games in mathematics are much more than a novelty, they can be motivating, engaging and a powerful lever to help get students addicted to Mathematics. This workshop will provide participants with a handful of games that engage and challenge students, develop mathematically strategic problem solving and provide for a range of investigations. Game on!
C5 Pedagogical Dig: Choosing the right model to develop understanding **7-12**	There are many ways to skin a cat! Over the past 12 months, the presenter of this workshop has spent many hours thinking deeply about how to represent different concepts using models and hands on manipulatives. Some are great at developing mathematical understanding, some are less so! In this workshop participants will explore different strategies they have seen and used for teaching various mathematical concepts. We will reflect on each model and explore the strengths and weaknesses of representing maths concepts in different ways.
Session 4: 12.30am-1.25pm	
D1 Reasoning is my favourite **F-6**	Reasoning helps students to make sense of mathematics. When I first considered the four proficiency strands of the Australian Curriculum, I wasn't sure what to do. Now my favourite proficiency is reasoning a critical skill that enables students to make use of all other mathematical skills. In this workshop we will explore some tasks and consider how teachers can assist students to develop mathematical reasoning skills
D2 Kids, they hate to estimate **F-6**	Kids hate to estimate! Why do the same problem twice! Estimate is an essential skill in developing understanding in many aspects of mathematics. In this workshop we will explore a range of activities that utilize estimation in creative and critical ways, connecting estimation with various elements of the Victorian Curriculum. Estimation and approximating can be used in a variety of ways from warmups, challenging tasks to assessment. A variety of activities and resources will be provided to investigate and use to plan a sequence of learning. Your students will start to love to estimate and love the challenge of using it to become more critical and creative in their learning.
D3 Challenging learners with proving and writing mathematical claims **F-6**	This workshop will examine a gradual release approach where students are given mathematical claims to investigate. Once students are familiar with a mathematical claim they are challenged with being able to pose and prove their own claims to explore. We will also explore Number Talks as strategy to engage students as a community of mathematicians who justify their thinking and reason together to build up their understanding of concepts and share multiple strategies.

D4 Why do we assess and how do we do it? **7-10**	In this session, participants will explore the efficacy of a number of different assessment pieces. We will delve into the purpose behind each piece of assessment, the time it takes to conduct and mark it, how it is used, and what we can glean from it. Participants will then think critically about the assessment strategies they use at their own school, identifying strengths in current practice as well as areas for further improvement.
D5: Practical and open-ended investigation tasks **7-12**	Building activities based around the proficiencies, starting with problem solving and reasoning, can help student engagement and develop positive attitudes towards maths, and lead to better understanding and fluency. We will explore how incorporating open – ended tasks and investigations (hence the proficiencies as the foundation) as part of learning design can help differentiate and cater for all students' success.
Session 5: 2.15pm-3.10pm	
E1 Reasoning is my favourite **F-3**	Reasoning helps students to make sense of mathematics. When I first considered the four proficiency strands of the Australian Curriculum, I wasn't sure what to do. Now my favourite proficiency is reasoning a critical skill that enables students to make use of all other mathematical skills. In this workshop we will explore some tasks and consider how teachers can assist students to develop mathematical reasoning skills
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E3 Creating engaging enabling and extending prompts **3-6**	How do we cater for the wide range of learners in our class and ensure all students feel included in the tasks we are teaching? In this workshop teachers will explore effective tips for writing enabling and extending prompts to meet the learning needs of all students. Some guiding principles will also be shared. This will be a practical session with lots of opportunities to have a go at samples, analysing them as we go as well as an opportunity to have a go and get some feedback on writing your own.
E4 What's the problem with mathematical problem solving? **4-9**	The art of mathematical problem solving can be taught, and it is more than doing the worded problems in a textbook. Problem solving cultivates mathematical grit, it promotes communication and collaboration and gives purpose to mathematics. Looking at strategies that work and the role of classroom teachers, we will explore sources of good problems and discuss problem solving and problem posing with students of all ages.
E5 Teaching algebra through Manipulatives **7-10**	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. Through the use of manipulatives exploration of ways to make algebra more conceptually understandable to students will be demonstrated. Students need to be able to see the links between the context, the concrete representation, numerical data, visual depictions and symbolic/algebraic text. Without understanding how these representations relate to one another, algebra is indecipherable.
Closing keynote: 3.15pm-3.45pm	
Mathematical excitement - making and breaking it! **F-12**	Unfortunately, mathematics and excitement aren't two words which often go together in society. As math teachers, we often get excited by maths and the many joys it can bring, however, our students may not always feel the same way. In this keynote Thomas will share a number of strategies which can be used to develop mathematical excitement within your students, and approaches which may prevent it from occurring. Come prepared to have some fun and experience mathematical excitement for yourself.

