The Mathematical Association of South Australia Inc

Annual Conference 2017

27th & 28th APRIL

URRBRAE AGRICULTURAL HIGH SCHOOL
505 Fullarton Road, Netherby

PROGRAM 2017

Day 1 Thursday, 27th April 2017

8:30 am – 9:00 am   **Registration** – The Shed - tea and coffee available

/ **visit Trade Displays**

9:00 am – 9:10 am   **Welcome and Housekeeping** – The Shed

9:10 am – 10.15 am   **Plenary 1** – The Shed

- **Ms Michelle Kueh**

10.15 am – 10.45 am   The Shed – **Credit Union SA, Education Perfect** - Sponsors

10.45 am – 11:30 am   **Morning Tea** – The Shed - **visit Trade Displays**

11:30 am – 12.30 am   **Workshop 1** – G & E Block / Mathematics & English Department

12:30 pm – 1:30 pm   **Lunch** – The Shed - **visit Trade Displays**

1:30 pm – 2:30 pm   **Workshop 2** – G & E Block / Mathematics & English Department

2:40 pm – 3:40 pm   **Workshop 3** – G & E Block / Mathematics & English Department

Day 2 Friday, 28th April 2017

8:30 am – 9:00 am   **Registration** – tea and coffee available / **visit Trade Displays**

9:00 am – 9:10 am   **Welcome and Housekeeping** - The Shed

9.10 am – 10.20 am   **Plenary 2** – The Shed

– **Dr Amie Albrecht**

10.20 am – 10:45 am   The Shed – **Mathspace** – Sponsor **& MASA/DECD Enrichment Project**

10.45 am– 11-30am   **Morning tea** – The Shed - **visit Trade Displays**

11:30 am – 12:30 pm   **Workshop 4** – G & E Block / Mathematics & English Department

12:30 pm – 1:30 pm   **Lunch** – The Shed - **visit Trade Displays**

1:30 pm – 2:30 pm   **Workshop 5** – G & E Block / Mathematics & English Department

2:40 pm – 3:40 pm   **Workshop 6** – G & E Block / Mathematics & English Department

3:45 pm – 4:45 pm   **"Happy Hour" Sponsored by Education Perfect**
– Staffroom - **Raffle / Prize draws**

Plenary 1: Thursday 27th April

Ms Michelle Kueh

A Brain Based Approach to Maths Learning: Thinking Fast, then Thinking Slow

Bio:

Michelle combines her training in Biomedical Science (Physiology and Pharmacology) with her work in education with McGraw-Hill, Pearson and now Mangahigh, along with her enthusiasm in neuroscience, to present a brain-based-learning approach for teachers to successfully bring into classrooms, to immediately effect change in students. Michelle has also presented on the topic of Games Based Learning in Edutech 2015 in Brisbane, and The Asia Education Show in 2014 in Kuala Lumpur, Malaysia.

Abstract:

As seasoned maths teachers, if you were asked the question "what is 6 times 8" you would provide the answer quickly without any hesitation or effortful deliberation – you instinctively answer 48! In fact, if asked to recite the entire 6 times tables: 6 x 1 = 6, 6 x 2 = 12… all the way to 6 x 12 = 72, or even 6 x 13 = 78 – you could do this quite systematically and effortlessly!

Then, if you were asked to recite the 6 times tables – this time, backwards – you may find this task just slightly more uncomfortable. You may experience increase in heart rate, you may even need to focus a little harder; overall the task would take a little bit more effort. However, if you feel a brief pause or a moment of being 'stuck', you may find, within yourself, an unspoken intuition, a *gut feel* if you wish, that ultimately takes you to the correct solution.

How was this intuition developed? Why is intuition important? Specifically, in maths, why is numerical intuition necessary? How does our brain use this intuition to learn more complex tasks, leading to deeper understanding, reasoning and problem solving?

In her keynote address, Michelle provide insights into the neuroscience of learning, and importantly, what this means in developing our maths lessons.

The striatum is the part of our forebrain that is responsible for implicit learning (memorising). Developing mathematical fluency requires the activation of the striatum – which critically relies on dopaminergic inputs. What are the features of a maths activity that would stimulate this part of our forebrain, effectively? Once we have such insights, we can strategically train our students to *effortlessly* recall answers; which forms a necessary foundation to deeper and more meaningful learning, including problem solving.

The medial temporal lobe supports explicit learning (deeper learning). This process is slower paced and requires *effortful* use of our brain. Developing mathematical understanding requires the activation of the medial temporal lobe – which is critical for long-term memory. Overall, holistic maths learning requires us to pay attention to both implicit (fast) and explicit (slow) learning. Indeed, to achieve deep learning, we rely heavily on the effectively developed fluency. After all, typical 13-year-old students should not burden their medial temporal lobe on working out the answer to "what is 6 times 8" but applying the intuitive answer to deeper, more meaningful maths problems.

Plenary 2: Friday 28th April

Dr Amie Albrecht

Developing mathematical thinking for 'real world' and 'real work' problems

Bio:

Dr Amie Albrecht, Senior Lecturer, School of Information Technology and Mathematical Sciences, University of South Australia

Dr Amie Albrecht is a mathematician and senior lecturer at the University of South Australia. The underlying theme that connects Amie's research, teaching and engagement is 'mathematics in action'. Her research largely focuses on solving practical industry-inspired challenges, leading to more efficient and sustainable transport.

