hcf highest common factor
Newsletter of The Australian Association of Mathematics Teachers Inc.
June 2015

From the President

Along with the Council members, the CEO Will Morony, and all the staff of AAMT, I am looking forward to meeting many AAMT members at the Biennial Conference, 6–8 July in Adelaide. It will be a wonderful opportunity to "Learn, Lead and Link" as the conference theme suggests. Preparations are well under way to make this a memorable event.

Earlier this year I was fortunate to attend the Annual Meeting and Exposition of the National Council of Teachers of Mathematics (NCTM) in Boston[1]. NCTM has over 80 000 members and over 230 affiliated associations in the USA and Canada. There were nearly 10 000 participants at their Annual meeting, and it was certainly a challenge to find one's way around such a large event. There are many similarities between NCTM and AAMT however—certainly among those attending the NCTM event I felt the same enthusiasm for passing on the enjoyment and appreciation of mathematics that I always feel at meetings of Australian teachers of mathematics at all levels, along with a shared commitment to one's students and a willingness to see them succeed.

I noticed a strong commitment to equity and access to mathematics at the NCTM conference. Among the sessions I attended was one about providing mathematics tasks with a context that would be meaningful to First Nation (Native American) students. This was a report about an initiative funded by the National Science Foundation involving collaborations between universities, colleges and schools. The presentation was given by Charles Funkhouser and Miles Pfahl and their slides are available on the NCTM website (nctm.confex.com) by searching for presentation 672 or "Native American". Although the talk was about activities for undergraduate students, most of the lesson ideas would be suitable for high school level. Ideas included the investigation of symmetry in Native American designs, geometry in structures, probability in games, and social issues such as the health of communities. Further information, including lesson plans, activities and handouts, can be found at http://mathfaculty.fullerton.edu/cfunkhouser//cfunkhouser.html.

Minority groups in American society are under-represented in maths and an organisation that sets out to assist teachers of Hispanic students is TODOS (www.todos-math.org). The Benjamin Banneker Association (http://bannekermath.org) promotes a level playing field for mathematics learning of the highest quality for African-American students. Both these groups are affiliated with NCTM and had a presence at the conference. The exhibitors' hall was huge and always buzzing as participants took in the new products, textbooks and calculators, and met there for conversations.

I only have space here to describe a few other highlights of the conference, and I must mention a session I attended that was about the teaching of mathematics for understanding, called "Nix the Tricks" (http://nixthetricks.com). This was led by Tina Cardone and an online community of teachers calling themselves the MTBoS or *MathTwitterBlogosphere*. You would find yourself agreeing with this group if you also believe that learning mathematics is about "critical thinking, justification and

1 This was at the invitation of the NCTM President, Diane Briars, but at my own expense. I gave a presentation called "The transition from school to university maths: an Australian story", which I hope will appear soon in an AAMT journal.

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using tools of past experience to solve new problems." You can download their book for free from the website and start to "Nix the Tricks" in your own classroom. I must say, I agree with the aim to have students invent their own shortcuts based on understanding, rather than relying on memorising of a few tricks that may let them down if applied in the wrong situation. For example, instead of "change the side, change the sign" it is better to use the principle of "doing the same thing to both sides of an equation". I have watched students solving $-3x = 12$ to get $x = 4$ because they used "change the side, change the sign" and divided 12 by positive 3.

Besides a focus on equity and on teaching for understanding, a big push at the NCTM was towards authentic problem solving. One of the heroes of this movement is, of course, Dan Meyer and his keynote address was a particular highlight. If you have not watched his TED talk "Math class needs a makeover", it is easy to find online and has had over 2 million views! His blog at blog.mrmeyer.com is always worth reading.

Finally, a couple of photos from NCTM: the crowd at "Nix the Tricks" and my 'selfie' with (the very tall and obliging) Dan Meyer:

Mary Coupland, *President*
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Reach for the Stars

It is with some sadness that we announce that the popular Reach for the Stars activity that has been run as part of National Literacy and Numeracy Week for well over a decade will not be conducted in 2015. This is due to budget cuts and changes to priorities for funding initiatives as part of National Literacy and Numeracy Week.

The AAMT Council regrets being unable to continue with Reach for the Stars in 2015 as it is clearly an activity that has been valued by many teachers and schools around the country. Certainly we will be looking for alternative means for funding in the future. The Council would like to thank the many teachers and others from around the country who have contributed to the project over the years, and the staff in the AAMT Office who made it all happen.

