2019 MAWA CONFERENCE: Primary and Secondary - Monday 18 November

Start at 8:00	**REGISTRATIONS - Convention Centre Foyer**						
	Crown Ballroom 2				Crown Ballroom 3A & 3B		
8:45 - 9:00	Secondary Opening Ceremony: Wendy Pero - MAWA Conference Convenor Welcome: Paula McMahon - MAWA Executive Officer				Primary Opening Ceremony: Lesley Stoffels - MAWA Conference Convenor Welcome: John West - President of MAWA		
	Crown Ballroom 2				Crown Ballroom 3A & 3B		
9:00 - 10:15	SECONDARY KEYNOTE: Eddie Woo - Motivated reasoning				PRIMARY KEYNOTE: Penny Crossland - Critical and creative thinking in the primary mathematics classroom		
10:15 - 10:50	**MORNING TEA - EXHIBITION HALL (Astral)**						
	Crown Ballroom 3A	Crown Ballroom 3B	Crown Ballroom 3C	Meeting Room 1	Meeting Room 2	Meeting Room 3	Meeting Room 4
	Paula McMahon & Rachael Whitney-Smith	Donna Miller & Stephen Phillip	Ian Hailes	Lesley Stoffels	Shyam Drury	Sheila Griffin & David Dunstan	Alyssa Yow, Han Yow & Ten Scott
	What maths competitions are available in Australia?	Accessing NAPLAN Numeracy	Let's update the Investigation assessment task model	Problem solving in K-2	Powerful problem solving	Making renaming matter in Place value	Singapore mathematics pedagogy: Inquiry-based problem solving
Session 1	3-12	3-9	7-12	K-2	3-6	3-6	K-6
11:00 - 11:55	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
	Dianne Siemon	Warren Beckwith	Blake Segler	Rory Muddle	Alan Sadler	Brian Lannen	Ernest Tan
	Exploring students' mathematical reasoning through horizon problems	Take Sum Risks	Tasks that matter - Differentiation and engagement through rich tasks	Using Minecraft in a mathematics classroom	Differentiation, integration, e^x and confidence intervals	Crashing robot cars for simultaneous linear equations	What's new at Mathspace?
	K-6	3-9	7-10	5-12	11-12	7-12	3-12
	Crown Ballroom 3A	Crown Ballroom 3B	Crown Ballroom 3C	Meeting Room 1	Meeting Room 2	Meeting Room 3	Meeting Room 4
	Rachael Whitney-Smith	Dan Quartermaine	Donna Buckley	Melinda Golinski	Louisa Kennard & Jonelle Mascarenhas	Kenneth Spencer	Ann Ruckert
	Mathematics Curriculum: a 21st century perspective	Our school's Maths YouTube channel	Maths Talent Quest - Working like a mathematician	Developing an integrated STEM inquiry within a Culture of Thinking.	I wonder...Play-based and hands-on maths	Using a number balance to teach algebraic equations	The Big Ideas in Number though picture books
Session 2	K-10	K-10	K-12	K-6	K-6	3-6	3-6
12:05 - 13:00	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
	Lorraine Day	Gregory Hine	Peter Mee	Rom Cirillo	John McGowan & Fiona Thomas	Peter Flynn	Julie Richards
	Rich investigative tasks from Maths300	Proof by contradiction: Professional practice for secondary teachers	Numeracy basics - testing to improve fundamental numeracy skills	Some Investigations I have used in lower secondary	Building powerful digital maths workflows with Desmos, EquatIO and Google	Cubic polynomials are so interesting	Numero - Making maths fun!
	3-9	11-12	3-10	7-10	5-12	11-12	3-10
13:00 - 13:50	**LUNCH - EXHIBITION HALL (Astral)**						
	Crown Ballroom 3A	Crown Ballroom 3B	Crown Ballroom 3C	Meeting Room 1	Meeting Room 2	Meeting Room 3	Meeting Room 4
	Charlie Watson	Eddie Woo	Gary Fullarton	Paul Bowyer	Anne Paterson	Neeti Meghani & Jessica Chiswell	Jacinta Blencowe
	ClassPad tips and tricks	The strength of weak ties (Intimate presentation for primary teachers)	I love mathematics but how about the students?	Teaching maths outdoors	Building connections by differentiating using Think Boards adapted for high school	Anticipatory sets for lower school mathematics	Making connections - planning for an easier maths life!
Session 3	11-12	K-6	7-12	5-9	5-9	7-10	3-9
14:00 - 14:55	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
	David Dunstan	Jody Crothers	Sharon Schubert	Christine Cheng	Andrea van Graan & Bronwyn Nelles	Brett Stephenson	Yuji Takahashi & Lachy Fitzpatrick
	My favourite fraction tasks for years 5-9	7th Heaven	Connecting kids to content and context	An exploration of writing Investigations for learning	OneNote: Ideas for teaching and learning	Jumping kangaroos and the painted cube	Manic Math: A Kahoot-style game for maths
	5-9	5-10	7-10	7-12	7-12	7-12	5-10
	Crown Ballroom 3A	Crown Ballroom 3B	Crown Ballroom 3C	Meeting Room 1	Meeting Room 2	Meeting Room 3	Meeting Room 4
	Derek Hurrell	Penny Crossland	Dion Alfonsi & Blake Cheshire	Kellie Rose & Kelly Medin	Cian O' Gradaigh & Colette Miranda	Shirley Houston	Dan Steele & Dianne Liddell
	Dealing with developing decimal fraction understanding	Designing rich mathematical assessments	Mathematical Investigations by stimulus	Creating memorable maths moments	Magic mental maths	Dyscalculia counts	Bringing learning to life
Session 4	5-9	1-6	5-12	K-9	5-9	K-9	3-9
15:05 - 16:00	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
	Veronica Smith	Brook Johns	Sonia Hueppauff & Fiona Affleck	Peter Fox	Paul Hooper	Reeta Sidhu	Richard Korbosky
	Entrepreneurship in the classroom	Teaching the Mathematical Thinking Process (Mathematics Essential and Foundation)	Thinking Maths - 30 engaging lessons; rich tasks to develop STEM skills and deep learning	Mathemagicians exposed	Getting the most from FX Draw	Free ATO resources for learning and applying mathematics	Brain training maths card games
	7-12	11-12	5-10	5-10	7-12	7-12	K-10
16:00 - 17:30	**MATH MATE NETWORKING DRINKS - ARE YOU A GAMESHOW SUPER STAR? - EXHIBITION HALL (Astral)**						

Note: This is a DRAFT program and is subject to change.
12/08/2019

Monday Keynotes - 9:00 - 10:15

Eddie Woo	Secondary Keynote	Crown Ballroom 2

Motivated reasoning

One of the central challenges to effective mathematics teaching is that we must cultivate an environment and a view of mathematics that motivates students to undertake the work of learning. In this session, we will explore aspects of mathematics that are often under-emphasised but must be recovered to engage a broad range of students in our beautiful and practical subject.

Penny Crossland	Primary Keynote	Crown Ballroom 3A & 3B

Critical and creative thinking in the primary mathematics classroom

Critical and creative thinking is integral to mathematics. It encourages students to think broadly and deeply, reason and justify their understandings. How can we harness critical and creative thinking skills and routines to benefit our learners? This keynote will provide insight into critical and creative thinking and motivate teachers by providing practical examples of how to implement this in the primary school classroom. The presentation will also provide an opportunity for teachers to reflect on their current practices to assist in future mathematics teaching and learning.