Amie is a high-quality teacher who is particularly interested in developing mathematical thinking and problem-solving skills. She aims to inspire and equip pre- and in-service teachers to incorporate authentic mathematical practice in their classrooms, by orienting them towards the creative, active and collaborative ways in which professional mathematicians work.

An enthusiastic science communicator, Amie is regularly invited to work with students, teachers and the broader community through presentations, workshops and activities. She has served as Vice-President and Treasurer of the Mathematical Association of South Australia (MASA), and currently sits on the national mathematics education committees of the Australian Mathematical Society (AustMS) and the Australian Mathematical Sciences Institute (AMSI).

Abstract:

It is widely acknowledged that our students need more than technical proficiency for further study and work. These broader capabilities include: critical thinking, creativity, collaboration and communication (including interpersonal skills) — known as the 'Four Cs' — along with formulating problems, devising and implementing solution approaches, and assessing the quality of different solutions. How do we develop these skills in a mathematical setting?

For both professional and learner mathematicians, these skills are most often used and developed when solving 'real world' problems. But there are also stimulating problems from the 'fake world' which require 'real work'. I'll draw here on my experiences teaching a course designed to build mathematical thinking and problem-solving skills in pre-service teachers through games and puzzles.

DAY 1 Thursday 27th April, 2017

8:30 am – 9:00 am   **Registration** – tea and coffee available - **visit Trade Displays**

9:00 am – 9:10 am   **Welcome and Housekeeping** – The Shed

9:10 am – 10.15 am   **Plenary 1** – **Ms Michelle Kueh**

10.15 am – 10.45 am   **Credit Union SA, Education Perfect** - Sponsors

10.45 am – 11:30 am   **Morning Tea** – The Shed - **visit Trade Displays**

11:30 am – 12:30 pm Workshop 1 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
1.1	**Barry Kissane** / Murdoch University Closer and closer – learning about limits with a graphics calculator	11 - 12	G1
1.2	**Helen Haralambous** / MAV and **Tom Frossinakis** / Birdwood High School MASA/DECD Junior Secondary Enrichment Project	7 - 10	G5
1.3	**Andrew Lorimer** / ThinkSquare Engaging games to build skills, confidence and higher order thinking	2 - 10	G6
1.4	**Immanuel Selvaraj /** Tutorsteps / Thomas More College Embedding a structured revision & intervention program in your school	R - 12	G2
1.5	**Alyssa Rigney & Richard Kemp /** Pimpala Primary School Building Learner Disposition – 7 Changes to shift student mindsets	General	G4
1.6	**Peter Fox /** Texas Instruments 101 Problems with coding	8 - 12	G3
1.7	**John Rowe /** Wirreanda Secondary School Desmos Extravaganza – Teaching maths is better with Desmos	8 - 12	E1
1.8	**Constantin Naum /** Woodville High School Looking at inverse functions	11 - 12	E2

12:30 pm – 1:30 pm – Lunch – The Shed

1:30 pm – 2:30 pm Workshop 2 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
2.1	**Deb Woodard-Knight /** St John's Grammar School Stage 2 Specialist Maths	12	E2
2.2*Double Session	**Ann Ruckert /** AAMT Part 1 Primary – Investigating Fractions through the Dimensions Portal	R - 7	G2
2.3	**Peter Sawley /** Energy Education Australia Making a rat-trap car for the MASA competition Car Race	7 - 10	G1
2.4	**David Butler /** Adelaide University The Queen of Hearts Plays Noughts and Crosses	General	G4
2.5	**Marion Gaertner /** Finance IQ / MASA Mathematics in the Flat Earth Theory	6 - 10	G5
2.6	**Damian Almeida /** Cengage / Maths Pathway Maths Pathway, a new, data-empowered approach to teaching and assessing mathematics	7 - 10	G3
2.7	**Matt Skoss /** AAMT reSolve: Maths by Inquiry – An update on the project	F - 10	G6
2.8	**Nick Kyriaszis /** LeFevre High School Interactive Beginnings	7 - 10	E1

2:40 pm - 3:40 pm Workshop 3 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
3.1	**Marion Gaertner /** Finance IQ / MASA Investigating Financial Models in Essential and General Mathematics	11 - 12	G5
3.2*Double Session	**Ann Ruckert /** AAMT Part 2 Primary – Professional Learning for PL Presenters. Those interested in participating in this workshop are asked to register their interest via: http://tiny.cc/elli-eoi by Monday 24 April.	R - 7	G2
3.3	**Sam Capurso /** Wilderness School Fostering a culture of mathematical thinking	7 - 12	G4
3.4	**Michelle Kueh /** Manga High Mangahigh – engaging 21st Century Learners	F - 10	G6
3.5	**Peter Fox /** Texas Instruments Focus on steM	8 - 12	G3
3.6	**Barry Kissane /** Murdoch University Take five: Examples of learning with a calculator in years 7-9	7 - 9	G1
3.7	**Alastair Lupton /** LeFevre High School From little square, big quadratics grow	8 - 12	E1
3.8	**Lloyd Stagg /** aussiemathstutor.com.au Programming and drawing with a TI-84 graphics calculator	9 - 12	E2

