

Workshop 9

Thursday 5th October, 1510

Workshop summary

W9A	Take an open-ended task, add a pinch of imagination and/or a dollop of collaboration....	Sarah Cobb
W9B	We can count on more than Frank: Using picture books to engage students in mathematics	Tracey Muir, Jill Wells, Sharyn Livy
W9C	PAT: Mathematics Adaptive Assessment	Julie Roberts
W9D	Your classroom. Your choice. How to take control and use eLearning tools to suit your teaching style.	Charlene Macrae
W9E	Teaching Coding for Engaging, Rich and Creative learning	Jared Hockly
W9F	A BLAST from the PAST really works!	Margi Leech
W9G	Little Secrets of Statistical Inference	Marina Alexander, Nugzar Nachkebia
W9H	"Senior Maths in a modern learning environment on 2 periods a week"	Murray Hamilton
W9J	Using video in maths classrooms	John Mitchell
W9L	Reciprocal Teaching, Math mindsets and other stuff	John Walker
W9M	Increasing discussion and interaction in mathematics classes.	Nicola Petty
W9N	Regional Math Association Executive Forum	Rachel Passmore

W9A

Take an open-ended task, add a pinch of imagination and/or a dollop of collaboration....

Sarah Cobb

A mathematically worthwhile task is one that has some (or all) of the following elements: it is open-ended, accessible to all, has different entry and exit points, invites risk-taking, decision-making and creativity, encourages conjectures, testing, proving, explaining and interpreting, and may lead in different directions.

This workshop introduces a seemingly straightforward open-ended task (adding consecutive numbers) in order to explore the features of mathematically worthwhile tasks. Participants will investigate ways of solving this problem, possible solutions and the wonderings and conjectures that students may have. The workshop will then focus on how the problem can be extended and expanded, including investigating Gauss's strategy for summing an arithmetic series, and links that can be made to algebra and measurement. Participants will be encouraged to create visual representations of their solutions, which are so important in enabling students to engage with and understand mathematical ideas (and also to emphasize the fact that when mathematicians work, they represent their ideas in many different ways - that is not all about numbers and answers).

Finally, the workshop will discuss ways tasks such as this one can be used to support the development of collaborative practice, whatever the environment teachers are working in.

Jo Boaler describes mathematics excitement as being a combination of 'curiosity, connection making, challenge...creativity and...collaboration' (Mathematical Mindsets). This workshop offers opportunities for participants to experience all these. The workshop is suitable for teachers with students working at Levels 1-4.

Recommended Audience: Year 1 – 6 Teachers, Year 7 – 8 Teachers

Sarah Cobb is a Primary Mathematics and Statistics Facilitator at University of Canterbury, Education Plus. She has many years of successful classroom experience teaching at all levels of the primary school. Sarah is passionate about maths education, particularly supporting teachers and students to see themselves as confident, capable mathematicians who take risks, engage in mathematical discourse, effectively use tools and representations and, most importantly, enjoy maths.

W9B

We can count on more than Frank: Using picture books to engage students in mathematics
Tracey Muir, Jill Wells, Sharyn Livy

Engaging children in mathematics through the use of children's literature has become increasingly popular. The benefits of integrating literature into mathematics lessons include its potential to motivate children, to help them learn mathematical concepts and skills, to provide them with a meaningful context for learning mathematics and to facilitate the development and use of mathematical language and communication.

This workshop will identify many of the reasons for using picture books in the classroom to develop students' mathematical interest and understanding. We will share some of our favourite picture books and demonstrate examples of mathematical concepts and activities that can be developed from the books. Picture books that are not explicitly mathematical in nature are particularly useful for engaging students in stimulating conversation about potential mathematical content, and we will provide a number of examples of these. Participants will be provided with practical suggestions on how to structure mathematical lessons based on children's literature, with a particular focus on the early years. It is anticipated that all participants to leave the workshop with lots of practical ways to incorporate picture books into mathematics.

Recommended Audience: Year 1 – 6 Teachers

Tracey Muir is a Senior Lecturer in Mathematics Education at the University of Tasmania where she works with early childhood and primary pre-service teachers. Her research interests include effective teaching for numeracy, teachers' pedagogical content knowledge, engaging students in mathematics and teachers' use of ICT in the mathematics classroom.

Jill Wells is a Research Fellow at the University of Queensland. Formerly a classroom teacher with a passion for mathematical inquiry, her research interests include children's use of evidence and reasoning in mathematics, student engagement, and inquiry based learning.

Sharyn Livy is a Lecturer at Monash University where she teaches pre-service teacher education courses. She regularly works alongside practicing teachers in their classrooms to enhance their practice and is an experienced provider of professional learning.

All presenters have a particular interest in utilising children's literature to teach mathematical concepts and have recently co-authored 'Engaging with mathematics through picture books'.