Session 1 - 11:00 - 11:55

Paula McMahon & Rachael Whitney-Smith	3-12	Crown Ballroom 3A

What maths competitions are available in Australia?

During this session, learn about the many and varied competitions that are available to extend students' problem-solving and mathematical thinking. Attendees will be provided with samples of each of the competition's questions or information.

Donna Miller & Stephen Phillip	3-9	Crown Ballroom 3B

Accessing NAPLAN Numeracy

The development of the NAPLAN online tests has enabled innovation within the online environment. The tailored tests incorporate a multi-stage computer adaptive test design. This engages students and enables them to show the extent of their achievement. The development of the online tests has presented some challenges to enable them to be accessible for all students. A universal test design enables compliance with international standards. Other accessibility allowances, such as audio capability, enhanced graphics and online tools (ruler, protractor and calculator) will be demonstrated using items from the ACARA demonstration tests.

Ian Hailes	7-12	Crown Ballroom 3C

Let's update the Investigation assessment task model

This presentation will look to boldly go beyond the Investigation assessment task that consists of a Take-home component followed by an In-class validation test. Look to have students connect, collaborate, create and communicate. We'll assume computers have been invented. Scaffolding will come tumbling down. Peer review will prevail. Years 7 to 10 is our training ground for both teachers and students.

Lesley Stoffels	K-2	Meeting Room 1

Problem solving in K-2

This presentation will detail the Problem solving Scope and Sequence developed for Gingin DHS, and the skills and resources we are using to implement this across the school with particular emphasis on K-2. This presentation will emphasise the skills and scaffolding for these year levels and participants will be given a copy of the Scope and Sequence to use in their class.

Shyam Drury	3-6	Meeting Room 2

Powerful problem solving

The Champions of Maths program runs across a year with eight teachers engaged in intensive training through a series of workshops, observations and individual mentoring. The program targets problem solving and reasoning through rich tasks and powerful discussion practices. Learn the approaches that turned primary classroom teachers into experts in effective maths education.

Sheila Griffin & David Dunstan	3-6	Meeting Room 3

Making renaming matter in Place value

Renaming is an important aspect of Place value. This session will be practical, hands-on and engaging with resources and ideas to use in the classroom. Student work samples will demonstrate opportunities to assess students' knowledge.

Alyssa Yow, Han Yow & Ten Scott	K-6	Meeting Room 4

Singapore mathematics pedagogy: Inquiry-based problem solving (Commercial)

Thought leadership and sharing session about Singapore Mathematics Pedagogy history, key milestones and key highlights on consistent success in topping TIMMS and PISA ranking. Inquiry-based problem-solving skills will be the key focus of our presentation and hands-on experience throughout the session. The hands-on experience will be conducted online. Please bring along a laptop, mac or smart device (iPad, Andriod, etc).

Dianne Siemon	K-6	Botanical 1

Exploring students' mathematical reasoning through horizon problems

Evidence from large scale studies suggests that students at earlier levels can tackle problems that would normally be considered appropriate for students at later levels of schooling. I refer to these as horizon problems as they provide windows into students' mathematical reasoning that we might not be aware of otherwise. While horizon problems may be solved using familiar strategies (eg. make-all-count-all), it is their representations that can provide valuable opportunities for making connections and noticing mathematical relationships. This seminar will explore the possibilities afforded by a range of horizon problems.

Warren Beckwith	3-9	Botanical 2

Take Sum Risks (Commercial)

Take Sum Risks is a card game designed to practice simple arithmetic skills, whilst introducing the concept of Chance. It is ideal for middle to upper primary students but is also used to assist year 7 and year 8 students to consolidate their basic number skills. One of the intentions of the game is to enable students at all levels to become in engaged in the task. In this session we look at the basic concepts of the game and how it can be extended to multiples, grouping of numbers and place value.

Blake Segler	7-10	Botanical 3

Tasks that matter - Differentiation and engagement through rich tasks

How do you provide a single task that allows those less proficient to practise the basics, while still challenging more able students in meaningful ways? Furthermore, how do you escape the drudgery of irrelevant textbook-style problems that fail to motivate your students? Rich tasks allow us to overcome these challenges. In this session, we will discuss how rich tasks differ from closed tasks or challenging tasks, strategies for developing rich tasks, and considerations for your classroom. Rich tasks provide meaningful problems that students can explore at multiple levels of understanding, ensuring that the maths that they do matters!

Rory Muddle	5-12	Botanical 4

Using Minecraft in a mathematics classroom

Minecraft: Education edition is available to use in many Western Australian schools at no additional cost to teachers. The software is enthusiastically endorsed by students but may be initially daunting for teachers to use in the classroom. This year I have started creating and using resources in various secondary classes. There have been issues, considerable excitement from the students and, fortunately, practice of mathematical skills and problem solving. I will discuss these experiences, and demonstrate and share resources. Some of the presentation is adaptable to primary school. Optional: Bring a device with Minecraft: Education.

Alan Sadler	11-12	The Studio

Differentiation, integration, e^x and confidence intervals

Do you have students who can differentiate functions but perhaps do not see the purpose of differentiation, who don't know what integration is really all about, who don't seem to appreciate the wonderful exponential function and who are unaware of the usefulness of confidence intervals. I do wonder how well these four topics are being introduced. Can we do a better job? This session will consider these four topics, and perhaps some others.

Brian Lannen	7-12	Studio 1

Crashing robot cars for simultaneous linear equations (Commercial)

OK, we love the algebra of linear equations, and simultaneous equations bring things together in space and time. So let's calculate that space and drive a couple of robot cars into it. If nothing else, it should be fun! TI-Innovator's Rover is a 25cm long vehicle that is driven by an onboard student calculator. The coding for the drive control is done on the calculator, and servo motors and more connect to the TI-Innovator's Hub. Want to find out what this fantastic new mobile maths and STEM solution is all about, then come along to this introductory session and enjoy the ride.

Ernest Tan	3-12	Studio 2

What's new at Mathspace? (Commercial)

2019 has been a year of significant content and product developments at Mathspace, built upon teacher and student feedback gathered over the years. In fact, there have been so many changes that it can be difficult to keep track of them all. This session will cover these changes, from the improved student experience, to the ease of teacher use, to the diagnostics, to the reporting features. This will ensure that teachers who are using Mathspace can continue to have the maximum impact on their students. Prior experience with Mathspace is strongly recommended.

Session 2 - 12:05 - 13:00

Rachael Whitney-Smith	K-10	Crown Ballroom 3A

Mathematics Curriculum: a 21st century perspective

Mathematics curriculum both internationally and within Australia is under review invoking questions like "What mathematics is relevant in the 21st century?", "How can we engage students in learning mathematics?", "How can students retain and transfer their mathematical knowledge beyond the maths classroom?" This workshop hopes to address some of these issues through sharing some international perspectives and exploring how we learn mathematics to best enable retention and transfer of core ideas.