DAY 2 Friday 28th April, 2017

8:30 am – 9:00 am	**Registration** – tea and coffee available - **visit Trade Displays**
9:00 am – 9:10 am	**Welcome and Housekeeping** – The Shed
9.10 am – 10.20 am	**Plenary 2** – **Dr Amie Albrecht**
10.20 am – 10:45 am	The Shed – **Mathspace** – Sponsor **& MASA/DECD Enrichment Project**
10.45am – 11.30 am	**Morning tea** – The Shed - **visit Trade Displays**

11:30 am – 12:30 pm Workshop 4 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
4.1	**Brian Lannen /** Wodonga Institute of TAFE Great Expectations - Continuous Probability Distributions	11 - 12	G3
4.2	**David Shigrov /** St Peters College Improving student's mental arithmetic through game based competition	3 - 8	G1
4.3	**Clare Freeney /** Education Perfect Taking the Textbook Online with Education Perfect	7 - 10	G2
4.4	**Megan Blanch /** Mathspace Personalised learning using Mathspace	3 - 12	G5
4.5	**David Butler /** Adelaide University Scattered Plots: How statisticians think about data using graphs	General	G4
4.6	**Pauline Carter /** DECD Duelling Divas with Diabolic Dice	8 - 12	G6
4.7	**John Rowe /** Wirreanda Secondary School Problem based learning in maths	General	E1
4.8	**Nadia Abdelal** CHOOSEMATHS Outreach Officer, Australian Mathematical Sciences Institute (AMSI) - CHOOSEMATHS	General	E2

12:30 pm – 1:30 pm – Lunch – The Shed

1:30 pm – 2:30 pm – Workshop 5 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
5.1	**Deb Woodard-Knight /** St John's Grammar School Stage 1 Methods and Specialist Teaching Tips	11	E2
5.2	**Maryanne Rischmueller /** Two wells Primary School The What, How and Why of Trusting the Count	R - 7	E1
5.3	**Brian Lannen** / Wodonga Institute of TAFE Proof by Induction – It works now, but what about next time?	11 - 12	G3
5.4	**Amie Albrecht /** UniSA All Tangled Up	7 - 12	G4
5.5*Double Session	**Ann Ruckert /** AAMT Part 1 Secondary - Geometric Reasoning	7 - 10	G2
5.6*Double session	**Anthony Harradine /** Prince Alfred College Part 1 – A cure for fraction angst? (Please bring own device for this workshop)	3 - 7	G5
5.7	**Andrew Spitty /** Essential Assessment Essential Assessment - Assessment and Curriculum Made Easy	F - 10	G6
5.8	**Barry Kissane /** Murdoch University The joy of random sampling	11 - 12	G1

2:40 pm – 3:40 pm Workshop 6 – G & E Block / Mathematics & English Department

Session	Presenter and title	Yr levels	Room
6.1	**David Butler /** Adelaide University One Hundred Factorial: Playful and Joyful Maths	General	G4
6.2	**Jo Kellaway** / ASMS Non-traditional SATs using DESMOS	6 - 12	E1
6.3	**Patricia Curtis /** Seaton High School Manufacturing Moguls, STEAM or just hot air?	8 - 9	E2
6.4	**David Andrew /** MASA Mathematical Modelling – solve real world problems	8 - 11	G1
6.5*Double Session	**Ann Ruckert /** AAMT Part 2 Secondary – Professional Learning for PL Presenters	7 - 10	G2
6.6*Double session	**Anthony Harradine /** Prince Alfred College Part 2 – A cure for fraction angst?	3 - 7	G5
6.7	**Andrew Lorimer** / ThinkSquare Using games to develop mathematical vocabulary	2 – 10	G6
6.8	**Kelvin Ching** / Sacred Heart College Microsoft Equation Editor and OneNote	General	G3

3:45 pm – 4:45 pm – "Happy Hour" / Sponsored by Education Perfect
Raffle / Prize draws – Staffroom
(Fill in your **evaluation form** (provided in your satchel) to win a prize
– enter into box in Staffroom!)

