

Workshop 10
Friday 6th October, 0900

Workshop summary

W10A	Learning to love Maths	Jake Main
W10B	Geometry and Number with a sprinkle of algebra dust!	Derek Smith
W10C	Assessing the thinking curriculum using SOLO	Dave Phillipps
	The Three "C"'s - Collaborating through Cohesive Curriculum	Jill MacDonald
	Piece of Pi - Tackling Maths Anxiety in Young Women	Kerry Newnham
W10D	Data and probability OR probability and data? Using data to teach probability modelling (AS91585)	Anna Fergusson
W10E	"Good" e-learning - what is it, and how do we do it?	Stephen McConnachie
W10F	It's Friday, it must be Carcassonne! - my two favourite games for use in class and out	Jane Gray
W10G	The Perfect Modelling Tool for Teachers and Independent Learners - Workshop 3 (Advanced Uses of Geogebra)	Volker Schroeter
W10H	Engaging year 9 and 10 students at the end of the year in a meaningful way.	Sandra Cathcart
W10I	Learning with Sphero Robots 2	Subash Chandar K
W10K	Learning intentions, Success criteria and Teacher Clarity	Mitchell Howard
W10L	What do we really want with NCEA?	Jan Wallace, NZAMT Exec

W10A

Learning to love Maths

Jake Main

Why are more students disengaged in Maths classes than other subjects? With the proliferation of technology in young people's lives, there is a need for educators to adapt and explore using technology in their teaching. In this presentation, we will explore opportunities to reverse this trend of disengagement using Mangahigh as the vehicle. As a teacher, I have experience using Mangahigh as an online resource to improve student engagement and learning outcomes. Using an online resource effectively empowers teachers and places vital information on their students' progress at their fingertips. I will share with you how teachers can build a growth mindset and encourage resilience in students that leads to on-going success. This is a commercial presentation. This workshop is presented by one of our GOLD Sponsors.

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

Jake Main, QLD & NZ Area Manager

W10B

Geometry and Number with a sprinkle of algebra dust!

Derek Smith

A hands on workshop looking at the structure of geometry via paper folding, visuals, unpacking its language and demands on student learning progressions in CL3-6.

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

Derek is currently on contract to the University of Otago as a Mathematics and Statistics (Central South) Facilitator (Secondary). He has taught mathematics and statistics at secondary schools in the Wellington region for 28 years holding HOD positions and a position as senior lecturer at VUWCE, in Mathematics Education.

W10C.1 (Quickfire)

Assessing the thinking curriculum using SOLO

Dave Phillipps

As Year 9 & 10 teachers, we are required to report to the curriculum level our students are working at, but these are so broad it is hard to clearly identify where students are truly at. Some teachers have developed their own "standards" and have assigned Achieved, Merit & Excellence grades to student work. Others have assigned grades similar to eAstle's Basic, Proficient and Advanced system. But the problem is that the distinction of grades is arbitrarily set. In this quickfire session we will look at how the Lincoln High School Mathematics department has explored marrying curriculum levels and depth of thinking using the SOLO Taxonomy, to provide more meaningful assessment grades for the work completed by our students.

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

Dave Phillipps is currently HOLA Mathematics at Lincoln High School. He has also been a Secondary Mathematics & Numeracy advisor. He strongly believes in the importance of developing students as thinkers and problem solvers within the NZ Curriculum.

W10C.2 (Quickfire)

The Three "C"s - Collaborating through Cohesive Curriculum

Jill MacDonald

As part of setting up the new Hobsonville Point Secondary School, their Learning Design Leaders deconstructed the New Zealand Curriculum. This process led to both the development of a Design Thinking Learning Model and a Conceptual curriculum framework. The team focused upon the concepts and contexts contained within the New Zealand Curriculum taking into account page 16 of the NZC which states:

All learning should make use of the natural connections that exist between learning areas and that link learning areas to the values and key competencies.

The team then looked for the authentic links between these concepts. The most powerful of these connections are the big concepts that frame the Hobsonville Point Secondary School curriculum.

This presentation will explore how our curriculum structure allows for breath and depth - allowing for the potential to go deeper into mathematical ideas for learners paving the way to open/authentic tasks for NCEA Level 1 and the implications for other mathematics departments looking to transform their pedagogy.

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

Jill MacDonald is a Learning Design Leader and Numeracy Coordinator at Hobsonville Point Secondary School - a brand new secondary school that opened at the start of 2014. Jill started teaching in New Zealand in 2010 and has been TiC and Assistant HoD at her previous schools in Auckland. She has worked passionately on integrating mathematics into other learning areas to make authentic connections for her learners.