W9C

PAT: Mathematics Adaptive Assessment

Julie Roberts

This year NZCER introduced the PAT: Mathematics Adaptive assessment. This new assessment tool is an online computer adaptive version of a PAT: Mathematics test. In a PAT: Mathematics Adaptive test the computer selects the questions for each student based on the responses they have given to previous questions in the test. Differentiated assessment underpins this tool to find a student's best-fit within the NZC. This workshop will explore this new approach with opportunity to explore an assessment and the reports that are generated online.

Key learning points from the workshop include:

- PAT: Mathematics adaptive assessment enables finding where a student is working at within the NZC
- Adaptive online assessments can engage and motivate learners
- Analysing reports will support inquiring into teaching practice

Bring a laptop or tablet to explore the online assessment tool.

Recommended Audience: Year 1 – 6 Teachers, Year 7 – 8 Teachers, Year 9 – 10 Teachers

Julie joined NZCER as an Education Advisor / Researcher in 2017. Julie is an experienced mathematics facilitator and primary teacher. For the last nine years she has worked in a range of capacities delivering mathematics professional learning support in schools and clusters. She has strengths in mentoring and coaching leadership, effective assessment practices, and strategies to accelerate learning outcomes.

W9D

Your classroom. Your choice. How to take control and use eLearning tools to suit your teaching style.

Charlene Macrae

A good eLearning program can no longer just engage students with their maths homework - most of them do that.

The true value of an eLearning program is its enablement of teachers, through accurate reporting and teaching tools, to effectively and accurately use data to drive teaching and learning practices. Whilst also empowering teachers to decide on the balance of teacher-led instruction and student-driven learning that they want for their students and classroom.

During the session we'll look at how Mathletics is empowering teachers to meet the diverse needs (and level of guidance) of their individual students, through teaching tools that enable blended learning. The session will also introduce you to Mathletics' extensive real-time reporting, which can be used to quickly and accurately drive data-driven teaching practices. Whether its overall classroom progress or focusing on an individual student's strengths and weaknesses, you choose the level of data you want to use.

This workshop is presented by one of our **GOLD Sponsors**.

Recommended Audience: Year 1 – 6 Teachers, Year 7 – 8 Teachers, Year 9 – 10 Teachers

Charlene is a Regional Manager at 3P Learning, the company that supports Mathletics, Reading Eggs and Spelloidrome.

She is passionate about the supporting teachers and students to use Mathletics effectively in the classroom to enhance learning.

W9E

Teaching Coding for Engaging, Rich and Creative learning

Jared Hockly

Coding is a tool that is valuable for our students to learn and connect with Maths and Stats. It has the potential to:

create a context for students to want to learn our subject content,
a modern form of teaching problem solving,
and a way for student to be creative with our subject area

We'll look at using Scratch (free online coding developed by MIT) with students. We'll have a good play with a mathematical coding task (Flash enable device required - i.e most phones and tablets will not work). You'll get a good sense of how to code and what a good task can look like.

We will consider how to develop coding ability with our students as they move up the levels, and some other platforms that we can use.

Recommended Audience: Year 9 – 10 Teachers

Jared Hockly is HOD at Western Spring College. Has been involved in finding meaningful ways for Maths and Stats students to learn more deeply with digital technologies. He has presented a range of workshops at Auckland Maths Associations Statistics and Calculus days over the last 4 years. He has fond memories of the last NZAMT conference in Christchurch.

W9F

A BLAST from the PAST really works!

Margi Leech

Place value, fractions, reasoning with strategies - all supported with manipulatives! Explore how to use a variety of structured manipulatives (Cuisenaire, Numicon, Place Value blocks, Pattern blocks, Counting Sticks and Multilink cubes) to help children make connections in maths. You will take away ways of improving student understanding and attainment along with appreciation for evidence and research using manipulatives, an understanding of how to use them, and explore a different approach to use in your classroom.

Recommended Audience: Year 1 – 6 Teachers, Year 7 – 8 Teachers

Margi Leech works for Numicon

W9G

Little Secrets of Statistical Inference

Marina Alexander, Nugzar Nachkebia

If you have been teaching statistical inference at Level 1 and 2 but still have questions or desire to know little bit more than students need; or you would like to learn how to create quality resources for practices and internal assessments yourself; or you would like to see how others are teaching these standards; or have not been teaching these standards but want to give it a go, then this presentation is for you.

We will try to answer questions you may have and unpack some concepts; We will run a practical session - hands on activity to create contexts and data sets for statistical tasks. Also, we will share with you resources for internal assessments. You may find useful to bring your laptop for the practical session. Key points:• Linking informal inference with formal statistical concepts;• Creating resources for AS1.10 and AS2.9 standards;• Useful hints for writing reports and marking schedules;

Recommended Audience: Year 11 – 13 Teachers

Dr Marina Alexander, PHD in Physics and Mathematics. She has been teaching Mathematics at Woodford House since 2005 and has been leading the Mathematics department past 5 years. She has been an external NCEA marker for 9 years.