Dan Quartermaine	K-10	Crown Ballroom 3B

Our school's Maths YouTube channel

Problem solving with the year 7 Maths Extension classes using a school-specific YouTube channel and the work behind organising the Servite Math Tube channel. Why have a school-specific YouTube channel(s). Answer include: Collaborating with multiple Learning Areas. Benefits for the classroom and school community. Student enthusiasm using multiple presentations, learning both collaboratively and independently. Discussing possible future learning opportunities to explore, such as using QR Codes for a Maths Trail and cross-curricular collaborations. How to involve other maths teachers in contributing to the channel. Showcasing iMovies and Keynote presentations.

Donna Buckley	K-12	Crown Ballroom 3C

Maths Talent Quest - Working like a mathematician

MAWA's student activity Maths Talent Quest focuses on the process of mathematical investigations. Open to all primary and secondary students, it aims to promote interest in mathematics and foster positive attitudes amongst students, teachers and parents. Looking at real life situations and finding that maths is everywhere helps capture the imagination of both teachers and students alike. MTQ allows students to investigate mathematics on an individual, group or class basis with the opportunity to have fun exploring mathematics in real life situations. This workshop will provide practical ideas to help incorporate MTQ in your classroom.

Melinda Golinski	K-6	Meeting Room 1

Developing an integrated STEM inquiry within a Culture of Thinking.

Best practice pedagogy and a Culture of Thinking combine with positive relationships to create the perfect environment for integrated STEM education in early childhood. This presentation will take educators on a journey of immersion into inquiry. Here, young students are critical researchers, designers, mathematicians and teammates who are able to articulate their thinking as a matter of typical discourse. Key points include the impact of thinking routines on assessment, as well as how thinking routines can be used to provide early childhood students with agency.

Louisa Kennard & Jonelle Mascarenhas	K-6	Meeting Room 2

I wonder...Play-based and hands-on maths

Hands-on workshop with classroom ready ideas and activities to engage and spark wonder, even with reluctant mathematicians. Work with play-based activities and manipulatives from year 1 through to year 6.

Kenneth Spencer	3-6	Meeting Room 3

Using a number balance to teach algebraic equations

In this session, teachers will be using the number balance scales to work through basic equations involving addition and mulitplication. The presenter will be using an interactive version of the manipulative. The session will model a sequence of graduated difficulty.

Ann Ruckert	3-6	Meeting Room 4

The Big Ideas in Number though picture books

The Big Ideas in Number provide the foundation for students' mathematical achievement and should be the focus for targeted teaching in mathematics classes from K-10. Many difficulties faced by students in secondary mathematics classes can be traced back to limited understanding of these big ideas. Student engagement can be effectively increased by using picture books. This workshop will provide examples of picture books that can be used to complement the teaching of each of the Big Ideas in Number, with associated activities which teachers can take away and use.

Lorraine Day	3-9	Botanical 1

Rich investigative tasks from Maths300

Maths300 is a wonderful resource that has nearly 200 rich investigative tasks for use by classroom teachers. Come along and see how you can use some of these tasks in your classrooms, how you can mine the mathematics from the tasks while incorporating differentiation, the proficiency strands and a concrete-representational-abstract approach.

Gregory Hine	11-12	Botanical 2

Proof by contradiction: Professional practice for secondary teachers

This session is underpinned philosophically by the indisputable centrality of proof to the discipline of mathematics. Proof offers students the opportunity to deepen their own understanding of mathematical ideas, to construct and defend logical arguments, and to think critically about the veracity of mathematical statements. Proof by contradiction is a particular mathematical technique taught in Australian senior secondary classrooms (ACMSM025, ACMSM063) which will be explored in this workshop. In particular, several worked examples will be outlined alongside implications for best instructional practice.

Peter Mee	3-10	Botanical 3

Numeracy basics - testing to improve fundamental numeracy skills

Numeracy Basics (NB) testing helps our students improve their fundamental mathematical skills. The test targets mathematics content from the preceding years. A student who masters this will have a solid foundation upon which they can base their learning. To assist students in transitioning to high school, we have created a year 6 NB test for primary schools to use with their students. A click of a button enables a student to generate as many practice tests as they desire to help lift their skills. Participants will see how a NB test works, and student improvement data including impacts on NAPLAN and OLNA, plus receive copies of the year 6 and 7 NB test.

Rom Cirillo	7-10	Botanical 4

Some Investigations I have used in lower secondary

In this session, I will be sharing some of the investigations that I have used and that have worked for me. You will be invited to engage with selected investigations/problems and discuss outcomes/relevance for intended year groups. There will input/discussion opportunity on what makes a 'good' investigation and how to turn some textbook questions into investigations/extended problem-solving activities.

John McGowan & Fiona Thomas	5-12	The Studio

Building powerful digital maths workflows with Desmos, EquatIO and Google (Commercial)

There are many digital tools available: Microsoft Word, PDFs, G Suite tools, online textbooks, test banks and more. How do you merge your existing valuable resources into a digital maths workflow? How do you seamlessly include Desmos features? How do you deliver formative assessment providing more timely and effective feedback to your students? Building deeper student understanding and engagement driven by student choice and response preferences. Join this session to learn a compelling digital maths workflow strategy using EquatIO as the glue to bring together the many elements of your maths teaching toolkit.

Peter Flynn	11-12	Studio 1

Cubic polynomials are so interesting

It is important for students to explore, conjecture and generalize in mathematics. In this workshop, participants will use CAS technology to 'discover' some interesting properties of cubic polynomials. The technology showcased in this workshop is TI-Nspire CAS CX. However, teachers who use other technologies are most welcome to attend and no substantial prior TI-Nspire CAS CX experience is required.

Julie Richards	3-10	Studio 2

Numero - Making maths fun! (Commercial)

Numero is a mental maths resource suitable for all years of primary and secondary education. Numero can play an important role in developing the proficiency strands of the Australian Curriculum Mathematics, especially with fluency, problem solving and reasoning. Numero is ideal for introducing and reinforcing both simple and complex maths concepts within a game situation. The game of Numero will be taught and played at varying levels. Other Numero skills such as solitaire and challenges will also be introduced and explained. Join this session and get the most out of such a valuable resource!

Session 3 - 14:00 - 14:55

Charlie Watson	11-12	Crown Ballroom 3A

ClassPad tips and tricks

This workshop will revisit some classic ClassPad tips and tricks relevant to upper school teachers and their students. From shift keys to sliders and eActivities to programs, we'll delve into most of the apps with the aim of working more efficiently and getting the results that we're after. Participants are welcome to bring their own ClassPad and try out tips as we go or you may prefer to just sit back, take a few notes and try by yourself later.

Eddie Woo	K-6	Crown Ballroom 3B

The strength of weak ties (Intimate presentation for primary teachers)

Being a generalist teacher is a two-edged sword. There are few things as gratifying as seeing students appreciate the wonderful connections between key learning areas; but there are few things harder than knowing the expansive curriculum well enough to identify, and authentically teach, those links between concepts. In this session, we will unpack some of the surprising connections from mathematics to the rest of the learning in which our students engage.

Gary Fullarton	7-12	Crown Ballroom 3C

I love mathematics but how about the students?

