

# Horsham mathematics education conference 2019

INCORPORATING THE BIG IDEAS AND MATHEMATICAL  
PROFICIENCIES TO CHALLENGE STUDENT THINKING

## For primary and secondary teachers

- Building teachers understanding of the big ideas in mathematics
- Differentiation through challenging tasks
- Promoting mathematical thinking and reasoning

**Date:** Friday 2 August 2019, 9.30 - 3.30pm

**Venue:** Horsham West and Haven Primary School  
24 Hillary Street, Horsham

**Price:** \$125 (member), \$156 (non-member)

**Register:** [www.mav.vic.edu.au/pd](http://www.mav.vic.edu.au/pd)

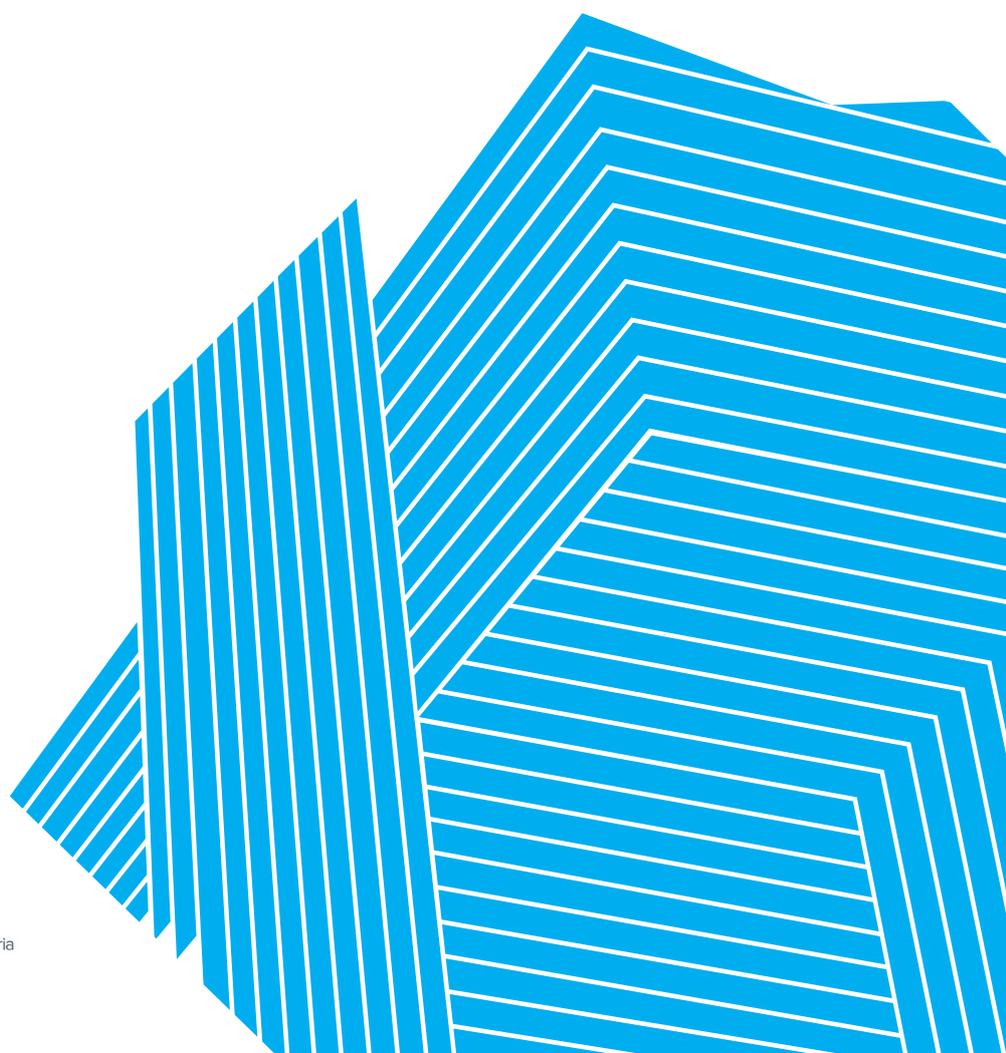
Session	Presenter	Title
Registration: 8.30am-9am		
Keynote 9am-10am	Marj Horne	A: The overarching Big Ideas – visualisation, language and representations
Session 1 10.05am-11am	Sharyn Livy	B1: Exploring effective pedagogical approaches for mathematics teaching (F - 6)
	Jen Bowden	B2: Promoting mathematical proficiencies (Y4 - 8)
	Ellen Corovic	B3: Making connections with the big ideas in mathematics (F - 6)
	Deb Carmichael	B4: Highly effective mathematics teaching (Y7 - 12)
	Marj Horne	B5: Algebraic reasoning (Y7 - 10)
Morning tea and networking: 11am-11.30am		
Session 2 11.55am-12.55pm	Sharyn Livy	C1: Exploring effective pedagogical approaches for mathematics teaching (F - 6)
	Jen Bowden	C2: The importance of play in the early years and how to capture the learning (F - 2)
	Ellen Corovic	C3: Building students' mathematical language skills (F - 6)
	Deb Carmichael	C4: Feedback in the secondary mathematics classroom (Y7 - 12)
	Marj Horne	C5: Algebraic reasoning (Y7 - 10)
Session 3 12.35pm-1.30pm	Sharyn Livy	D1: Teaching with challenging tasks: Early Years (F - 3)
	Jen Bowden	D2: Promoting mathematical proficiencies (F - 6)
	Ellen Corovic	D3: Reasoning with statistics (Y4 - 8)
	Deb Carmichael	D4: Highly effective mathematics teaching (Y7 - 12)
	Marj Horne	D5: Seeing the big picture (Y7 - 10)
Lunch and networking: 1.30pm-2.15pm		
Session 4 2.15pm-3.10pm	Sharyn Livy	E1: Teaching with challenging tasks: Early Years (F - 3)
	Jen Bowden	E2: What's the big idea in Geometry? Finding the connections (F - 6)
	Ellen Corovic	E3: Building students' mathematical language skills (F - 6)
	Deb Carmichael	E4: Feedback in the Secondary mathematics classroom (Y7 - 12)
	Marj Horne	E5: Seeing the big picture (Y7 - 10)
Conclusion keynote 3.15pm-3.45pm	Ellen Corovic and Jen Bowden	F: Breaking down the default setting (F - 12)

