

Workshop 4

Wednesday 4th October, 1040

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W4A-5A (double session)

Posing investigative questions

Pip Arnold

In this workshop we will explore in-depth the material that Pip developed in her PhD research. This will include activities trialled with students and activities for supporting teacher content knowledge development. Posing investigative questions are fundamental to good statistical investigations. This workshop will be hands-on in Pip's usual fashion.

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

Presenter Bio:

Pip has been involved in mathematics and statistics education for a wee while now. Her current interests besides posing statistical investigative questions include looking at statistics in authentic use in other curriculum areas.

W4B-5B (double session)

Present day BYOD experiences with Year 9 and 10 - Student driven learning

Priscilla Allan

I aim to harness students positive emotions to increase their mathematical engagement & future mathematical success.

The BYOD environment allows students to experience mathematics in an interactive and dynamic way. This year my students each created a New Google Site which they are building throughout the year. It is their portfolio of learning, and evidence of homework. They submitted the site link through Google Classroom, and I have editing rights. Come and see some example student sites, and the sites I find engage students in learning.

<https://sites.google.com/view/2017math> is my site which students use most lessons.

<https://sites.google.com/view/2017math/apn> has notes from my presentations at Pakuranga College. The workshop may include: (subject to change depending on what people want on the day).

- creating your own "New" Google Site
- inserting links, text, images & files into your site
- adding multiple pages to your site
- creating a DESMOS graph and inserting it into your site
- doing some TRANSUM activities and inserting your trophy cabinet link into your site
- looking at sample student sites
- making an animation using DESMOS
- sharing of other sites math teachers are using and loving

A 30 minute presentation will be followed by a 90 minute BYOD workshop.

Recommended Audience: Year 9 – 10 Teachers

Priscilla has taught mathematics for over ten years, gaining her Masters of Professional Studies in 2015. This year she is teaching 2 year 9 classes and 2 year 10 classes. This has allowed her to focus all her creative and planning energy on engaging multi-ability junior math classes in a BYOD environment.

W4C-5C (double session)

How can we transform our students' thinking?

Marina Krijgsman, Wendy Gibbs

Ever asked yourself:

- My students know about growth mind-set but how come it's not sticking?
- How can I address the disconnect that some students have between what they think they need to do to succeed and what they actually need to do?
- How can I get my students to be more resilient and not give up so easily? Or just even try something that looks difficult?
- How can I take all that research and knowledge I have from Boaler, Dweck, Hattie etc and build it into something that actually works in my classroom?

In this workshop we will share the journey that we have been on over the last few years to try and find some answers to these questions. This will include sharing some of our ideas, some of the strategies that we have tried and some of the results we have seen.

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

Marina and Wendy teach Y9-13 Mathematics at Rangiora New Life School.: a small integrated Yr1-13 school that has a diverse range of learners.

W4D

Collaborative Teaching in Mathematics

Dave Phillipps, Angela Frampton, Kiri Dillon

How do we create a culture of collaboration in the Secondary Teaching Environment? In this workshop we will look at how over the last 4 years we have transformed our practice and created a collaborative Mathematics teaching environment. We will share how we plan and work together, making the most of our open learning space.

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

Angela Frampton has been teaching at Lincoln HS for many years and has worked as both a Tutor and Assistant HOLA. She believes that for students to learn they must talk and think about what they are doing – there are no silent rooms in our collaborative teaching spaces!

Kiri has worked in a variety of different schools and has been enjoying the chance to be able to take the ideas of a traditional Math classroom and apply them a collaborative environment. She is currently one of the Assistant HOLA's at Lincoln High School

W4E

Nurturing Mathematical Talent

Alan Parris

Alan Parris, NZ Director for Australian Mathematics competition will address some key questions - what do we mean by enrichment, who is it for, what is available? How to use the AMC? Techniques of problem solving. This workshop will give examples and problems for participants to have a go.

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

Alan Parris is the NZ Director for the AMC. He has been involved with the NZ Olympiad programme from many years and is passionate about enriching our students especially by using these competitions.

W4F

Creating a problem-focussed maths classroom

Helen Adams

The problems that are asked and answered in a traditional maths classroom tend to be: contrived, closed, of no relevance or connection to the real world, and can be answered within 2 or 3 minutes. I have been developing and trialling a problem-focussed classroom based on 'Singapore Maths' combined with 'Bobbie Maths'. The focus of the class is on solving a big problem, using students' internal understanding and knowledge of mathematics and of the world around them. The big theme is about 'discovering' some element of mathematics or link, rather than being told it explicitly.

In this classroom there is still time and place for regular drills and skills and students are encouraged to self-manage. Whole class teaching is also relevant and has its place.

Students are empowered to be self-determining and self-directing. The teacher becomes more of a resource than a central figure.

In this workshop I will be explaining how the classroom is managed and sharing some ideas and 'big' problems that can be used in any junior classroom.

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

I am an experienced teacher of mathematics and am always looking for ways to improve my practice. I have been head of faculty in two schools but am now a regular classroom teacher which has given me more time to reflect on the changing face of Education, and to further develop some of my pet ideas about student learning and understanding.

W4G

"Here's a little article about Maths" - how I got my juniors to read, with pleasure, about Maths history

Jane Gray

Literacy in Maths-how we used Pappas' book The Joy of Mathematics for reading comprehension of general mathematical knowledge. Includes over 65 short articles in electronic form.

