hcf highest common factor
Newsletter of The Australian Association of Mathematics Teachers Inc.
November 2016

From the President

National Literacy and Numeracy Week (NLNW, www.literacyandnumeracy.gov.au) was held this year from 29 August to 4 September. Many students, teachers and parents participated.

A team from AAMT and the MAV coordinated the development of the NLNW numeracy activities which were designed to stimulate curiosity and make connections to everyday contexts: *Who Won It?*, *Which Way?*, *Thinkers are Winners* and *Catch an Idea*. All the numeracy activities were designed to enrich mathematical understanding of language and concepts. They are aligned to the Australian Curriculum, are open-ended, and provide for differentiated learning opportunities. AAMT has archived the activities at www.aamt.edu.au/Student-activities/NLNW/2016.

AAMT also worked closely with the Australian Literacy Educators' Association (ALEA), strongly supporting the event to raise awareness and promote the equal importance of numeracy and literacy in the Australian community. This collaboration advocates to the broader community that literacy and numeracy are essential lifelong skills. Many of the skills and proficiencies in all activities, including those within the digital literacy activities, are designed to engage students in practical and real-world learning.

You may have noticed that NLNW inspired many social media posts on Facebook, Twitter, and Vimeo by maths enthusiasts promoting this important week. NLNW was the catalyst for many practical face-to-face events involving school communities in learning and celebration: the Mad Hatter's morning teas, mums and numeracy sessions, performances, dramatisations and numeracy games. These high profile events help build school culture, promote positive dispositions and imaginative ways of learning mathematics.

High profile Australians, public champions of mathematics and educators, all effective in community outreach, brought a fresh approach to the NLNW event. Mathematicians with a penchant for comedy also helped us with NLNW this year. Our thanks to Simon Pampena, Matt Parker and Adam Spencer for their contributions.

AAMT is supporting an ongoing NLNW activity, *Catch an Idea*. *Catch an Idea* is the chance to catch a maths moment! Students and teachers photograph a mathematics moment, caption it and share it. For example, a photo of someone measuring ingredients, tiling a roof or a football player kicking a goal. This activity promotes and acknowledges that maths is everywhere and that maths helps to make sense of the world.

Now is time to be thinking about getting involved for the 2017 National Literacy and Numeracy Week. Take a moment to look at the activities on the NLNW website. Put the first week in September into your diaries. Be ready to "explore, learn and enjoy" with your students and families!

Mention of 2017 reminds me that this school year is rapidly drawing to a close. I hope you have a great holiday period and a good break that sees you return to refreshed and revitalised.

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supporting and promoting mathematics education

From the CEO

Recently I was able to attend the awards ceremony for the National Mathematics Talent Quest (NMTQ) in Melbourne. It was rightly a joyous occasion for the winning students as well as those parents and teachers able to attend. The NMTQ can tend to fly a little below the radar in the scheme of things at AAMT. Attending the culminating event caused me to think a little about it. I'd like to share my thoughts on what the NMTQ embodies.

Talent quests involve students—either as individuals, in small groups or as a whole class—undertaking a mathematical project of interest to them. Often the investigation is one they have identified for themselves; and certainly their project takes some time to complete. Judging their products is done locally, with winners progressing to regional, then state and finally national levels.

Well over twenty years ago, the Mathematical Association of Victoria (MAV) had established the Mathematics Talent Quest in that state. It was the first of its kind. MAV representatives floated the idea of adding a national element as an AAMT activity. As a result, several states and territories set up their versions of talent quests, with the AAMT Office coordinating the national judging and awards ceremony of the NMTQ.

Over time the talent quests in a number states and territories lapsed—the associations involved had other priorities. As a consequence, the 'national' in NMTQ was at risk of being a misnomer. In response, around five years ago the MAV did two things: First, they arranged for students in other states and territories to be able to enter through the Victorian MTQ. Second, they undertook to coordinate the national judging and awards ceremony, albeit with AAMT continuing to fund the trophies, etc.

Fast forward to 2016 and I sense that talent quests are having something of a revival. There were judges from five states who attended the national judging, several with a view to reviving the quest in their local association. I hope this gains momentum and we again see vibrant talent quests across the country.

Why? In short, I think that being part of a talent quest is an experience that should be part of the mathematics education of all young people. The level and quality of the mathematics that students demonstrate in their projects is critical, of course. But a range of other descriptors come to mind when I think of what the winners achieve, and how they work: Creativity. Communication. Connections with the 'real world'. Problem solving. Perseverance. Teamwork. Pride in their mathematical work. All these and more are what a balanced mathematics education for the 21st century must be about.