There is still a legacy from Reach for the Stars—see www.aamt.edu.au/Student-activities/Reach-for-the-Stars. There you will find data and information from the last two years that may be of use in your teaching.

Compulsory mathematics?

The reaction to Education Minister Christopher Pyne's call for mathematics or science to be compulsory to Year 12 has not been met with much enthusiasm by teachers of mathematics—at least judging by the responses to various news articles posted to AAMT's Facebook page (www.facebook.com/aamtinc). A common response is that teachers do not want to teach students who would rather *not* be in a maths class, as enthusiasm would be low on both sides. But can we make maths so interesting and compelling that students would want to be there?

This is the sort of topic that makes for an interesting debate, and members' thoughts are encouraged—whether it be in a Connect with Maths community forum, via the AAMT email discussion list, or elsewhere. There are already a couple of discussion starters and links on the AAMT Facebook page (see "Post to page" on the left hand side). Please join in—your views are important!

Maths300

Many members of AAMT are committed users of Maths300 and find it to be an extremely valuable resource for supporting them to provide better teaching and learning of mathematics in our schools. For many years, the project to develop, maintain and market Maths300 has been managed by Education Services Australia. That relationship will cease on 30 June 2015, with the Maths300 team, including Charles Lovitt and Doug Williams taking full control. From 1 July the new web address will be www.maths300.com.

Current subscribers are being contacted about the new arrangements. AAMT has commenced discussions about ways that the national and State and Territory associations can work more closely with the Maths300 organisation in the future. Watch this space!

From the CEO

STEM is an acronym currently on the lips of many politicians and in the media. After many years of inattention to the areas that underpin innovation and economic growth, let alone their contribution to the education of well-rounded citizens of the 21st century, this is a welcome development. Finally mathematics is really going to be on the map—or is it?

History sounds a caution. For many years the language in government and business has been that "science incorporates mathematics". At some levels this has been irritating—for example we have National Science Week, not National Mathematics and Science Week. Yet it goes beyond irritation that programs such as this under the name of 'science' practically do nothing to include 'mathematics'. One needs only to look at the programs for National Science Week over the years.

Or the Prime Minister's Prizes for Science Teaching. A teacher of mathematics simply cannot win that prize because the criteria are written for science teaching that emphasises experimentation and science inquiry.

These and many other historical examples of blindness to the presence, importance and value of mathematics as part of 'science' can be largely laid at the feet of those who have led those initiatives. They will say something along the lines that 'mathematics underpins all of science', but few seem able to put this into practice, with the result that mathematics is poorly represented in programs of all kinds, including those intending to shift societal views. And I don't need to remind AAMT members of how important changing the public's mindset about mathematics is to addressing long term issues of attracting and retaining students in mathematics, and for the good of the STEM skills' pipeline.

The emergence of the STEM education agenda brings with it new opportunities to shine the light on mathematics. The linking with science, technology and engineering provides a chance to demonstrate the many ways in which mathematics is integrated into those areas, and integral to them. Linking up students' learning is an attractive prospect in the light of the world in which they will live and work. But we need a careful and thorough treatment of mathematics in what goes under the banner of STEM. It cannot be a synonym for 'science' education.

One of the best ways to help realise the potential—for high quality mathematics learning—of STEM initiatives is to have authentic examples of what can be done in schools. AAMT is working with ACARA on its STEM Connections project that will do just this. The schools involved are working hard on their pilots of integrated STEM units in Years 7–10 at the moment, with the project due to report in the second half of the year. Some preliminary insights will be shared at the AAMT Biennial Conference in July.

The emphasis on STEM will undoubtedly be generating initiatives of one kind or another in many schools. If you are involved in one of these, please consider sharing your work and insights with your colleagues—locally through your own association, or perhaps through a short article in one of AAMT's journals. You could also share your work with colleagues through the Maths in Action community in the Connect with Maths project. I am sure your colleagues will be interested in your experiences and findings.

Will Morony,
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National Mathematics Day

Celebrate National Mathematics Day on Friday 21 August 2015—at the end of National Science Week.

2015 is the UN International Year of Light and Light-based Technologies, and AAMT will be preparing some teaching ideas and activities around that theme.