NAME and ABSTRACT	Workshop	Years
ABDELAL Nadia – AMSI CHOOSEMATHS Outreach Officer, Australian Mathematical Sciences Institute (AMSI) The basis for confidence in mathematics varies across the student and teacher cohort, with many reporting a range of degrees of comfort with their own mathematical abilities. Through the CHOOSEMATHS Project, we have found some interesting connections in our preliminary data. In our Outreach work in schools across Australia, we use Growth Mindset strategies to work with students and teachers to enhance their teaching and learning of mathematics. In this session we will outline some of the strategies that have been useful. CHOOSEMATHS is a national project aimed at getting more girls and young women into mathematics through targeted teacher professional development, careers awareness and mentoring and support across the mathematics pipeline.	**4.8**	**General**
ALBRECHT Amie – University of South Australia All Tangled Up We'll tangle up two ropes using only two kinds of moves: twist and rotate. Is it possible to untangle the ropes using only these moves? This workshop will focus on the rich problem called 'Conway's Rotational Tangles', with surprising mathematical connections. Resist the urge to Google it, and come and discover for yourself. This is a hands-on problem-solving workshop full of doing maths. Be prepared for lots of tangles, both physically and mentally!	**5.4**	**7 - 12**
ALMEDIA Damian – Cengage / Maths Pathway Maths Pathway, a new, data-empowered approach to teaching and assessing mathematics Maths Pathway replaces the old "one-size-fits-all" approach to maths with a teacher-supported system of individualised learning. Through Maths Pathway, each student is tested on their individual mathematics understanding and given lessons according to their specific needs. By allowing students to work at their own pace, nobody is left behind and anyone can accelerate ahead.	**2.6**	**7 -10**
ANDREW David – MASA Mathematical Modelling - solve real world problems Modelling the real world to solve problems is an important aspect of the Australian Curriculum problem solving proficiency and is used extensively to assist in understanding our world. This workshop will look at several mathematical models designed to help students apply their mathematical knowledge to solve real-world problems.	**6.4**	**8 - 11**
BLANCH Megan – Mathspace Personalised learning using Mathspace As teachers, we know that learning could be so much more successful if we could truly tailor and differentiate what we do in the classroom - but who has the time? In this workshop see how Mathspace can be used to create a learning environment for students that enables them to learn mathematics at their own pace, step by step with feedback and scaffolding to support their development of mathematical reasoning. With extensive data capture and reporting, Mathspace allows teachers to target their teaching, increasing one-to-one teacher-student time, catering for individual differences and achieving overall improved student outcomes.	**4.4**	**3 - 12**
BUTLER David – The University of Adelaide The Queen of Hearts Plays Noughts and Crosses In this session, we'll explore the fascinating world of finite geometry through the medium of noughts and crosses and a deck of cards. The ideas here would be useful for extension of students at many different year levels and levels of maths skill.	**2.4**	**General**
BUTLER David – The University of Adelaide Scattered Plots: How statisticians think about data using graphs In this session, we'll explore how statisticians think about data using graphs which are all variations on the scatterplot. We will create our own graphs in small groups using physical manipulatives.	**4.5**	**General**

BUTLER David – The University of Adelaide One Hundred Factorial: Playful and Joyful Maths In this session, we'll explore what it means and what it feels like to engage in joyful play in maths, and how to encourage the atmosphere that allows for it. I'll describe what I have learned at the puzzle and games group "One Hundred Factorial" over the last ten years, and give participants a chance to experience a bit of what I do there for themselves. Come prepared to play with some puzzles together.	**6.1**	**General**
CAPURSO Sam – Wilderness School Fostering a culture of mathematical thinking This workshop will explore building a culture of mathematical thinking with the use of inclusive language, effective questioning and teaching strategies that challenge misconceptions, foster student participation and develop understanding.	**3.3**	**7 - 12**
CARTER Pauline – DECD Duelling Divas with Diabolic Dice This session explores the outcomes of a set of dice which have non-transitive properties. We will have some virtual battles between female super heroes and their side-kicks to determine ultimate supremacy and visit some simple probability concepts along the way.	**4.6**	**8 - 12**
CHING Kelvin – Sacred Heart College Sacred Heart College Microsoft Equation Editor has been introduced since the launch of Office 2007. It makes touch-typing mathematics in Office a dream come true. OneNote has been a unique product in Office. After seeing an interstate presenter showing how it organises teaching materials systematically back in AAMT at Fremantle, I tried it when I got back, and have been using it ever since. In this workshop, you will have hands-on activities to learn how to touch-type mathematics in Office. Also, I'll show how I use OneNote in my teaching and how to setup a Class Notebook with your own class. Note: Please BYO notebook. If you don't have Office in your notebook, you can use your school email to register an account at Office Online (search "Office in Education") and install Office in your notebook for FREE.	**6.8**	**General**
CURTIS Patricia – Seaton High School Manufacturing Moguls, STEAM or just hot air? Brief Presenter background: Teaches Physics & Maths to Y12 in addition to Y9 Maths & Science to the SHIP class. Patricia has previously worked at UniSA as a tutor & demonstrator for physics. She is always looking for opportunities to incorporate Critical Analytical Thinking (CAT) and Algorithmic processes into the classroom environment, both of which underpin STEM & STEAM.	**6.3**	**8 - 9**
FEENEY Clare – Education Perfect Taking the Textbook Online with Education Perfect Are you looking to take advantage of the latest in technological advancements, while ensuring that your students' learning needs are addressed and your pedagogy remains effective? Education Perfect is designed as a replacement for the traditional textbook and presents a flipped classroom, allowing your students to gain an understanding of topics through rich images and video. World-class reporting gives you meaningful insights into students' learning journeys and the latest in Direct Integration with LMS, live monitoring, and customisable content (aligned with the Australian Curriculum) is incorporated into this intuitive platform. Come along to this session to learn more about how you can implement Education Perfect in your classroom and make the most of this exciting and engaging program today!	**4.3**	**7 -10**
FOX Peter – Texas Instruments Focus on STEM STEM principles: observe, design, construct and test are relevant to all subjects regardless of their inclusion in the acronym. They serve as a reminder to us all that to remain relevant we may need to refocus our thinking and in some cases, introduce IT. Participants in this workshop will explore a relatively simple problem and use technology, including the TI-Innovator as a part of the solution process.	**3.5**	**8 - 12**