# Horsham mathematics education conference 2019 - Session abstracts

## Friday 2 August, 2019

Session	Title/abstract
<b>The overarching Big Ideas – visualisation, language and representations (A)</b> F - 12	These three big ideas underpin all areas of mathematics and are critical for STEM careers. Reframing Mathematical Futures II) Project, part of the Australian Mathematics and Science Partnership Program (AMSPP), has developed evidence-based learning frameworks of big ideas in the areas of Algebraic Reasoning, Geometric Reasoning and Statistical Reasoning for grades 7-10, along with related assessment and advice to teachers. Examples from the project illustrate the foundational nature of these three big ideas.
<b>Exploring effective pedagogical approaches for mathematics teaching (B1, C1)</b> F - 6	Effective teachers have high expectations of their students, use problems that have meaning and increase in sophistication so that students can make connections and build their mathematical knowledge. This workshop will provide teachers with a deeper understanding of what effective mathematics teaching practices are, how they can be implemented in the classroom and what can be gained by making them part of one's daily teaching practice.
<b>Teaching with challenging tasks: Early Years (D1, E1)</b> F - 3	This year I am working with teachers in the early years to explore how students respond and learn given a lesson structure of launch, explore and summarise and teaching sequences of challenging tasks. During this workshop, we will explore the lesson structure for teaching with challenging tasks and a sequence of learning, where each task builds on the learning of the prior task.
<b>Promoting mathematical proficiencies (B2, D2)</b> Y4 - 8 (session B3) F - 6 (session D2)	In this workshop will explore the proficiencies: problem solving, reasoning, understanding, and fluency and investigate their place in our mathematics curriculum and provide the foundation of mathematics teaching and learning activities. During the workshop participants will complete a range of mathematical tasks in utilising and interlacing each of the proficiencies.
<b>The importance of play in the early years and how to capture the learning (C2)</b> F - 3	There has been considerable quality research, development of resources and examples of practice into the use of rich tasks, challenging tasks and inquiry-based learning in primary schools. In this workshop we will investigate the research behind implementing the pedagogy in such tasks into the early years settings. We will discuss the learning opportunities of creative and critical thinking that arise and how we can utilise these experiences to enhance classroom through play-based explorations.
<b>What's the big idea in Geometry? Finding the connections (E2)</b> F - 6	It's more than space and shape! In this workshop we will look at the big ideas behind geometry and the importance of teaching concepts through connections, including algorithmic thinking. We will explore the big ideas in geometry, make links to the proficiencies and links with creative and critical thinking.
<b>Making connections with the big ideas in mathematics (B3)</b> F - 6	This workshop will focus on how 'Big Ideas' thinking connects to mathematics, curriculum and practice; from a global level down to individual school perspectives. Time will be spent unpacking what the Big Ideas are from a top down and bottom up approach and the implications this perspective has on schools, teachers and our students.
<b>Building students' mathematical language skills (C3, E3)</b> F - 6	If order for students to truly understand concepts, they need to use mathematically language fluently. This session will focus on how to build students' learning of mathematically language and the importance of doing so. Practical tools to develop students use of maths vocabulary will be shared to develop deeper understanding of mathematically concept.
<b>Reasoning with statistics (D3)</b> Y4 - 8	Statistics in primary school is more than graphing students favourite food. This session will explore how statistics can be used to generate students critical and creative thinking. In addition we will explore how statistics can be used as a driver to introduce or consolidate the big ideas in Number. This will be a hands on and active session so be prepared to think.