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

Jane Gray is HOD Mathematics at Hillmorton High School

W4H

Fusion - A year 9/10 course covering Maths, Social Science & Technology

Tara Egerton, Dave Woodcock, Justin Thompson

Key Learning Points:

Collaboration: between 3 staff members. How have we made this work? What have we learnt from it?

Cross-Curricular: How we have managed to combine our subjects. The structures we use, and how the introduction of SOLO at our school has affected it.

MLE v Traditional classroom: How we have made the journey from the 'Traditional Classroom' to our new MLE space. What effects this has had, and why not to be put off when you haven't got an MLE space.

Fusion is a compulsory course at Oxford Area School. It is taught to the whole of our year 9 & 10 cohort. It is timetabled for 8 hours a week, and has 3 teachers each lesson. We strive to teach in a cross-curricular, project based learning style. Our core subjects are Mathematics, Social Sciences and Technology, although we encompass others when we can. We are in our second year of teaching this, and will share our journey, the good and bad, and the structure we use, which is based on a Cross-curricular Matrix.

Recommended Audience: Year 9 – 10 Teachers

Tara Egerton is the HOD Mathematics at Oxford Area School. She is joined by Dave Woodcock who is the HOD Technology, also at Oxford. Tara has been teaching Mathematics at Oxford for the past 4 years, and is one of the key teachers behind Fusion, which is now in its second year.

W4I

STEM Online NZ - a free interactive teaching and learning resource for NCEA external standards in STEM subjects

Peter Radonich, Andrea Lamb

STEM Online NZ is a free interactive teaching and learning resource that currently covers Mathematics level 1 Tables, Equations and Graphs and Algebra as well as Physics Mechanics level 1 and 2. The aim is to increase the number of secondary school students successfully completing NCEA external standards in STEM (Science, Technology, Engineering and Mathematics) subjects, starting with Mathematics and Physics.

During this presentation you will be introduced to the online learning materials your students would use if you choose to use the resource in your school. The University of Auckland is responding to a New Zealand-wide specialist teacher shortage by harnessing technology in an innovative new way to compensate for STEM teaching shortages. These highly interactive online teaching and learning resources will help teachers, particularly those who are not subject specialists, teach STEM subjects. They do not replace teachers, but are designed to support teachers and engage students with content that is relevant, contextual and exciting.

STEM Online NZ is about using technology to provide an accessible, relevant and high-quality learning resource, so that every student has the opportunity to pursue a study pathway in STEM subjects through to the tertiary level.

STEM Online NZ will be freely available to every secondary school, teacher and student in NZ. By early 2018 further Mathematics externally assessed standards will be complete. We believe this resource will provide valuable support to teachers and that it will have a huge impact on the learning outcomes of the secondary school students using it.

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

Peter Radonich has been promoting the virtues of Mathematics in classrooms for almost 20 years, and despite the constant trouble this has caused, continues to do so with a smile. He is currently HOD of Mathematics at Northcote College, a role held since 2015. Peter is also currently the Mathematics Content Specialist for STEM online NZ, author of Maths resources, presenter and according to his Nana; Maths teaching-know-it-all.

W4J

Maximising mathematics learning and engagement using culturally responsive practices

Robin Averill

In this interactive and invigorating workshop we will examine effective mathematics teaching using three frameworks for culturally responsive practice (Tatōiako, values from the Pasifika Education Plan, and the whare tapa whā). We will do this by having fun exploring together a range of rich mathematical activities suitable for curriculum levels 3-7. Nau mai, haere mai!

Recommended Audience: Year 1 – 6 Teachers, Year 7 – 8 Teachers, Year 9 – 10 Teachers, Year 11 – 13 Teachers

Robin is Associate Dean (Teacher Education) at Victoria University of Wellington, Te Whare Wānanga o Te Ūpoko o Te Ika a Māui. Robin has worked extensively in primary and secondary mathematics teacher education and contributed to many mathematics books and resources. Robin's research in culturally

responsive teaching and equitable learning opportunities is grounded in teachers' and students' views and practice. Robin believes that excellent mathematics teaching develops all students' learning, and their curiosity and thirst for more.

W4K

Classify it!

Robyn Headifen

Using ideas from the late Malcolm Swann we will explore how students can be encouraged to develop their mathematical language and thinking by devising their own classification systems, how they can develop convincing arguments and engage in rich mathematical discussion

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

Robyn is an Accredited Facilitator from The University of Auckland. She was previously the Auckland regional mathematics & statistics facilitator for the Secondary Student Achievement professional learning and development contract. The role involved working with schools to improve the engagement of students through changing of pedagogical practices.

W4L

Using GeoGebra for student-centred investigations

Stephen McConnachie

If you've seen GeoGebra, you'll know that it's a powerful (and free!) tool for building applets that allow either the teacher to demonstrate a concept, or - better - for students to explore and investigate concepts themselves. This practical session will unpack some general design tips, some intermediate to advanced GeoGebra tips, and some exemplar activities to get you started. We'll also have a look at some classroom activities and investigations where students might use your applets or - better - build their own.

This session is probably not suitable for absolute beginners in GeoGebra.

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.