One of our biggest challenges in teaching mathematics is to engage our students. How can we impart our passion and love of mathematics onto our students? I will share some attempts that I have made to show students why I love mathematics and why maths matters to me. I will look at some investigations, statistical investigations and response questions I have set up which show how I use mathematics to solve problems in my world in an attempt to get students engaged and to appreciate mathematics. I will also share some anecdotes and philosophies I have accumulated in over 25 years of teaching mathematics.

Paul Bowyer	5-9	Meeting Room 1

Teaching maths outdoors

Letting maths escape from the classroom into the playground and beyond is liberating! This presentation will provide some ideas for teaching lessons outside.

Anne Paterson	5-9	Meeting Room 2

Building connections by differentiating using Think Boards adapted for high school

Do you need ideas for differentiation to cater for a range of needs and learning styles (ie. visual, aural and kinesthetic), and to allow for creativity and keep low-ability students engaged? Starting with mental maths open questions - presented so that all students can succeed - to Derek Haylock's Think Board for high school students. Murdoch University's senior school NAG teaching strategy links number and algebra and graphs. The Think Board for middle school students further links the language of stories or context (SNAG). Participants will be able to complete their own Think Boards for linear relationships for real-world experiences, tables of values, graphs and equations.

Neeti Meghani & Jessica Chiswell	7-10	Meeting Room 3

Anticipatory sets for lower school mathematics

Madeline Hunter's Anticipatory set (hook) grabs the student's attention. The purpose of the anticipatory set is to focus students' attention on the lesson, especially students who are not engaged in learning. Anticipatory sets can also establish a readiness for what is to follow. For the "hook"•to do so, it must pique students' interest. This workshop exposes you to a variety of "hooks" for a range of mathematical topics. The topics will link directly to the Mathematics Curriculum for Year 7 -10.

Jacinta Blencowe	3-9	Meeting Room 4

Making connections - planning for an easier maths life!

There are lots of connections within the curriculum which naturally fall together eg. area and multiplication. When we take advantage of these connections we can develop a curriculum plan that helps us to 'fit everything in'•and give context to student learning. Spiralling, or interleaving the curriculum, gives teachers and students the opportunity to revisit and build upon their learning. Come and explore these concepts that can help make life easier for teachers. Play around with unit ideas that take advantage of the 'big ideas' in maths and leave with some inspirations to change the way you plan your teaching to cover the curriculum.

David Dunstan	5-9	Botanical 1

My favourite fraction tasks for years 5-9

This workshop will showcase tasks that will connect fractions with decimals, percentages and estimation skills for middle school students. Participants will work both independently and in small groups, using materials such as cards, in this hands-on session.

Jody Crothers	5-10	Botanical 2

7th Heaven

This session will focus on a variety of year 7 activities. With only year 7s at my brand new school, I have had a real focus on engagement and establishing new positive practices within mathematics. I will share my school's journey this year as we develop a problem-solving culture, implement Back-to-Front Maths and discover all things that we didn't know we needed. You will leave this session with access to activities you can use immediately and a variety of ideas that you can take back to your school to ponder on implementing.

Sharon Schubert	7-10	Botanical 3

Connecting kids to content and context

This workshop will focus on why providing real-world context is critical to engaging students and important for mathematical understanding. We will explore how the curriculum can be designed and adjusted to emphasise authentic applications, highlighting the rich mathematics in everyday life and work.

Christine Cheng	7-12	Botanical 4

An exploration of writing Investigations for learning

Are you running out of ideas for writing investigations? Demonstrated with examples of investigations which have been successfully implemented in the classroom, this presentation aims to offer you some inspiration for investigation ideas which would enable students to draw deeper connections between various mathematics concepts, as well as between mathematics and other disciplines. As a result of sharing and reflecting on our experiences, this workshop will hopefully create an abundance of ideas from which we can all gather a few 'take-aways'•and thus refine our practices accordingly.

Andrea van Graan & Bronwyn Nelles	7-12	The Studio

OneNote: Ideas for teaching and learning

As teachers we are encouraged to use new technology to improve our teaching and students' learning. The options available can be overwhelming and difficult to navigate. We have been using OneNote in our mathematics classes to distribute content and resources. During this session, we will show you some of the ways that we use OneNote in our classrooms. We will also include some of the tools included in the software that make organising content, sharing work and providing fast and individualised feedback.

Brett Stephenson	7-12	Studio 1

Jumping kangaroos and the painted cube

This workshop will showcase two investigations that can be used to introduce or consolidate polynomial functions. The jumping kangaroos is interactive and extends from a single variable function solution (same number each side) to a two variable function solution (any number each side). The painted cube activity will consider the number of painted faces (how many visible) with different size cubes (a variety of cubes will be available but feel free to bring your own). Casio ClassPads will be the technology tool of choice to look for patterns in the data that is generated but any graphing technology could be used.

Yuji Takahashi & Lachy Fitzpatrick	5-10	Studio 2

Manic Math: A Kahoot-style game for maths (Commercial)

Engaging high school students with maths is difficult. Numerous studies have shown that student performance increases when engagement increases. This makes improving student engagement with maths both an important and challenging problem to solve. Math Mate is developing gamified learning apps for high school students that encourage play, exploration and interactivity when learning algebra. By the end of the showcase, participants should be able to: describe how gamified maths tools can improve student engagement; identify and assess the value propositions of interactive maths software; and leave with a fun, new tool at their disposal.

Session 4 - 15:05 - 16:00

Derek Hurrell	5-9	Crown Ballroom 3A

Dealing with developing decimal fraction understanding

A misunderstanding of decimal fractions can be hidden by a having a reasonable level of procedural fluency, but can inhibit a student's capacity to be involved in middle school mathematics. It is important for students to master decimals to improve their learning in more advanced mathematics. However, students (and adults) often have difficulty understanding decimals (Durkin & Rittle-Johnson, 2014). In this hands-on session, we will look at some of the misconceptions that students can hold about decimal fractions, and then engage in activities that work towards developing an understanding of decimal fractions.

Penny Crossland	1-6	Crown Ballroom 3B

Designing rich mathematical assessments

Assessment plays a key role in identifying the new types of mathematics learning students must achieve and allows them to demonstrate their current understandings. What sort of assessment are available to us as mathematics teachers? What are the benefits of some of these different tools? How can we design and use rich assessments which provide opportunities for students to demonstrate deep understandings, and analyse these to move their learning forward? This workshop will provide some strategies, tools and opportunities for conversations around this vital mathematics topic.

Dion Alfonsi & Blake Cheshire	5-12	Crown Ballroom 3C

Mathematical Investigations by stimulus

Conducting a mathematical investigation (informal or formal) can be quite a challenging feat, for both teachers and students. In this workshop, we will explore mathematical investigations using a 'stimulus' or a 'prompt' to encourage deep thinking, promote further effective questioning and welcome students to engage with the depths of our mathematics curriculum. We will define what it means to have a 'rich mathematical stimulus' and examine some common investigation-based processes that are useful when designing assessable tasks, as well as the pedagogical strategies involved in implementing informal investigation activities.

Kellie Rose & Kelly Medin	K-9	Meeting Room 1

Creating memorable maths moments

This presentation will demonstrate some of the fun, easy and interesting ways teachers can use Prowise Presenter to create interesting and flexible maths lessons. Lessons will be provided that have been created by Australian teachers and there will be practical opportunities to see how easily teachers can engage students in meaningful activities.