W10C.3 (Quickfire)

Piece of Pi - Tackling Maths Anxiety in Young Women

Kerry Newnham

As a nation we are missing out on a rich pool of talent for a number of career paths, particularly, but not limited to, those in Science, Technology, Engineering and Mathematics (STEM) due to a condition known as Math(s) Anxiety. It is a specific anxiety which seems to affect females more than males and creates a disproportionate dread of the subject matter, ultimately leading to avoidance and lack of achievement. Because of the cumulative learning process involved in maths, once a student's learning has been impacted by the anxiety it is subsequently very difficult to recover. It can lead to the view "I can't do maths" when the student actually does have the intellectual capability but is being hindered by her emotional reaction. Anxiety impacts the working memory. Cultivating a growth mindset in students is an integral part to addressing this condition, as it takes some focus away getting the right answer which in most cases initiates the anxiety. Putting emphasis into the process of problem-solving at the heart of mathematics develops a deeper connectivity to the subject matter and allows more opportunity for reward and praise. The confidence which comes from this experience encourages the student to persevere which leads to an increased level of achievement.

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

Kerry is an Investment Analyst and former Engineer who has previously tutored undergraduate finance at the University of Otago School of Business. A lifetime lover of maths she was surprised to find the abject horror experienced by some of her students when presented with an unfamiliar problem or even in some cases, a calculator. She researched what she had observed and found it had a name "Math Anxiety". As a result she has developed a programme for high school students to address this issue with the view to ensuring no desired future is out of reach for any student who has the capability to achieve it.

W10D

Data and probability OR probability and data? Using data to teach probability modelling (AS91585)

Anna Fergusson

When teaching probability concepts related to experimental probability, data is often generated using spinners, dice, cards, "balls in urns" or other game-like activities like Pass the pigs. But what about data that has been collected from an ongoing real-world system or process? Can we treat this data the same as data generated by rolling a dice? After a review of the "new" types of questions used to assess AS91585 Apply probability concepts in solving problems, this workshop will focus on the use of a range of types of data to teach probability modelling. We'll look at the different ways we can use probability models, including prediction models, and then have a go using these models to explore real problems. We'll also discuss the possible challenges of teaching both theory-driven probability modelling and data-driven probability modelling alongside each other. You will need to bring a web-enabled device along to the workshop as we will be using online resources/tools as part of the workshop.

Recommended Audience: Year 11 – 13 Teachers

Anna Fergusson teaches intro-level statistics at the University of Auckland. She is interested in statistical education, in particular curriculum and assessment design, and enjoys facilitating workshops to support professional development of statistics teachers. Anna has also worked with the New Zealand Ministry of Education and the New Zealand Qualifications Authority on the development of national assessment standards, tasks and teaching resources for statistics. She also runs a blog for statistics teachers: teaching statistics is awesome

W10E

"Good" e-learning - what is it, and how do we do it?

Stephen McConnachie

What makes a learning activity "authentic"? In particular, what does an authentic digital learning activity look like? The answer to this question has many facets, both subjective and objective. We will explore this concept in Mathematics, unpack some frameworks for evaluating and improving authentic engagement in an e-learning context, and look at some practical strategies for designing your own authentic digital learning activities.

Recommended Audience: Year 7 – 8 Teachers, Year 9 – 10 Teachers, Year 11 – 13 Teachers

Stephen is the e-Learning Coordinator and a Mathematics teacher at Middleton Grange School in Christchurch, specialising in Calculus and Scholarship Calculus. He is the Vice-President of the Canterbury Mathematical Association, and is passionate about equipping teachers in the region to use e-learning effectively. He also loves drinking coffee and playing music.

W10F

It's Friday, it must be Carcassonne! - my two favourite games for use in class and out

Jane Gray

1. A board game I used to lure the top Year 9 boys, to develop a special relationship with a new Calculus class, to check the the mathematical thinking of 'well below' Year 7's..... - Carcassonne
2. A card game for 2, 3 or 4 players that I have adapted for whole class use (max 32 players) - Crib (4 million+ people per week can't be wrong!)

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

Jane is HOD Mathematics at Hillmorton High School

W10G

The Perfect Modelling Tool for Teachers and Independent Learners - Workshop 3 (Advanced Uses of Geogebra)

Volker Schroeter

GeoGebra is a powerful modelling tool for teachers. It enables teachers to model mathematical and statistical problems at all levels of the New Zealand Curriculum. GeoGebra is also suitable as a learning tool for students. It enables curious students to discover properties of mathematical models through interaction with the model.