You may get some other ideas from www.light2015.org.

Look on the AAMT website closer to August. The availability of activities will announced in e-news bulletins.

New APMC editor

AAMT Council has appointed a new editor of the journal *Australian Primary Mathematics Classroom* (APMC). Lorraine Day, a Senior Lecturer in Mathematics Education at the University of Notre Dame Australia (WA), will start working on the journal in the second half of the year as the editorship is handed over from Catherine Attard (University of Western Sydney).

Many thanks to Catherine who has served as editor since mid-2013 and whose highly efficient and valuable work on the journal has been appreciated by AAMT production staff and by readers in turn!

Best wishes to Catherine and welcome Lorraine!

AAMT conference webinars

AAMT is very excited about its first live streaming of certain events at the AAMT biennial conference, 6–8 July—and they're all free to watch courtesy of the Connect with Maths webinar program!

Monday 6 July 2015

11.00 – 11.55 am CST
Interactive humanoid robotics for mathematics teaching
Jonathan Kingsley, Jen Bowden

Tuesday 7 July

10.45–11.40 am CST
Data Drop, Raspberry Pi and Wolfram Language: An avenue for computational exploration
Craig Bauling

1.45–2.40 pm CST
The Mathematical Games Kit – Mandalany
Lillian Miller

2.50–3.45 pm CST
NAO research project
Monica Williams, Desiree Gilbert

Tuesday 7 July, 2015,

4.15–5.10 pm CST
Capitalising on ICT in the mathematics classroom
Rosemary Callingham, Tracey Muir

Wednesday July 8

10.30–11.25 am CST
Parents as educators: Mathematics in the home
Jennifer Bowden, Ellen Corovic

11.35 am – 12.30 pm CST
Five ways forward
Caty Morris

1.30–2.25 pm CST
Mobile maths: The phone, the location, the game and the maths
Roger Edmonds

For more information about these webinars, go to www.aamt.edu.au/Communities/Webinars/AAMT-Conference.

New President Elect and changes to AAMT Council

AAMT's new President Elect is Allason McNamara from Victoria, who was the only nomination. She will take up the position of President after the AAMT Annual General Meeting in May 2016.

Allason is the Head of Mathematics at Mount Scopus Memorial College. She has a Masters in Mathematical Modelling and Data Analysis and has been a co-author of several mathematics texts. Allason is a former President of the Mathematical Association of Victoria. She has served on the AAMT Council for several years, firstly as Councillor for Victoria, and then as Treasurer.

Allason's appointment as President Elect means that she has stepped down from her position of AAMT Treasurer; the Council has appointed Jurek Paradowki, who has just retired as Councillor for the ACT and was a member of the Finance Sub-Committee, to fill that position until the next election for Treasurer due in 2016.

Newly appointed Councillors are Lauren Beams (Tas.), Rom Cirillo (WA), Bronwyn Welch (ACT), and Matt Skoss returns to the Council representing the NT.

Many thanks go to retiring Councillors John Bament (NT), Sylvia Eadie (Tas.) and Richard Korbosky (WA) who have served on the AAMT Council since its reform in 2012. Special thanks go to former President Kim Beswick (Tas.) who now stands down as Immediate Past President after having served tirelessly on the Council in that critical Presidential role for the past four years.

You can find contact and other information about the Council at www.aamt.edu.au/Contact.

AAMT Council after the AGM. Standing (left to right): Christine Slattery (SA), Rodney Anderson (Qld), Sylvia Eadie (Tas.), Jurek Paradowski (ACT), Karen McDaid (NSW), John Bament (NT), Will Morony (CEO), Jim Spithill (Vic.), Richard Korbosky (WA). Seated (left to right): Kim Beswick (Immediate Past President), Mary Coupland (President), Allason McNamara (Treasurer).

The Australian Association of Mathematics Teachers (AAMT) Inc. is a federation of:

Canberra Mathematical Association (CMA)
Mathematical Association of New South Wales (MANSW)
Mathematical Association of South Australia (MASA)
Mathematical Association of Tasmania (MAT)
Mathematical Association of Western Australia (MAWA)
Mathematical Association of Victoria (MAV)
Mathematics Teachers Association of the Northern Territory (MTANT)
Queensland Association of Mathematics Teachers (QAMT)