Cian O'Gradaigh & Colette Miranda	5-9	Meeting Room 2

Magic mental maths

Simple to teach tricks and strategies your students will love to learn. These methods improve speed and accuracy enabling your students to improve their performance in competitions and timed challenges. They will love to learn them because they can baffle their buddies with brilliance, dazzle dad with their dexterity and mesmerise mum with multiplication. Who doesn't want to be the teacher who shared that?

Shirley Houston	K-9	Meeting Room 3

Dyscalculia counts

Dyscalculia, a specific learning disability in mathematics, is less recognised and understood than dyslexia, a specific learning disability in reading, despite similar incidence. To a large extent, this is due to the pervasive impression that maths performance matters less than reading performance. The reality is that the economic consequences of dyscalculia are as severe as those for dyslexia. This presentation will familiarise participants with the characteristics of dyscalculia. It will demonstrate teaching strategies that develop number sense, in particular the use of manipulatives, such as those created by Math-U-See.

Dan Steele & Dianne Liddell	3-9	Meeting Room 4

Bringing learning to life (Commercial)

This presentation is focused on helping teachers develop learning units to engage students, provide real-world experiences of maths and deepen mathematical concepts, strategies and skills. Participants will be provided with resources and materials to support them in developing engaging mathematical units and learning experiences from years 3-8. Finally, participants will be provided with the opportunity to collaborate with others to develop potential learning units, identifying ideas, skills and learning/teaching considerations for maths learning units. All participants will receive access to all examples developed within the workshop.

Veronica Smith	7-12	Botanical 1

Entrepreneurship in the classroom

This presentation is designed to inspire educators to embrace an entrepreneurial mindset and framework when delivering the mathematics curriculum. Rapid change requires young people to be responsive and agile in order to achieve the work and life skills current and future employers will expect of them. A high quality Enterprise Education framework provides opportunities for mathematics to be learned in ways that are innovative, purposeful and forward thinking, and will inspire and support the aspirations of this Generation Z, said to be the most entrepreneurial of any generation.

Brook Johns	11-12	Botanical 2

Teaching the Mathematical Thinking Process (Mathematics Essential and Foundation)

A hands-on look at how to incorporate the Mathematical Thinking Process into everyday classroom tasks for Mathematics Essential and Foundation courses.

Sonia Hueppauff & Fiona Affleck	5-10	Botanical 3

Thinking Maths - 30 engaging lessons; rich tasks to develop STEM skills and deep learning

Improving students' abilities to think, reason and problem solve are fundamental requirements of education in the 21st century. Thinking Maths (TM) is an educational intervention program based on cognitive acceleration (CA) theory and was developed through research. TM is carried out in 30 maths lessons over a two-year period (years 7 and 8). Lessons are hand-on, rich, engaging and promote: deep learning, metacognition, classroom discussion, pair/group work, critical thinking. You will engage in a TM lesson and learn about the fundamentals of CA. Thornlie SHS began the journey in 2017 and has incorporated it into their school planning. You will hear from their numeracy co-ordinator about their experence.

Peter Fox	5-10	Botanical 4

Mathemagicians exposed

A special group of magicians referred to as Mathemagicians entertain audiences creating illusions of computational wonderment. Their theatrical cousins, Mathemagicians have a number of techniques, or techniques of number? A range of mathematical concepts and techniques can be taught using magic, 'mathemagic', developing a sense of excitement and inquiry that increases student engagement; promotes discussion and spikes dopamine levels in the brain resulting in improved memory retention. This session will cover secrets behind a series of mathematical tricks exchanging sleight of hand for cerebral gymnastics and an apparent mentalist persona.

Paul Hooper	7-12	The Studio

Getting the most from FX Draw (Commercial)

This lesson is designed to help you get the most out of FX Draw. We will be concentrating on providing tricks and tips that will make you much more productive with the software, even if you are a "guru". We will also present some of the newer features that you may not have seen. Finally, we will present some new ways of using FX Draw to support online accessible teaching, as well as in-class demonstrations. If you only use FX Draw to insert diagrams into Word, you will discover a host of new ways to use your FX Draw knowledge.

Reeta Sidhu	7-12	Studio 1

Free ATO resources for learning and applying mathematics

The Australian Taxation Office offers free resources for teachers and students on a range of taxation and superannuation topics aligned to the Western Australian Curriculum. These resources offer real-life contexts for learning and applying mathematics, and include both online and print lessons and activities. In this workshop, you will be shown how you can access and use these resources to support learning in your classroom. Recent enhancements, including new mathematics activities, will also be showcased.

Richard Korbosky	K-10	Studio 2

Brain training maths card games

A strategy that works and is fun for learners - The maths card games improve students' fluency, understandings and basic facts across a number of different mathematical ideas using different representations. The maths cards include aspects of subitising, partitioning, whole number, number sentences, word problems, doubling, halving, problem solving, times tables, fractions, decimals and percentage.

2019 MAWA CONFERENCE: Secondary - Tuesday 19 November

Start at 8:00	**REGISTRATIONS - Convention Centre Foyer**							
	Crown Ballroom 2							
8:45 - 9:00	Opening Ceremony: Wendy Pero - MAWA Conference Convenor Welcome: John West - President of MAWA							
	Crown Ballroom 2					The Studio	Studio 1	Studio 2
9:00 - 10:15	KEYNOTE: Eddie Woo - Motivated reasoning (REPEAT of Monday's keynote)					Dianne Siemon & Lorraine Day Evidenced-based resources to support mathematical reasoning in years 5-10	Rachael Whitney-Smith Mathematics Curriculum: a 21st century perspective	Paula McMahon Swings and roundabouts!
10:15 - 10:50	**MORNING TEA - EXHIBITION HALL (Astral)**							
	Crown Ballroom 2	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
Session 1 11:00 - 11:55	Charlie Watson Computing statistics is simple; interpretation tends to be the problem 11-12	Brook Johns Lower school Investigations 5-10	Gregory Hine You can handle the proof: Teaching proof by induction 11-12	Donna Buckley The secret science of cryptography 5-10	Stephen Flavel Arithmetic to algebra 5-9	Dianne Siemon You don't need to differentiate everything; it's the Big Ideas that make a difference! K-9	Evelyn Pedroli Teaching with and for creativity in mathematics 7-12	Nick Bell Getting hands-on with Education Perfect Mathematics 7-10
	Crown Ballroom 2	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
Session 2 12:05 - 13:00	Dion Alfonsi A spirit of inquiry in the mathematics classroom (reSolve) 7-10	Megan West Using technology to enhance problem solving 7-10	Tim Riessen & Chris Hodson Making maths real at TAFE 7-10	Colette Miranda & Susan Teo How to write a mathematics Investigation for years 11-12 11-12	Tyril Houghton Impact in senior school of misconceptions in fractions 7-12	Alan Sadler Are you ... ? and other questions 7-12	Peter Fox Lessons from CAS 7-12	John Lawton & Richard Korbosky Overcoming confusion with the Mathomat protractor through a better understanding of angle 5-9
13:00 - 13:50	**LUNCH - EXHIBITION HALL (Astral)**							
	Crown Ballroom 2	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
Session 3 14:00 - 14:55	Eddie Woo Mathematical playfulness in 52 cards or less 7-12	Norm Hoffman An old hand looks at the teaching of Deductive geometry 7-10	Peter Merrotsy Lessons from Liu Hui 7-12	Jack Bana Using 'Have Sum Fun' to support problem solving 7-10	Robert Rook Using computers in a maths classroom with year 11-12+ students 11-12	Kylie Bice Differentiated practice: How to differentiate for diverse-ability classrooms K-10	John West Problem solving and competition mathematics 3-10	Robert Yen & Glenn Watson Unpacking Nelson senior maths for Mathematics Essential 11-12
	Crown Ballroom 2	Botanical 1	Botanical 2	Botanical 3	Botanical 4	The Studio	Studio 1	Studio 2
Session 4 15:05 - 16:00	Paul Brown An absolutely amazing experience - National Mathematics Summer School 7-12	Ian Hailes What matters in Making Maths Matter 7-12	Leith Pavlinovich & Anne-marie Benson The delivery and assessment of the Mathematics Foundation course 11-12	Jesslyn Heath Creating ATAR Investigations 11-12	Vicky Kennard Using manipulatives in the high school classroom 5-10	Wendy Pero Embedding the mathematics proficiency strands into teaching and assessment 7-10	Jody Crothers Robots vs mathematics 5-10	Samantha Dodras From time travel to orchestra of straws: Mathematical experiments in the classroom 7-10
16:00 - 17:30	**NETWORKING DRINKS - EXHIBITION HALL (Astral)**							