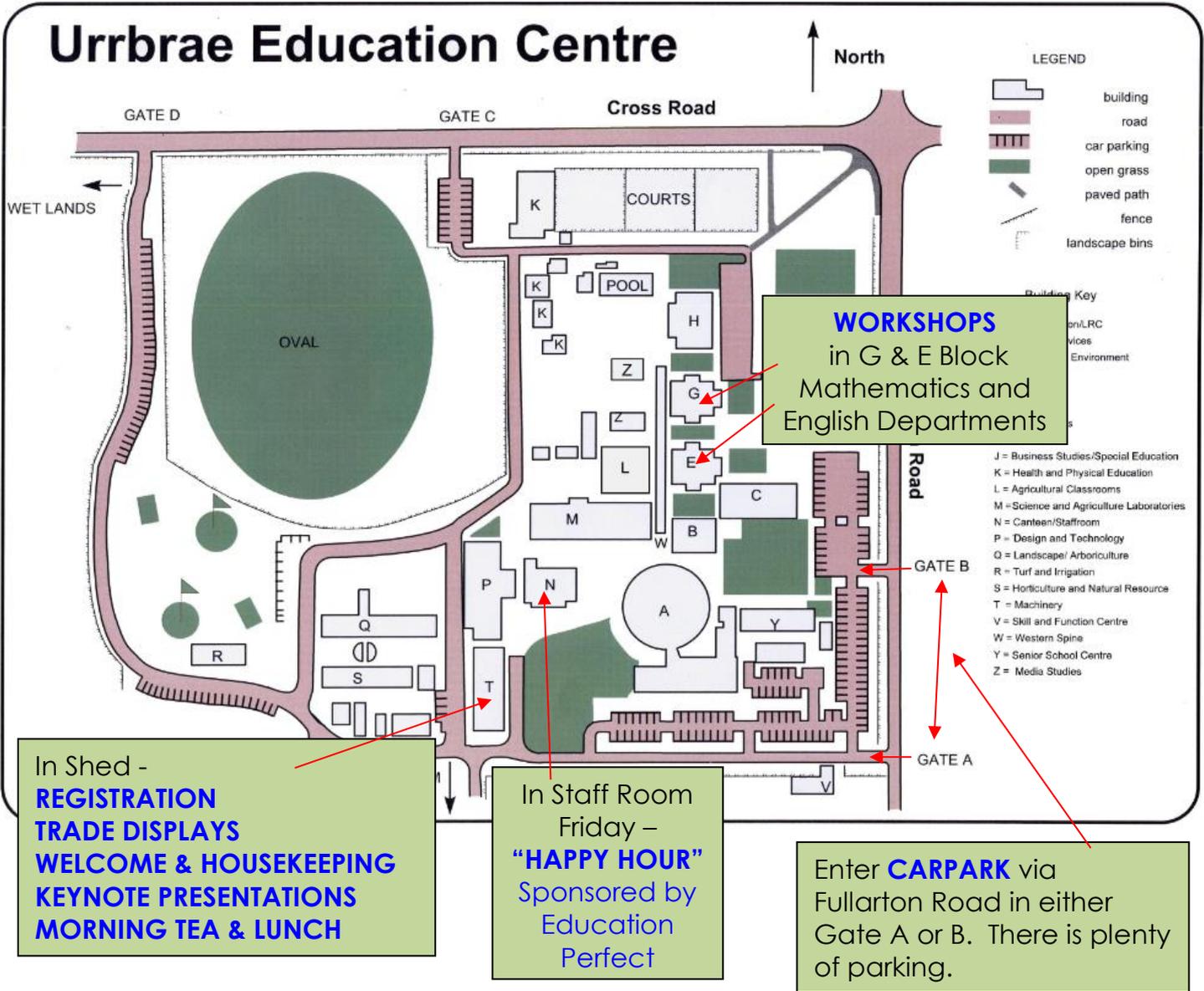|		
FOX Peter – Texas Instruments 101 Problems with Coding What is so special about 739397? Can you find any other numbers like it? There are so many amazing investigations in mathematics that can be supported with some basic coding. In this workshop participants will be able to explore a selection of great mathematics problems and see how coding can be just as integral in the solution process as algebra.	**1.6**	**8 - 12**
FROSSINAKIS Tom - (Birdwood High School) & Helen HARALAMBOUS – (MAV) **MASA/DECD Junior Secondary Mathematics Enrichment Project** MASA in conjunction with DECD is offering students in Years 8-10 the opportunity to be involved in the Junior Secondary Mathematics Enrichment Project. Students either individually, in groups (up to five students) or as a class investigate an area of mathematics and present their findings as a project. The best of these can be submitted to MASA for judging at Years 8, 9 and 10, with cash prizes awarded for the best projects. Helen Haralambous will discuss the equivalent competition the MAV run in Victoria and provide examples of successful projects at the state and national level.	**1.2**	**7 - 10**
GAERTNER Marion – Finance IQ Investigating Financial Models in Essential and General mathematics This workshop will look at how savings strategies, short and long term, can be approached via the myriad of products offered by financial institutions. Conversely this applies to borrowing money. The structure of lending products will determine how quickly the borrower will be able to repay a loan and how much interest can be saved. We will look at budgeting, saving schemes, loan options and products available to provide income streams at retirement or earlier.	**3.1**	**11 - 12**
GAERTNER Marion – Finance IQ Mathematics in the Flat Earth Theory The Flat Earth Theory has been part of Man's thinking since ancient times and deserves exploration via the school curriculum. There is a large amount of information available which students can investigate and test, and then form their opinions as to whether the mathematics, science and technology applied is indeed valid.	**2.5**	**6 - 10**
HARALAMBOUS Helen – (MAV) & Tom FROSSINAKIS – (Birdwood High School) MASA/DECD Junior Secondary Mathematics Enrichment Project MASA in conjunction with DECD is offering students in Years 8-10 the opportunity to be involved in the Junior Secondary Mathematics Enrichment Project. Students either individually, in groups (up to five students) or as a class investigate an area of mathematics and present their findings as a project. The best of these can be submitted to MASA for judging at Years 8, 9 and 10, with **cash prizes** awarded for the best projects. Helen Haralambous from MAV will provide teachers with valuable information about a similar competition (Mathematics Talent Quest MTQ) organised in Victoria, allowing teachers to gain a better understanding of the Enrichment Project and how schools can be involved. The MTQ has many supporting resources including a guiding rubric to assist teachers to facilitate the investigative process. These supporting resources will be shared. The MTQ marking rubric and judging process will be explained, with examples of past successful projects, at the state and national level, presented.	**1.2**	**7 - 10**
HARRADINE Anthony – Prince Alfred College A cure for fraction-angst? (Please bring own device for this workshop) a) If asked how you think about the fraction three-quarters, what is your answer? Do you have more than one way to think about three-quarters? b) If asked how you think about three-quarters multiplied by eight-elevenths, what is your answer? Do you have more than one way to think about three-quarters multiplied by eight-elevenths? c) If asked how you would calculate three-quarters multiplied by eight-elevenths, what is your answer? Were your answers to b) and c) different? It turns out there are a number of ways of thinking about fractions, all good, but one better than the others when it comes to moving one's think past the trivial starting points that young minds first meet. Come along and hear about a flow of ideas that can be developed with students that has the potential to change, dramatically, a student's success with fractions at school. The flow of ideas has been developed into a set of uncomplicated, but engaging activities for students. (Suitable for teachers of anyone who is learning about fractions.)	**DOUBLE SESSION 5.6 & 6.6**	**3 - 7**

