



This national newsletter has been produced by the **National Kaiārahi with the support of NZAMT and the Regional Mathematics Associations**, as part of Network of Expertise funding.
 NZAMT Contact: P O Box 26-582, Epsom, Auckland. <http://www.nzamt.org.nz>

Network of Expertise Newsletter: Mathematics and Statistics

Information and resources for Year 1 – 13 teachers | Term 4 2019

Whakatauki

Kirihou kore - kawea ake! Take up the challenge!

Welcome back, term 4, 2019

We hope you have all had a relaxing break and have returned refreshed for the last term.

NZAMT16 Conference 1 – 4 October, 2019

Hosted by the Wellington Mathematics Association for Y1-13 teachers.

The theme for the conference is: 'Coming together to celebrate the teaching and learning of Mathematics and Statistics.'

'E WHAKAKŌTAHI ANO KI TE WHAKANUI I TE KAUPAPA I TE PĀNGARAU ME TE TATAURANGA.'

The focus of the conference is on:

- * Celebrating and sharing the art of teaching mathematics and statistics

- *
- *

- * Connecting to the community.

Over 145 workshops including industry visits. 350+ registrants over the 4 days. NZAMT16 week started with the VUW symposium where 40 + pre-service tertiary educators met to discuss and share research across NZ in relation to Mathematics and Statistics. Then 8 keynotes, 8 workshops and some evening socialising. **Links:** Home page: <https://nzamt16.nz>

Partners page: <https://nzamt16.nz/partners> Keynotes: [Keynote folders](#)

Workshops page: <https://nzamt16.nz/workshops>

The NZAMT16 website is open until 31/12/2019 and from 1/1/2020 the files will be archived to the NZAMT website.

Some comments:

"A great conference with many research-practice links made throughout. It was really great to see the reinforcement of key ideas from varied research being reflected across and discussed in many of the keynote talks and workshop sessions."

"Ka nui te mihi ki a koutou ko te komiti whakahaere. The conference was great."

"What a grand event you organised. Not once did I see or hear anything even mildly negative about the event. I hope that each of you feel a great sense of achievement as a result of what you created and so nicely supported to unfold over the four days. The level of support from airport to airport (Judy and co) was impeccable."

"Thank you for an amazing conference."

"The app was good, info and feedback. I am still amused by the individualised programme that was on my screen. Your app man needs a medal for that."

Recent NZAMT Bevan Werry Speakers List

<http://www.nzamt.org.nz/nzamt-awards/bevan-werry>

2019 – Congratulations to Jasmine Hall for being selected as the 2019 Bevan Werry speaker at the NZAMT16 Maths Conference.

Jasmine is a PhD student at the School of Mathematics and Statistics at Victoria University. She will be available to regions to do presentations and support mathematics teachers and students.



Reciprocity
STEM

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<http://www.nzamt.org.nz/latest-news/87-2019-bevan-werry-speaker-announced>

Here is a link to the Mathematicians Lament that Jasmine referred to: https://www.maa.org/external_archive/devlin/LockhartsLament.pdf
Jasmine can be contacted via: jasminelh91@gmail.com

2017 – Kevin Hannah kevin.hannah@canterbury.ac.nz

2015 – Professor Michael Thomas moj.thomas@auckland.ac.nz

2013 – Dr Dillon Mayhew dillon.mayhew@vuw.ac.nz

2011 – Dr Naomi Ingram naomi.ingram@otaqo.ac.nz

2007 – Dr Bobbie Hunter r.hunter@massey.ac.nz

2005 – Dr Pip Arnold pip@karekareeducation.co.nz

History, information and biography:

<http://www.nzamt.org.nz/nzamt-awards/bevan-werry>

The Bevan Werry Trust covers the travel costs of an active Bevan Werry speaker if regional Mathematics associations would like to have them speak or be involved in your region. Please approach each with plenty of time for this to be organized as they are teachers and educators working in respective school, universities or for some are now retired.