Note: This is a DRAFT program and is subject to change.
12/08/2019

Tuesday Keynote & Concurrent Sessions - 9:00 - 10:15

Eddie Woo	Secondary Keynote	Crown Ballroom 2

Motivated reasoning

One of the central challenges to effective mathematics teaching is that we must cultivate an environment and a view of mathematics that motivates students to undertake the work of learning. In this session, we will explore aspects of mathematics that are often under-emphasised but must be recovered to engage a broad range of students in our beautiful and practical subject.

Dianne Siemon & Lorraine Day	5-9	The Studio

Evidenced-based resources to support mathematical reasoning in years 5-10

This session will provide an overview of the evidenced-based resources produced by the Reframing Mathematical Futures II project to support the teaching and learning of mathematical reasoning in years 5 to 10. In particular, it will illustrate the learning progressions for algebraic, geometrical and statistical reasoning and explore the formative assessment options and teaching advice produced as a result of the project. Participants will have an opportunity to consider student responses to the assessment options.

Rachael Whitney-Smith	K-10	Studio 1

Mathematics Curriculum: a 21st century perspective

Mathematics curriculum both internationally and within Australia is under review invoking questions like "What mathematics is relevant in the 21st century?", "How can we engage students in learning mathematics?", "How can students retain and transfer their mathematical knowledge beyond the maths classroom?" This workshop hopes to address some of these issues through sharing some international perspectives and exploring how we learn mathematics to best enable retention and transfer of core ideas.

Paula McMahon	7-12	Studio 2

Swings and roundabouts!

How many times have we said teachers need more time to: research hands-on activities, teach our students to investigate, find new resources, develop assessment items and to stop reinventing the wheel. But there are always roadblocks! In this session, I will give you some suggestions to break through some of the roadblocks and enjoy flying on the swing or whirling on the roundabout. Most importantly, I want to hear what MAWA can do, as an association, to support you in crashing through the roadblocks.You are guaranteed to leave with some freebies!

Session 1 - 11:00 - 11:55

Charlie Watson | 11-12 | Crown Ballroom 2

Computing statistics is simple; interpretation tends to be the problem

A few years ago, 120 researchers and 400 undergraduates were presented with six false interpretations of a confidence interval. On average, the group endorsed more than three of the six falsehoods, with researchers worse than undergraduates. If PhD researchers struggle with inference, what hope is there for senior students studying Applications to identify an association or for those studying Methods and Specialist to interpret a confidence interval? This session will explore statistical inference, highlight useful resources in developing understanding and discuss recent assessment items from ATAR examinations around the country.

Brook Johns | 5-10 | Botanical 1

Lower school Investigations

A practical look at how to develop your students investigative skills. This workshop will also look at how to create assessments and marking rubrics for the Mathematical Thinking Process.

Gregory Hine | 11-12 | Botanical 2

You can handle the proof: Teaching Proof by induction

In this session, some useful approaches for educators teaching the year 11 Mathematics Specialist topic of Real and Complex Numbers will be presented and explored. Consistent with the Australian Curriculum: Mathematics which has been taught in Western Australian schools since 2015, the sub-topic of Proof by Mathematical Induction (2.3.4, 2.3.5 & 2.3.6) will be the focal point. Although this session is intended primarily for those preparing to teach this content for the first time, all are welcome to attend.

Donna Buckley | 5-10 | Botanical 3

The secret science of cryptography

When Alice and Bob want to share a secret they use encryption methods to make sure Eve, the eavesdropper, does not read their message. The battle between codemakers and codebreakers is ancient and this workshop will introduce you to this hidden science. In this workshop you will: discover the history of cryptography and its role in the development of modern technology; participate in activities that develop students' problem-solving and critical thinking; unpack the importance of number theory in cryptography; and explore exciting career opportunities for students in cybersecurity.

Stephen Flavel | 5-9 | Botanical 4

Arithmetic to algebra

This workshop will explore a number of Maths300 lessons that start with a very low entry level and then move to the abstract world of algebra.

Dianne Siemon | K-9 | The Studio

You don't need to differentiate everything; It's the Big Ideas that make a difference!

Formative assessment holds the key to improving mathematics learning outcomes but not everything needs to be assessed formally and not everything needs to be differentiated. Targeted teaching is specifically concerned with addressing students' learning needs in relation to a big idea in Number without which their progress in school mathematics will be seriously impacted. This seminar will revisit the Assessment for Common Misunderstanding materials and tease out the key underpinning ideas and strategies needed at different levels of schooling to ensure students make the shift from additive to multiplicative reasoning.

Evelyn Pedroli | 7-12 | Studio 1

Teaching with and for creativity in mathematics

Many schools are focussing on the broader capabilities that our young people will need to acquire during their schooling; capabilities that they will need to be successful contributors to society and to confidently build for themselves the future that they want. One of these is creativity. In this session, we will unpack what creativity means and the skills and dispositions required for creativity. We will explore how these might be demonstrated and fostered by mathematics teachers in the classroom. Participants should come away with a range of ideas and resources based on teaching with and for creativity in mathematics.

Nick Bell | 7-10 | Studio 2

Getting hands-on with Education Perfect Mathematics (Commercial)

The use of hands-on activities in maths can help to boost student engagement and provide them with a bridge between the concrete and abstract levels of many mathematical topics. The kinesthetic and visual experiences that are offered when students take part in hands-on activities in Maths support students' retention and recall of important mathematical procedures, facts, and understandings.