GeoGebra Challenge - A power user session. In this session participants will develop an interactive teaching tool. Content of this session will be decided by the participants. On the first day of the conference, participants who have enrolled for this session are invited to submit a Maths/Stats problem they wish to explore using GeoGebra.

Participation is best described by "share your experience". Basic knowledge of GeoGebra is required. Bring: a laptop with GeoGebra installed

This is the third workshop in a series of 3 workshops. Delegates are welcome to attend all 3 or individual workshops.

Recommended Audience: Year 7 – 8 Teachers, Year 9 – 10 Teachers, Year 11 – 13 Teachers

Volker Schroeter has 19 years of teaching experience in secondary and tertiary education in New Zealand. He has been using GeoGebra since 2010. Over the past seven years Volker has developed over 800 GeoGebra files, covering all Mathematics strands at all year levels.

This year Volker is using GeoGebra for his inquiry into independent learning.

W10H

Engaging year 9 and 10 students at the end of the year in a meaningful way.

Sandra Cathcart

Those last two or three weeks of the year can be challenging.

In this workshop we will look at some "tried and true" activities to make those last periods of the year worthwhile for you and your students.

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

For the last 5 years Sandra Cathcart has been a Facilitator and National Co-ordinator for Mathematics and Statistics in the Secondary Student Achievement Professional Learning and Development initiative, focused on raising student achievement in secondary schools.

This work focused on change leadership with teachers, middle leaders and senior leaders in a range of schools, involving the facilitation of in-depth professional learning and development centred on teaching and learning. In addition to the work in schools, Sandra has facilitated a number of workshops and clusters, has written a series of national newsletters and a range of online materials and has supported her regional mathematics association.

Sandra is currently a registered facilitator for professional learning and development.

W10I

Learning with Sphero Robots 2

Subash Chandar K

A continuation of Learning with Sphero Robots 1 that ran earlier in the conference.

In this workshop I would like to share some of our success stories and challenges of using these robots. We will be looking at using these robots in the field of Statistics and building homemade chariots. The session will end with a short discussion on strategies and ideas of how you could bring these robots into your classrooms. It is highly recommended that you attend Learning with Sphero Robots 1 to gain further knowledge of these robots. Please have the app (Sphero EDU or SPRK Lightning Lab - available in iOS & Google Play) installed in your smart device for this session

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

Subash Chandar K is the curriculum leader of Mathematics and Statistics at Ormiston Senior College. He is the owner of the YouTube channel infinityplusone for which he was recognized with an Ernest Duncan Award in 2016. He is a regular contributor to the Auckland Mathematics Association events since 2014. He is in constant pursuit of engaging and challenging students at their levels with the use of innovative techniques.

W10K

Learning intentions, Success criteria and Teacher Clarity

Mitchell Howard

When students are provided with clarity they can confidently answer the following questions: Where am I going? How am I doing? And where to next? There was a time when schools were mandating that staff have Learning Intentions and Success Criteria provided for each lesson. How is this sustainable and what should it really look like? Where does this leave the Investigative lessons and rich tasks? Can't there still be a little element of the magical mystery tour? In this workshop we will explore, discuss and develop our thinking in this area and hopefully walk away with some examples to apply to our teaching in Term 4 and beyond.

Recommended Audience: Year 7 – 8 Teachers, Year 9 – 10 Teachers, Year 11 – 13 Teachers

Mitchell has taught Mathematics in NSW, UK, ACT, Victoria and NZ over the past 20 years. He is currently the Head of Mathematics and Statistics St Andrew's College and previously the HOLA at Lincoln High School and Vice President of the Canterbury Mathematics Association (CMA). He has been a regular presenter of workshops at NZAMT conferences (since 2008) and for the CMA. Mitchell was awarded a Jim Campbell award in 2015, has published a Book on SOLO Taxonomy in Mathematics with Pam Hook and contributed a chapter to Robin Averill's Mathematics and Statistics in the Middle Years: Evidence and Practice.

W10L

What do we really want with NCEA?

Jan Wallace, NZAMT Exec

The NCEA will be reviewed in 2018 and the next year the standards are up for review. It is never too early to begin to start thinking about what it is we would like. We can then carry on the discussions in our regions and be prepared when we are asked for our opinion which so often seems to happy when we are all flat out with other things in school. There may be some issues that you would ask NZAMT to get an indication of what the teachers opinions are so as we can respond on behalf of the teachers.

Recommended Audience: Year 11 – 13 Teachers

NZAMT Executive represent the thoughts and feelings of NZ Math Teachers