In my talk to the students and their parents at the ceremony, I congratulated them on their achievements as the 'best of the best'. However, I made a point of saying that I thought everyone who enters a mathematics talent quest is a winner, precisely because practising and learning these 'soft' skills through mathematics helps them grow in ways that will help them as people living in the 21st century.

I also noted that the winners would not be there without the efforts of their teachers, and that they should thank their teachers for going the 'extra yard'. Children and families need to understand that teachers put themselves out and very often take on extra work when they enrol students in extracurricular mathematics activities like a talent quest. They do it willingly, in the students' best interests, of course, but recognition and thanks go a long way to sustaining their extra commitment.

I therefore closed by thanking all the teachers who entered their students, the many teachers who gave their time to be part of the judging, and the Council and membership of the MAV—almost all of them teachers as well—for their contributions to the mathematical 'health' of our nation.

Finally I would like to express my appreciation for the support I have received from AAMT Council, staff and many others in 2016. I wish them, and all members, the best for the coming holiday season.

Will Morony,
Chief Executive Officer
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Connect with Maths

AAMT's Connect with Maths project has formally finished, but it is anticipated that much of the groundwork established by the project in terms of community-building and webinar programs will be continued as part of AAMT's *Dimensions* professional learning portal. Watch out for the launch of Dimensions in 2017!

In the meantime, you can find many of the Connect with Maths webinars at www.vimeo.com/aamtinc.

National Mathematics Talent Quest results

Foundation Class Winner
Planning A Tea Party
Milgate Primary School
FJP

Foundation Individual Winner
Teenage Mutant Ninja Turtles Party
Regency Park Primary School
Liam Orlandi

Year 1 Class Winner
Beyond A Shadow Of A Doubt
Milgate Primary School
1JJ

Year 1 Group Winner
Were We Separated At Birth? Can Maths Help Us Find Out?
St Thomas More Primary School
Layelle Ali, Zoe Sardo

Year 1 Individual Winner
The 65 Storey Treehouse
Arden Anglican Junior School
Finn McDonald

Year 2 Class Winner
The Mathematics Of Toothpaste
Santa Sabina College
2LIDD

Year 2 Individual Winner
Water – Is It Going Down The Drain?
Penleigh and Essendon Grammar School
Philippe Bassan

Year 3 Class Winner
All Hands On Deck!
Santa Sabina College
3ANET

Year 3 Group Winner
Toys Or Us
Penleigh and Essendon Grammar School
Tom Jenkins, Jason Tran Year 3

Year 3 Individual Winner
Pattern, Table, Products
Firbank Grammar School
Olivia Smith

Year 4 Class Highly Commended
Can We All Go To Assembly?
East Launceston Primary School
4 Sheedy

Year 4 Class Winner
Sphero Heroes: Chariot Challenge
Milgate Primary School
Year 4 Sphero

Year 4 Group Winner
Plane And Simple Maths
Jells Park Primary School
Emma Holbrook, Jessica Wongprasartsuk

Year 4 Individual Winner
The Maths Of A Letter
Carey Baptist Grammar School
Nadia Kober

Year 5 Class Winner
Our Class Market – What Is The Maths Involved In Money?
Milgate Primary School
5JC

Year 5 Group Winner
How Many More Students Can Enrol At Port Melbourne Primary School Before Reaching Maximum Capacity With Existing Land Size And Buildings And When?
Port Melbourne Primary School
Abby Lang, Emily Morgan

Year 5 Individual Highly Commended
Can I Find The Length Of A Tangent On My Late Grand Auntie's Antique Tricycle?
Craigslea State School
Jed Hoo

Year 5 Individual Winner
Measuring Really Tall Structures Using Everyday Materials
Seaholme Primary School
Christopher Tran

Year 6 Class Winner
"Key To Our Quay": Using Mathematics To Describe And Measure Sydney Harbour
North Sydney Demonstration School
6KS

Year 6 Individual Winner
We're On Earth Shall We Go?
Milgate Primary School
Sarah Leembruggen

Year 7 Class Winner
Maths Behind An Action Movie
Kincoppal-Rose Bay School
7MA1

Year 7 Group Winner
Games of Chance
Tara Anglican School for Girls
Tanisha Kolodochka, Olivia Lim, Evelyn Moon, Caitlin Wong

Year 8 Group Winner
Ravenous Rabbit
Lilydale High School
Katelyn Radmanic, Kaitlin Toleman

Year 8 Individual Winner
Propeller Evaluation
John Curtin College of the Arts
Bridget Chivers