Session 2 - 12:05 - 13:00

Dion Alfonsi	7-10	Crown Ballroom 2

A spirit of inquiry in the mathematics classroom (reSolve)

If you are interested in learning about the reSolve: Mathematics by Inquiry project and the use of their classroom resources, come along! The reSolve protocol and resources provide opportunities in everyday mathematics teaching and learning that help bring the big mathematical ideas and the mathematical proficiencies to the forefront of maths education. In this workshop, we will interrogate and model some of the reSolve classroom resources and have the time to start thinking about a lesson of your choice, one that will highlight a "spirit of inquiry" in your classroom!

Megan West	7-10	Botanical 1

Using technology to enhance problem solving

This session will involve a variety of activities to enhance students' problem-solving and thinking skills. Some activities require a ClassPad or TI-Nspire or other graphing calculators, and others involve some pen and paper. Activities are aimed at students from years 7 to 10 and are designed to encourage the students to be curious and ask questions about why and how the mathematics work. You can take lessons away with you and use them or alter them, and start telling your students "that is a great question, let's find out more".

Tim Riessen & Chris Hodson	7-10	Botanical 2

Making maths real at TAFE

Our courses are stepping stones to either employment or further study. Making numeracy relevant is an ongoing focus to ensure students are engaged with relevant mathematical skills. The session aims to demonstrate some of the ways we seek to make this happen.

Colette Miranda & Susan Teo	11-12	Botanical 3

How to write a mathematics Investigation for years 11-12

Are you wondering how to write a mathematics investigation for year 11 and 12 that satisfies the key behaviours as described in the SCSA grade descriptors? In this session, I will discuss Investigation ideas for both Mathematics Essential (Practical Application and Statistical Investigation) and Mathematics Applications. Sample investigations will be given along with marking rubrics/solutions which meet the standard according to the WA course requirements.

Tyril Houghton	7-12	Botanical 4

Impact in senior school of misconceptions in fractions

Senior students in Mathematics Methods are losing valuable marks due to errors based on misconceptions in the correct use of fractions. This affects solutions to trigonometric equations, differentiation and integration, and often the student demonstrates a flaw in the correct use of fractions at this higher level of mathematics. Are you interested in discussing ways to fix this? Do you want to know where these errors occur and why? If you are teaching in the middle and lower secondary school, come along and see how poor numeracy skills in fractions impact your students in their future study of mathematics and how we can change this.

Alan Sadler	7-12	The Studio

Are you ... ? and other questions

I maintain that the most important thing that you take into the classroom is yourself. So are YOU making the best use of yourself? In this session, I consider a number of these "Are you" questions and will present a number of ideas that you might like to put into action in your classroom. Are you ... boring? Are you ... getting your students active? Are you ... making the links explicit? Are you ... taking things into class? Are you ... teaching understanding or teaching routines? Are you ... rewarding good mathematics? etc, etc.

Peter Fox	7-12	Studio 1

Lessons from CAS

Introducing CAS into mathematics classrooms is a lot more involved that simply identifying what buttons to press and what platform to use. Enormous pedagogical and paradigm shifts may need to take place. It can also be a challenging time for students, depending on the stage of their mathematical journey. This workshop draws on 17 years of working with CAS in the teaching and learning of mathematics. Examples of problems and challenges, mathematically and pedagogically, for teachers and students will be explored. Participants will be able to take away a series of problems for their students to explore from years 7 to 12.

John Lawton & Richard Korbosky	5-9	Studio 2

Overcoming confusion with the Mathomat protractor through a better understanding of angle (Commercial)

Student's understanding of angle is made difficult by the absence of a single definition of it as a target quantity. This workshop focuses on how students develop a concept of this important, but often poorly understood, measurement quantity. We explore the several different concepts of angle that need to be understood in middle school. Our workshop show how students can unify these concepts into a single, visually-based, understanding of angle through drawing activities using the Mathomat template and its associated student book. The aim of these activities is to overcome the problem, identified in major research studies, that the structure and purpose of protractors as a tool are opaque to many students; leading to greater skill and confidence with the use of protractors as a tool. This workshop uses the new Mathomat v2 geometry template and student book.

Session 3 - 14:00 - 14:55

Eddie Woo	7-12	Crown Ballroom 2

Mathematical playfulness in 52 cards or less

Playfulness can be used as a powerful context for mathematical reasoning and conversation. In this session, we will explore some of those conversations using just a standard deck of playing cards.

Norm Hoffman	7-10	Botanical 1

An old hand looks at the teaching of Deductive geometry

With more than sixty years involvement in school mathematics, I will analyse and comment on a number of basic aspects of the nature of deductive geometry and its teaching. Participants will have the opportunity to raise issues. What is the essence of deductive geometry? Should all students study it? Why are congruent triangles such an important part of deductive geometry? How are problems solved in deductive geometry? Do all results need to be proved?

Peter Merrotsy	7-12	Botanical 2

Lessons from Liu Hui

Liu Hui was a Chinese mathematician who lived in the 3rd century. In this workshop, we will replicate three of his important contributions, each suitable for a range of secondary year levels. The first is a beautiful application of the properties of a parallelogram to surveying. The second is a dissection method to determine the volume of a pyramid. The third applies some readily accessible algebra to determine the volume of a particular shape that almost yields the volume of a sphere, and along the way provided foundational ideas important for the development of integral calculus.

Jack Bana	7-10	Botanical 3

Using 'Have Sum Fun' to support problem solving

Problem solving is considered to be the heart of mathematics, yet it rarely gets the attention it deserves in the teaching and learning of mathematics. In this session, we will examine all the problem-solving strategies that can be used in the classroom, and also indicate sources of problem-solving experiences for students in years 7-10. We will look at problems used in teh 'Have Sum Fun' competitions and you will also be given a set of 30 problems suitable for your mathematics classroom.

Robert Rook	11-12	Botanical 4

Using computers in a maths classroom with year 11-12+ students (Commercial)

Among the topics covered are graphing, calculus, consumer maths, complex numbers, distributions, functions, parametric and polar graphs, regression, statistics (junior & senior), modelling data, trigonometry, probability and vectors to name a few. Use of the senior worksheet generator (year 12), topic revision/test program, homework book generator will be explained. Questions are randomly generated giving an infinite number of questions with not only answers but full solutions. All attendees will receive a free registered copy of the latest software for their home computers.

Kylie Bice	K-10	The Studio

Differentiated practice: How to differentiate for diverse-ability classrooms

Differentiation is a vital skill for all teachers in Australian classrooms, where the range of student abilities, interests and needs are so varied, including students with disability and those who may be gifted and/or talented. Teachers are now expected to differentiate in their diverse-ability classrooms, however many are asked to do this with limited training, or without knowing how to connect differentiated practice to other aspects of teaching. In order for differentiated practice to be effective, it must be systematic and the lens through which other teacher tasks, such as assessment and program design, are practised.

John West	3-10	Studio 1

Problem solving and competition mathematics

In this session, I will share my experiences from the inaugural AAMT Singapore study tour (April 2019) and explain why it revealed that Australian teachers are among the best in the world. I will showcase new MAWA products and resources that encourage hands-on learning and developing students' maths skills at home. I will also seek your input on the direction you would like to see MAWA head in 2020 and beyond.