Horsham mathematics education conference 2021 - Presenter biographies
Friday 23 July, 2021

Dr Sharyn Livy, Monash University
Dr Sharyn Livy is a Senior Lecturer of mathematics education in the Faculty of Education, Monash University. Her research interests are closely linked with teaching in supporting primary pre-service teachers (and teachers) to extend their knowledge for mathematics teaching, including ways to improve pre-service teachers' university experiences. Other research interests include implementation of sequences of challenging tasks; geometric reasoning; and engaging children with mathematics through picture story books. Sharyn is currently working on an Australian Research Council (ARC) Linkage project with colleagues to provide mathematics leaders and teachers with strategies and tools to improve student learning in the early years..

Ellen Corovic, Monash University
Ellen is a passionate educator who enjoys collaborating with students, teachers and schools. As a teacher, school leader and now education consultant, Ellen works to build individual and collective efficacy as well as teacher capacity in mathematics. Ellen supports school improvement through ongoing professional learning, coaching, and leading reflective conversations. Building mathematical connections, authentic learning and research informed decisions are some of her approaches. Ellen was based at The Mathematical Association of Victoria for ten years as a consultant and is now a Research and Professional Learning officer and PhD candidate at Monash University. Her current research is in sustaining student thinking in mathematics. She has also completed a Master of Instructional Leadership at The University of Melbourne. Ellen enjoys supporting teachers to find the beauty, fun and love of both mathematics, teaching and leading.

Ashlie Hassall, Derrimut Primary School
Ashlie is a dedicated, passionate teacher who has worked in the field for almost 10 years. She has worked across the full scope of the curriculum, with experience teaching years 1-6 as a classroom generalist teacher. She has a love for teaching maths and to cultivate a passion for numeracy amongst her students and be a leader to her peers. Ashlie has had the privilege to work with MAV on many projects and has relished these opportunities to bring about whole school change in the way Maths is taught in the primary school setting.

Janine Sprakel, Australian Mathematics Trust
A respected and experienced teacher, teacher educator and author of mathematics teaching and learning materials. Well known for leadership and project management skills, Janine has developed relationships with funding partners that have resulted in highly successful ongoing partnerships. In her role at the Australian Mathematics Trust, Janine works with stakeholders including school jurisdictions, government, teachers, parents and students to grow the understanding of the value of mathematical skills and dispositions.

Thomas Moore, EngageME Mathematics
When asked what he does, Thomas says he is Fun-employed. He is currently working as a tutor within the DET system, using the DET SNMY resources and research on best practice in teaching mathematics to guide his work. He is the founder of EngageME Mathematics in which he creates rich and engaging maths resources and animations for teachers and students to use in the classroom. He is an education consultant, working with schools across Victoria to enhance their pedagogical approaches in maths education, and make maths a subject which students and teachers look forwards to learning and teaching at their school. Last, but certainly not least, he is also completing his PhD in maths education, exploring how Maths teachers go about effectively building strong pedagogical relationships with their students. Thomas is passionate about teacher professional learning and he works consistently with the MAV to deliver engaging and thought provoking workshops aimed at improving teacher practice. Be sure to check out one of his sessions!

Helen Haralambous, The Mathematical Association of Victoria
Helen is a secondary Mathematics Education consultant for the Mathematical Association of Victoria. Helen has extensive teaching experience in secondary schools. This includes 32 years teaching secondary school mathematics, in 4 different schools (Boys schools, girls schools, coeducational and multi campus settings) and has held leadership positions including a mathematics faculty coordinator and year level coordinator. Leading teacher positions in Numeracy, Curriculum and Professional Development. She has worked as an education consultant at the ABS and has co-authored Year 7–10 mathematics textbooks.

Peter Fox, Texas Instruments
Peter has taught high school mathematics and physics for more than 25 years, worked in education research at the University of Melbourne and lectured at Monash University in Teacher Education. He has presented at educational conferences in Europe, China, USA, New Zealand, Singapore and of course Australia. He is passionate about the appropriate use of technology in mathematics education. Peter worked with Texas Instruments in the development of TI-Nspire and TI-Navigator and now works with Texas Instruments full time

Brian Lannen, Murray Mathematics Curriculum Services
Brian Lannen began his schooling at Horsham North Primary School at a time when Harold Holt was Prime Minister, our music charts were dominated by The Beatles and The Seekers and the world's first handheld calculator (Cal-Tech) was developed by Texas Instruments. Brian has subsequently embraced educational technology as fundamental to his teaching for over 35 years in Victoria and NSW. He has taught Physics, Maths and Science in schools, university and TAFE colleges, was a curriculum consultant in NSW and New York and has contributed to a range of text-book writing projects. He helped establish T-Cubed (Teachers Teaching with Technology) in Australia in the 1990s and is now a Senior Mentor to that association and Principal Host of the Texas Instruments Australia webinar program.