W9H

"Senior Maths in a modern learning environment on 2 periods a week"

Murray Hamilton

Westmount School is a private school with 15 different sites from Kerikeri to Invercargill. The motto for Westmount is "Learning to learn". Westmount is progressive, moving towards flipped classrooms, self-directed learning, use of technology (devices provided by the school to the students) and a 2 by 2 model for Years 11-13 with Canvas as the student management tool. The 2 by 2 idea is that the students get two periods of teaching a week in the classroom with the Maths teacher and the other two periods they are in the learning centre and students approach the teacher if they require help. For 2017, I get two 50 minute periods with my YR 11 students and one of them is Friday last period! At this workshop I will share the Westmount experience with its successes and pitfalls!

Recommended Audience: Year 11 – 13 Teachers

Murray Hamilton is current Curriculum Leader at Westmount School. He has had over 30 years of teaching experience in NZ schools. His methods of teaching have had to adapt to a modern learning environment to ensure students learn and cover the curriculum on average, less than two 50 minute periods a week.

W9J

Using video in maths classrooms

John Mitchell

I have been using videos and mimio slides in my classroom for about four years. In studying for an MEd I saw video learning is becoming used more in the classroom. This is an introduction to examsolutions an English site with many videos and how I have used them. What are the benefits of using videos in both teaching and learning.

Recommended Audience: Year 9 – 10 Teachers, Year 11 – 13 Teachers

I started teaching in 1998 after completing 22 years in the Royal Air Force. I taught in two schools in the UK and was Head of Maths at a boys grammar school in Kent. In 2009 I immigrated to New Zealand and have taught at two schools in Wellington. Current Assistant HOD at Hutt Valley High School. I was on study leave in 2016, working on a thesis for a Masters of Education.

W9L

Reciprocal Teaching, Math mindsets and other stuff

John Walker

Last year I was awarded a Woolf Fisher Fellowship to enable me to travel to Australia and visit schools. In the July school holidays this year I took up the opportunity to have 5 weeks of R n R along with some school visits.

A highlight for me was the Jo Boaler day at Emmanuel College on the Gold Coast. Mathematical Mindsets is a big focus for the Nayland College maths staff in the way we are slowly shifting our pedagogy. Sharing the gems from this whole day of discovering Mindset Maths will form a large part of my workshop.

In Melbourne I visited Sacred Heart College where they have been working on the Mindsets approach for some time and I will share what works for them in the classroom.

Also in Melbourne I visited Sunshine College who are running a very innovative Mathematics programme based on Reciprocal Teaching. From their website, "Our approach to teaching is to guide students on their individual pathways of learning in a student centred environment".

I am hopeful that what I bring back to Aotearoa will be useful and interesting and applicable to our classrooms.

I am overwhelmingly grateful to the Woolf Fisher Trust for this opportunity.

Recommended Audience: Year 9 – 10 Teachers, Year 11 – 13 Teachers

As a Secondary Mathematics Teacher for nearly 30 years I have been a Head of Learning area at Nayland College in Nelson and Lytton High School in Gisborne. Receiving a Woolf Fisher Fellowship last year was certainly a career highlight and reward for all that time as a struggling teacher.

While I in no way claim to be an expert I hope that what I am able to share will be of use to someone in their attempts to make learning a better experience for their students.

W9M

Increasing discussion and interaction in mathematics classes.

Nicola Petty

This workshop includes an examination of why discussion helps learning, and techniques for encouraging discussion. Traditional mathematics teaching did not involve a great deal of discussion and consequently some teachers find this challenging. In this fun, hands-on workshop we will explore strategies to improve classroom discussion to help learning statistics and mathematics and look at common pitfalls and how to deal with them. We will also share sources of great ideas from the Maths Twitter Blogosphere and from Primary teaching professional development.

Recommended Audience: Year 9 – 10 Teachers, Year 11 – 13 Teachers, Other

Dr Nicola Petty (Dr Nic) is well known for her innovative and engaging approaches to teaching statistics and mathematics. She has spent the past 25 years developing online and physical learning resources for primary, secondary and university students. Nicola is a qualified high school mathematics teacher with additional experience teaching innovative primary school mathematics lessons and running mathematics events. Nicola writes a well-respected statistics learning and teaching blog and keeps current with thinking and research about mathematics education through reading and participating in the MathTwitterBlogosphere. She is co-director of Statistics Learning Centre, a social enterprise with a mission to invent, create and disseminate resources and ideas to enable people to learn and teach mathematics and statistics in a more enjoyable way.

W9N

Regional Math Association Executive Forum

Rachel Passmore

This forum is for the Executive members of the Regional Associations to meet and discuss issues they are currently facing

Recommended Audience: Other

Rachel Passmore is the current AMA President