Year 9 Individual Highly Commended
Mathematical Thinking And Its Limits
Tintern Grammar
Eddie Yu

Year 9 Individual Winner
Selfie On The Titanic
Loreto Normanhurst
Lauren Howard

Year 10-12 Group Winner
Marvel Maths
Mornington Secondary College
Josie Turner, Oskar Morrison-Petersen, Olivia Secoulidis, Kailyn O'Connor, Jasmin Pratt

Year 10-12 Individual Winner
Mathematical Modelling Of An Effective Drug Dosage For Patients Using Differential Equations, Exponential Decay And Geometric Series
Queensland Academy of Science, Mathematics and Technology
Georgina Sheu

NAPLAN results

The NAPLAN results were released recently. There has been some improvement since 2008 but not in recent years. AAMT President Allason McNamara attended a NAPLAN analysis session which was run by Philip Holmes-Smith from the School Research Evaluation and Measurement Services (SREAMS) who expressed concern that there is a widening gap between the bottom and top students. For the middle 70% of students, there is about a four-year spread in Year 3, and more than a seven-year spread by Year 9. Growing all our students at the same rate would mean that our weakest students would never catch up. The weaker students need to be growing at a faster rate than our better students. International comparisons (PISA, TIMMS, PIRLS) suggest Australian results are declining—both in real terms and relative to other countries too. Allason saw merit Holmes-Smith's effective teaching cycle designed to assist students to reach the growth targets:

A 10-step effective teaching cycle

1. Learning intentions. What do I want them to learn?
2. What are the success criteria?
3. Initial feedback. Write a pre-assessment and give feedback.
4. Develop engagement.
5. Effective explicit teaching – model good and poor examples.
6. Guided practice.
7. Ongoing feedback.
8. Summarise and reflect.
9. Post-assessment – what has been the growth?
10. Revise.

reSolve: Maths by Inquiry

To date, the project has received around 400 expressions of interest in trialling classroom materials, with good representation across all education sectors. Teachers of younger students are looking forward to being able to access trial lesson sequences for Foundation to Year 4 during the first semester of the 2017 school year. Outreach Officers in each State and Territory have been active in engaging teachers involved in trialling reSolve materials in Years 5–8, with teachers from other year levels also trialling materials with success. The reSolve team is grateful for the quality of the feedback that is coming from field testing. If you would like to be involved in trialling lesson sequences, please complete an expression of interest at http://tiny.cc/mbi-eoi-trialling.

You can subscribe to the reSolve newsletter via http://tiny.cc/mbi-newsletter.

Professional learning modules are being piloted with a range of school groups, with feedback informing the refining of the resources. If you would like to trial any of the professional learning modules with your staff in after-school sessions or pupil-free days—or have further queries about reSolve—please contact:

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2017 Mathematical Modelling Challenge

The 2017 Australian phase of the International Mathematical Modelling Challenge (IMMC) will be held between 14 March and 7 April. IMMC is an international event established to promote mathematical modelling in school mathematics. The Australian phase will involve teams of up to four students from the same school working collaboratively to solve a problem (set globally) by devising and applying an original mathematical model. The best Australian entries are entered in the international phase with more than 20 countries participating.

For more information, and to see how to register a team from your school, go to: www.immchallenge.org.au.

AAMT 2017 conference: Capital Maths

The 25th Biennial Conference of the Australian Association of Mathematics Teachers will be held at the Canberra Convention Centre from 11–13 July 2017.

Keynote speakers will be

- Rhonda Faragher, University of Queensland
- Chris Franklin, University of Georgia, USA
- Peter Neumann, Oxford University, UK
- Chris Wetherell, Radford College, ACT

Offers to present seminars and workshops are now being sought.

For information about the conference and to register, go to http://tiny.cc/aamt2017.

AAMT office closure

The AAMT office will closed for the festive period after 22 December 2016 and re-open on 3 January 2017.

The AAMT Council and staff wish all members a very happy and relaxing holiday period.

AAMT journals

All of the editors of AAMT's three journals will be continuing in their current roles for 2017:

- *Australian Primary Mathematics Classroom*: Lorraine Day (University of Notre Dame, Australia)
- *The Australian Mathematics Teacher*: Maree Skillen (University of Technology, Sydney)
- *Australian Senior Mathematics Journal*: Jill Brown (Australian Catholic University)

Thanks to the editors, reviewers and especially authors for their contributions in 2016.

Editors would welcome contributions from teachers about successful classroom practices or teaching ideas. Writing an article is great professional development too! For more information see www.aamt.edu.au/Journals or contact the AAMT office.

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)