KELLAWAY Jo – Australian Science and Mathematics School Non-traditional SATs using DESMOS DESMOS is a free online graphing program that lets student explore aspects of algebraic geometry. It can also be used to set up tasks that students log on to to complete assignments. This workshop will look at how to create these tasks as well as a discussion about the pros and cons that we found at the ASMS.	**6.2**	**6 - 12**
KEMP Richard & Alyssa RIGNEY – Pimpala Primary School – DECD Building Learner Disposition – 7 Changes to shift student mindsets Join Alyssa Rigney and Richard Kemp as they share their journey towards building a positive learner disposition in Mathematics. They will share 7 deliberate changes that they have made in their classroom practice, moving on from 'Growth Mindset talk' to students accepting challenges and owning their own learning.	**1.5**	**General**
KISSANE Barry – Murdoch University WA Take five: Examples of learning with a calculator in years 7-9 A calculator is a learning tool, not merely a computational tool. To explore this underappreciated claim, we will take five topics from the Year 7-9 curriculum, and consider in this hands-on workshop how students might benefit from learning them with a calculator: fractions, index laws, variables, trigonometry and probability.	**3.6**	**7 - 9**
KISSANE Barry – Murdoch University WA The joy of random sampling Random sampling underpins statistical inference, as clearly highlighted in Topic 5 and 6 of Mathematical Methods Stage 2. In this hands-on workshop, we will explore some of the ways in which a graphics calculator might be used to emphasise the meanings involved and experience something of the joy of seeing the predictable patterns in randomness.	**5.8**	**11 -12**
KISSANE Barry – Murdoch University WA Closer and closer: Learning about limits with a graphics calculator Developing intuitions about the notion of getting 'closer and closer' has always been a key purpose of teaching students about limits, even if the treatment is relatively informal. A graphics calculator offers a variety of ways of developing meaning for the difficult ideas involved. In this hands-on workshop, we will explore some of the ways in which a graphics calculator might be used to emphasise the meanings involved.	**1.1**	**11 - 12**
KUEH Michelle – Mangahigh.com Mangahigh – engaging 21st Century Learners Mangahigh is a multi-device Maths Resource that utilizes games-based learning to engage 21st century learners globally. Mangahigh enhances classrooms with fun and excitement as student's complete activities to build and consolidate their Maths knowledge. Mangahigh's adaptive content caters to students of all ability levels and give teachers the tools to differentiate their lessons seamlessly. All games and lessons are curriculum aligned, and by using a blended approach of digital and traditional teaching methods Mangahigh prepares students for the challenges of the future.	**3.4**	**F - 10**
KYRIASZIS Nick – Le Fevre High School Interactive Beginnings Using an interactive task to introduce topics seems to offer many benefits in a middle school mathematics classroom, but actually doing it is sometimes harder than it seems. Selecting the right task for the right group of students is key. I will share two of these tasks that will hopefully kick-start your students' thinking in algebra and sampling.	**2.8**	**7 - 10**
LANNEN Brian – Wodonga Institute of TAFE Proof by Induction – It works now, but what about next time? Conjectures such as finding a formula for the sum of the first n integers can be proven in a multitude of ways. Let us use this to illustrate inductive proof; that is commencing with an (easily demonstrated) initial statement and then generalising by way of an inductive step. Participants will revisit some familiar number patterns in order to practice the method of proof by induction.	**5.3**	**11 - 12**