Session	Title/abstract
<b>Feedback in the secondary mathematics classroom (C4, E4)</b> Y7 - 12	According to John Hattie, 'The most powerful single modification that enhances achievement is feedback.' In this workshop, we will explore high impact feedback strategies, which are particularly suited to mathematics classes. There will be an opportunity to share strategies, add to your repertoire of formative assessment techniques and perform a 'health check' on the feedback friendly environment in your classroom.
<b>Highly effective mathematics teaching (B4, D4)</b> Y7 - 12	Take a curated walk through the research on what works to maximise student learning in the Mathematics classroom. We'll look at a range of characteristics of highly effective mathematics teaching before you select an area in which you would like to take a deeper dive. Finish the session with a commitment to try at least one new idea to keep improving your practice.
<b>Algebraic reasoning (B5, C5)</b> Y7 - 10	The Reframing Mathematical Futures II Project has developed a framework of big ideas in algebraic reasoning based on the evidence of what students around Australia in grades 7-10 could actually do. This framework then enables teachers to target their teaching to more effectively meet student needs. This workshop will explore the framework, looking at evidence of what students could do and some activities to enable targeted teaching to assist in the development of students' algebraic reasoning.
<b>Seeing the big picture (D5, E5)</b> Y7 - 10	Critical for STEM careers, visualisation and Geometry and Measurement are important parts of the curriculum, yet in these areas Australia is lagging behind many other countries. In this workshop participants will look at some of the evidence of what students in the middle years could demonstrate and use some of the activities developed as part of the RMFII project in the domain of Geometric Reasoning, connect those activities back to the framework of big ideas.
<b>Breaking down the default setting</b> F - 12	Teacher confidence in their abilities to make a difference has a powerful, if indirect, relationship on enhancing student learning. This keynote will explore how teacher confidence effects teaching decisions and the subsequent effects on student outcomes through unpacking the elements of primary teacher efficacy in mathematics. The session will investigate how examining default settings and reviewing automatic programming may benefit teachers and students.



# Horsham mathematics education conference 2019 - Presenter biographies

## Friday 2 August, 2019



**Dr Sharyn Livy**  
Lecturer, Early years/Primary-Numeracy  
Monash University

Dr Sharyn Livy is a lecturer of primary mathematics education at Monash University. Before joining Monash University in 2015, Sharyn was a numeracy consultant with the Mathematical Association of Victoria. She is passionate about providing pre-service teachers and teachers with innovative mathematical experiences that promote students' mathematical knowledge and teachers' pedagogical approaches. Other research interests include implementation of sequences of challenging tasks; geometric reasoning; and engaging children with mathematics through picture story books. She also regularly conducts professional learning for teachers and has delivered workshops and presentations at national and international conferences.



**Ellen Corovic**  
Mathematics Education Consultant  
The Mathematical Association of  
Victoria

Ellen Corovic is a passionate educator who enjoys collaborating with students, teachers and schools. As a teacher, school leader now Mathematics Education Consultant at MAV, Ellen works to build individual and collective efficacy as well as teacher capacity in mathematics. In her role, Ellen supports school improvement through ongoing professional learning, coaching, and leading reflective conversations. She supports school to develop clarity in their purpose by co-designing a plan for action and success.



**Deb Carmichael**  
Senior Advisor - The Development  
Centre  
Independent Schools Victoria

Deb Carmichael has taught mathematics for nearly 30 years across all secondary year levels and in a variety of contexts. She has held Head of Department roles and Senior Executive roles. Deb is now a Senior Advisor at Independent Schools Victoria, working in The Development Centre. This allows her use her experience, ideas, understanding of current research and passion for mathematics teaching to engage and work with fellow educators.



**Jen Bowden**  
Mathematics Education Consultant  
The Mathematical Association of  
Victoria

Jennifer Bowden enjoys inspiring teachers to become more critical and creative in their teaching. As an education consultant for the Mathematical Association of Victoria, she works with teachers and leaders to build teacher capacity, increase knowledge of curriculum content, develop pedagogies and establish school-wide improvement plans. Jennifer's current interest is in developing challenging tasks with teachers to ensure all students are engaged and challenged in their learning. She is interested in utilising inquiry to strengthen students' mathematical understanding and cognitive engagement.



**Marj Horne**  
Adjunct Professor  
RMIT University

Marj started her career as a secondary mathematics and science teacher in a small school in the Western District of Victoria. Currently an Adjunct Professor at RMIT University, Marj has taught mathematics in classrooms from pre-school through to University mathematics. She has most recently been part of the research team for the Reframing Mathematics Futures Project II, a national project based at RMIT seeking to support teachers to improve outcomes for students in years 7-10. Her greatest enjoyment is sharing her love of mathematics with students, teachers and parents.