Robert Yen & Glenn Watson	11-12	Studio 2

Unpacking Nelson senior maths for Mathematics Essential (Commercial)

Nelson Senior Maths has been updated and revised specifically for the WA Mathematics Essential course. Learn about how these new editions have been designed to embrace the objectives and spirit of the syllabus, to cater for the learning styles of the students taking this course. We will showcase the features of this innovative series: thematic chapters, problem-solving focus, numeracy and literacy activities, classroom investigations, real-life applications, video tutorials, chapter quizzes and question banks.

Session 4 - 15:05 - 16:00

Paul Brown	7-12	Crown Ballroom 2

An absolutely amazing experience - National Mathematics Summer School

What has the National Mathematics Summer School got to offer your students? We will hear from students who have attended. The feedback over many years has been extremely positive. Participants will find out what the selection panel looks for in candidates, and what the NMSS experience is like. Outstanding mathematicians can appear in any school and the NMSS should be an aspiration for our top year 11 students.

Ian Hailes	7-12	Botanical 1

What matters in Making Maths Matter

We need more curiosity, imagination and passion. These naturally lead to inquiry, modelling, creating, investigating, problem solving and innovation. If you can add and are observant, I have a couple of problems that will take you all the way from long addition, via parity, algebra, topology, partitioning and combinatorics, to simulation and coding.

Leith Pavlinoch & Anne-marie Benson	11-12	Botanical 2

The delivery and assessment of the Mathematics Foundation course

Teaching students who simply 'do not get it' can be a challenge for teachers of the Mathematics Foundation course. In this session, we will work through some of the strategies and the mathematical thinking processes that support the intended delivery, assessment and grading of the Foundation course. Focus will be given to the assessment types of this course, as outlined by the School Curriculum and Standards Authority.

Jesslyn Heath	11-12	Botanical 3

Creating ATAR Investigations

Stuck on how to create new investigations or strapped for time? In light of recent developments in regard to investigations, I have created (or adapted) and implemented a variety of investigations for ATAR courses and trialled various versions of rubrics. This session will provide you with a brief rundown of what worked well (and what didn't) and possible investigations, rubrics and ideas to take with you.

Vicky Kennard	5-10	Botanical 4

Using manipulatives in the high school classroom

Teachers stop using manipulatives in the early grades. I believe that students of all ages would benefit from using a variety of manipulatives. Yet in classrooms and resource rooms there are shelves of unused resources. The reason for both situations is that teachers feel using manipulatives is difficult to organise and manage, take time and that teachers do not know how to use them to elicit deeper thinking. In this workshop, we will, together, explore a few of the commonly found manipulatives, and maybe some more unusual ones, to see how we can use them with greater effect to enhance student learning, thinking and engagement.

Wendy Pero	7-10	The Studio

Embedding the mathematics proficiency strands into teaching and assessment

This session will explore what is meant by the Western Australian Curriculum mathematics proficiency strands. Participants will review a sample task to understand how the proficiency strands can be used to access the mathematical content and to enrich teaching and assessment.

Jody Crothers	5-10	Studio 1

Robots vs mathematics

Problem solving, persistence and resilience along with algorithmic thinking. I can't get them to try a difficult question more than once but they will attempt to solve a challenge with the TI-Rover robot over and over again. You will have a chance to do some simple coding in the session and discuss various ideas for use within the classroom. You will leave with ideas and hopefully some inspiration.

Samantha Dodras	7-10	Studio 2

From time travel to orchestra of straws: Mathematical experiments in the classroom

The focus of this presentation is on sharing some mathematical experiments to run in the classroom. Some of the ideas have been woven from scientific experiment threads, cut and tailored to fit the WA high school maths curriculum. Fractions and average speed help students experience a time travel, the notion of permutations will be a great conductor of the orchestra of straws and more to come, because the best way to believe maths matters is to see it for yourself!

Numeracy Leaders K-12 and HOLA Forum - Wednesday 21 November

Start at 8:00	**REGISTRATIONS - Convention Centre Foyer**		
8:40 - 8:55	Astral 3 Opening Ceremony: Paula McMahon - MAWA Executive Officer Welcome: John West - President of MAWA		
Session 1 9:00 - 10:00	Astral 2 Lorraine Day **Supporting OLNA by revisiting multiplicative thinking**	Astral 3 **Secondary Showcase**	The Studio **Numeracy Showcase One**
10:00 - 10:30	**MORNING TEA - EXHIBITION HALL (Astral 1)**		
Session 1 Cont. 10:30 - 12:00	Astral 2 Lorraine Day **Supporting OLNA by revisiting multiplicative thinking**	Astral 3 **Secondary Showcase**	The Studio **Numeracy Showcase One**
12:00 - 13:00	**LUNCH - EXHIBITION HALL (Astral 1)**		
Session 2 13:00 - 15:30	Astral 2 **Secondary Update and Faciliated Discussion**	Astral 3 **Facilitated Discussions**	The Studio Ann Ruckert **Numeracy Showcase Two**
Plenary 15:30 - 15:45	Astral 3 Prize Draw and Close: Paula McMahon		
15:45 - 17:00	**SUNDOWNER - EXHIBITION HALL (Astral 1)**		

Wednesday 21 November

SESSION 1: 9:00 - 12:00

Lorraine Day — Primary & Secondary — Astral 2

Supporting OLNA by revisiting multiplicative thinking

Multiplicative thinking is the single most important predictor of students' success in mathematics, as it underpins so much of the mathematics curriculum. In the P – 12 mathematics curriculum 53% of the content descriptors require an ability to think multiplicatively. In Years 7 – 10 this percentage increases to 72%. In the Year 7 Number strand twelve of the thirteen content descriptors require an ability to think multiplicatively. This means that students entering Year 7 who are pre-multiplicative do not have access to the mathematics expected of them. Multiplicative thinking should be evident in students about Year 4, but research is showing us that between 35% (SNMY, 2006) and 55% (RMF, 2014) of Year 8 students do not have access to multiplicative thinking. If we want these students to be able to access secondary mathematics then we need to address this issue urgently.

Astral 3

Secondary Showcase

During this session three presenters will showcase aspects of their school mathematics program or inventions to support students in mathematics. This will all be in a secondary context but most could be replicated in the primary setting.

The Studio

Numeracy Showcase One

During this session three presenters will showcase aspects of their school numeracy strategies, mathematics improvement program and/or intervention program. There will be both primary and secondary contexts.

SESSION 2: 13:00 - 15:30

Astral 2

Secondary Update and Facilitated Discussion

Secondary Update – SCSA update and Cyber Experience presentations.

Facilitated Discussion – Let's look at and talk about the 10 and 10A course – teaching, reporting and assessing.

Astral 3

Facilitated Discussions

This is an opportunity for teachers to discuss with colleagues some of the issues that have been identified.

• Discussion Group 1 – Lower School Assessments and Grading

• Discussion Group 2 – Lower school Assessments

Upper School Assessments – During this time groups will have time to brainstorm ideas, resources and marking key ideas for ATAR courses. These information from these discussions will be collated and shared after the conference.

Ann Ruckert — The Studio

Numeracy Showcase Two

During this session three presenters will outline some of the ways systems are supporting teachers with numeracy.

Ann Ruckert

This session will highlight the ways in which the SA Department for Education is supporting its schools' improvement through the creation of excellent online resources and support provided by the Learning Improvement Division. Participants will gain an understanding of best practice in supporting students' numeracy development.