LANNEN Brian – Wodonga Institute of TAFE Great Expectations - Continuous Probability Distributions When considering teaching & learning strategies for Continuous Random Variables and Normal Distributions, the Maths Methods students' love of integral calculus is the pathway to help them understand the prob/stats side of things. Dynamic visuals from graphing software combined with various statistics 'wizards' can help demystify this topic by constructing cognitive links to prior learning.	**4.1**	**11 - 12**
LORIMER-DERHAM Andrew – St Mary's Primary School VIC (Think Square) Engaging games to build skills, confidence and higher order thinking Calculating the area of rectangle, triangles and compound shapes, Developing mathematical vocabulary (Odd, Even, Prime, Factors, Multiples…) Location and Transformation (Rotation, reflection, translation) Multiplication Tables + working backward using division addition and subtraction strategies Fractions (Adding, comparing, developing language) Probably and Data collection. Number & Algebra, Measurement & Geometry, Stats and Probability	**1.3**	**2 - 10**
LORIMER-DERHAM Andrew – St Mary's Primary School VIC (Think Square) Using games to develop mathematical vocabulary Imagine being taught in a language you barely comprehend. For many students that's what learning maths feels like. Mathematical vocabulary can be a great asset or a huge barrier to student learning. In this workshop you will be shown a range of games that value and develop mathematical language. Vocabulary is best developed through natural repetition and a meaningful context, both of which games can provide.	**6.7**	**2 - 10**
LUPTON Alastair – Le Fevre High School From a little square, big quadratics grow A humble square of paper leads us to wonder, then to reason; and then to see the power of quadratic algebra in order to be sure - beyond all doubt. This introduction to quadratic functions comes with a unit that tackles this time-honoured mathematics in some new ways, and has been taken to new heights with a video-based introduction that you can watch, think about and share with your class. A little handheld technology is used to great effect in this unit, but none is assumed for the workshop.	**3.7**	**8 - 12**
NAUM Constantin – Woodville High School Inverse functions A presentation/discussion on inverse functions in relation to their domain/range. Particular emphasis on the inverse of trigonomic functions defined on various domains. Applications of inverse functions and differentiation/integration techniques in proving identities.	**1.8**	**11 - 12**
RIGNEY Alyssa & Richard KEMP – Pimpala Primary School Building Learner Disposition – 7 Changes to shift student mindsets Join Alyssa Rigney and Richard Kemp as they share their journey towards building a positive learner disposition in Mathematics. They will share 7 deliberate changes that they have made in their classroom practice, moving on from 'Growth Mindset talk' to students accepting challenges and owning their own learning.	**1.5**	**General**
RISCHMUELLER Maryanne – Two Wells Primary School The What, How and Why of Trusting the Count Trusting the count is the first Big Idea in Numbers (Prof Di Siemon). This is a hands-on workshop exploring: - the development sequence of the concept - embedding concepts in enquiry-based learning - how to know when students are ready for Place Values.	**5.2**	**R - 7**

ROWE John – Wirreanda Secondary School Desmos Extravaganza (teaching maths is better with Desmos) If you haven't used Desmos before, stop reading this and sign up for this workshop. Desmos is a free online graphing calculator with so much more than your standard graphing tool. Desmos Classroom Activities are interactive, easy to use and create, to turn up the inquiry dial of your lessons and overcome the usual hurdles of graphing and the cartesian plane. The online tool is continually developing to meet the needs of maths teachers. Come and see the online task that was used as a Stage 1 SAT last year!	**1.7**	**8 - 12**
ROWE John – Wirreanda Secondary School Problem Based Learning in Maths This workshop is aimed at teachers looking to develop an understanding of what Problem Based Learning can look like in the classroom. The session will involve a 3-Act Maths Task, Productive Struggle, and developing Problem Based Learning tasks. Participants of this session will get the opportunity to experience learning through a problem and teacher moves to facilitate an inquiry based approach to teaching and learning.	**4.7**	**General**
RUCKERT Ann – AAMT Investigating Fractions through the Dimensions Portal – Part 1 Primary A conceptual understanding of fractions is essential for problem solving, proportional reasoning, probability and algebra. In this session, participants will be introduced to a series of high quality professional learning modules on fractions that will be available through the Dimensions Portal on the AAMT website. Although the materials are designed to be used by school-based leaders working with teams of teachers, this session will be relevant for any teacher who teaches fractions. The presentation will provide opportunities for teachers to discuss issues, apply new approaches in the classroom and reflect on their experiences.	**2.2** **DOUBLE SESSION**	**R - 7**
RUCKERT Ann – AAMT Professional Learning for PL Presenters – Part 2 Primary This workshop complements the Investigating Fractions through the Dimensions Portal workshop and is designed primarily for those mathematics leaders who have expressed interest in The Engaging Local Leaders Initiative (ELLI). It draws on an early draft of a module designed to support in-school leaders to use the Dimensions materials effectively, including practical advice about how to read and use the Facilitator's Guide. Those interested in participating in this workshop are asked to register their interest via: http://tiny.cc/elli-eoi by Monday 24 April.	**3.2** **DOUBLE SESSION**	**1 - 7**
RUCKERT Ann – AAMT Investigating Geometric Reasoning through the Dimensions Portal – Part 1 Geometric reasoning is the use of critical thinking, logical argument and spatial reasoning to solve problems and find new relationships. In this session, participants will be introduced to a series of high quality professional learning modules on geometric reasoning that will be available through the Dimensions Portal on the AAMT website. Although the materials are designed to be used by school-based leaders working with teams of teachers, this session will be relevant for any teacher who teaches geometric reasoning. The presentation will provide opportunities for teachers to discuss issues, apply new approaches in the classroom and reflect on their experiences.	**5.5** **DOUBLE SESSION**	**7 – 10**
RUCKERT Ann – AAMT Professional Learning for PL Presenters – workshop 4 – Part 2 This workshop complements the Investigating Geometric Reasoning through the Dimensions Portal workshop and is designed primarily for those mathematics leaders who have expressed interest in The Engaging Local Leaders Initiative (ELLI). It draws on an early draft of a module designed to support in-school leaders to use the Dimensions materials effectively, including practical advice about how to read and use the Facilitator's Guide. Those interested in participating in this workshop are asked to register their interest via: http://tiny.cc/elli-eoi by Monday 24 April.	**6.5** **DOUBLE SESSION**	**7 - 10**

SAWLEY Peter – Energy Education Australia Rat trap car race Learn how to make and race a Rat Trap Car for the MASA Competition	**2.3**	**7 - 10**
SELVARAJ Immanuel – Kinetic Education Embedding Structured Revision & Intervention Program in Your School Presentation of Maths Doctor - importance of identifying knowledge gaps in previous years; presentation of automated structured revision and intervention/remedial program and the challenges of implementation.	**1.4**	**R - 12**
SHIGROV David – St Peters College Improving students' mental arithmetic through game based competition Want to motivate students to improve their tables recall? This workshop will identify a few ways in which game based competition can motivate students to improve their mental recall ability. Quick and easy activities to monitor and improve student outcomes. Some ideas will be shared but please feel free to bring along your ideas that work to share with the group.	**4.2**	**3 - 8**
SKOSS Matt – AAMT reSolve: Maths by Inquiry – An update on the project Explore the rich materials available from the reSolve: Maths by Inquiry Project. Current materials available for Years 5-8, with Foundation to Year 4 and Years 9-10 being developed. The Professional Learning Modules will be of interest to school leaders. Schools with a STEM focus will be interested in the Special Topics, including Mechanical Linkages, Algebra in the Real World, Maths of Motion.	**2.7**	**F - 10**
SPITTY Andrew – Essential Assessment Essential Assessment - Assessment and Curriculum Made Easy Essential Assessment is a whole school consistent approach to assessment and curriculum for schools. Essential Assessment allows schools to assess their students accurately in the Australian Curriculum and provide them with a personalised curriculum, group or class, based on their assessment results for each sub-strand and the requirements of each classroom teacher.	**5.7**	**F - 10**
STAGG Lloyd – aussiemathstutor.com.au Programming and drawing with a TI-84 graphing calculator This hands on workshop will use the T184 programming application to draw a variety of web-like shapes. The programs are straight forward and can be used in secondary mathematics classes with access to T184 calculators.	**3.8**	**9 - 12**
WOODARD-KNIGHT Deb – St John's Grammar School Stage 2 Specialist Mathematics This presentation is for teachers of stage 2 Specialist Mathematics. I will go over techniques and teaching tips, new content	**2.1**	**12**
WOODARD-KNIGHT – St John's Grammar School Stage 1 Methods and Specialist Teaching Tips This presentation is for new teachers to stage 1 Mathematics. I will go over techniques and teaching tips, some calculator tips too. This is not designed for teachers who have been teaching for a while - you'll be bored!	**5.1**	**11**

CONFERENCE MAP

Urrbrae Education Centre

North

LEGEND

building
road
car parking
open grass
paved path
fence
landscape bins

Cross Road

GATE D   GATE C

WET LANDS

OVAL

K   COURTS

POOL

K
K
K

H

Z

G

Z

E

L

C

M

B

W

P

N

A

Y

Q

S

R

T

V

GATE B

GATE A

Building Key

...on/LRC
...vices
...Environment

J = Business Studies/Special Education
K = Health and Physical Education
L = Agricultural Classrooms
M = Science and Agriculture Laboratories
N = Canteen/Staffroom
P = Design and Technology
Q = Landscape/ Arboriculture
R = Turf and Irrigation
S = Horticulture and Natural Resource
T = Machinery
V = Skill and Function Centre
W = Western Spine
Y = Senior School Centre
Z = Media Studies

WORKSHOPS
in G & E Block
Mathematics and
English Departments

In Shed -
REGISTRATION
TRADE DISPLAYS
WELCOME & HOUSEKEEPING
KEYNOTE PRESENTATIONS
MORNING TEA & LUNCH

In Staff Room
Friday –
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And all our participants for their support!