Ministerial Advisory Group's final report

Details about next steps for the CPA work are now available through the [Education Conversation](#) website and via the links below. In response to the MAG's advice, the Minister of Education has asked the Ministry to work in collaboration over the coming months to:

- develop a process for updating our national curriculum to make sure it's fit for purpose, and reflects our aspirations for all children and young people
- develop resources that make it easier to recognise and respond to each student's progress
- develop a common approach to holistic records of learning that travel with students throughout their learning journey – so that they, their parents, whānau and teachers can see, understand and support their progress
- create a trusted environment for using information about student progress that benefits all children and young people's learning.

We will also work collaboratively to progress the MAG's recommendations to strengthen leadership, networks and capability, and improve access to resources.

This work will be progressed collaboratively with Māori and Pacific, teachers, leaders and others from across the education sector in both Māori and English medium contexts, and of course students and their whānau. It will build on what we have heard through your work and the wider Education Conversation, Kōrero Mātauranga over the last 18 months.

In line with your advice, these changes will not be rushed – so there'll be time for everyone to engage with them, and to work with us on how best to integrate them into their practice.

We would value your ongoing involvement with this work. If you or someone from your organisation is interested in joining one of the working groups being established to progress this work please let us know by return email.

Please do share all of this information with your networks. It would be great if you could also share the CPA-related posts on the Ministry's Facebook and Twitter accounts, or NZC Online, through your own social media pages.

Links to more information:

[Detailed information about next steps](#)

[Overview of the changes for schools and kura](#)

[Frequently asked questions](#)

[Strengthening curriculum, progress, and achievement in a system that learns: executive summary](#) of the report by the Curriculum, Progress and Achievement Ministerial Advisory Group

[Strengthening curriculum, progress, and achievement in a system that learns: report](#) by the Curriculum, Progress and Achievement Ministerial Advisory Group

[information for schools to share with parents, whānau and communities](#)

The advice to Ministers will be published on the [Advice seen by our Ministers](#) section of the Ministry's website later this

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New Zealand Mathematics Society



<https://nzmathsoc.org.nz/>

New Zealand Statistical Association



<https://www.stats.org.nz/>

week: <http://education.govt.nz/our-work/information-releases/advice-seen-by-our-ministers/>

Australasian Biometrics Poster Competition

The Australasian Region of the International Biometric Society is holding a special poster competition for Y9-10 school students, showcasing statistical methods and explorations of problems related to Biometrics (e.g. agriculture, ecology, health etc).

Prizes will be awarded to the top 3 entries that can demonstrate a clear statistical inquiry to a Biometrics problem. Prize amounts consist of:

1st Prize \$AUD300

2nd Prize \$AUD200

3rd Prize \$AUD100

Posters can be submitted through the SSA National Schools Poster Competition website, which will house a special check button for this competition. Winners will be announced at the 2019 Australasian Region Biometrics Conference, where students and their teachers/carers can 'zoom in' to virtually attend the awards ceremony.

Entries close: 10 November, 2019.

For more information visit: ausbiometric2019.org/school-posters

The Prime Minister's Science Teacher Prize

If you know of a talented school teacher that teaches maths, science or technology then nominate them and encourage them to apply!

Visit: <https://www.pmscienceprizes.org.nz/about-the-prizes/teacher/>

This prize will be awarded to a permanently appointed **registered teacher** who is teaching science¹ to school-age children (in a primary, intermediate or a secondary New Zealand registered school) and who has been in the same role at the same school for at least 12 months prior to their nomination.

The Prime Minister's Science Teacher Prize is worth \$150,000. The recipient will receive \$50,000 with no expectations and the recipient's school will receive \$100,000 to use for the development of science.

English to Te Reo – Common Mathematical and Statistical terms

<https://www.nzqa.govt.nz/assets/qualifications-and-standards/qualifications/ncea/NCEA-subject-resources/Mathematics/NZQAMathematicsTermsEng-Mao.pdf>

<https://www.nzqa.govt.nz/assets/qualifications-and-standards/qualifications/ncea/NCEA-subject-resources/Mathematics/NZQAMathematicsTermsMao-Eng.pdf>

Videos on using statistics in research and industry

<http://www.maths.otago.ac.nz/videos/statistics/Dolphin/index.html>

<http://www.maths.otago.ac.nz/videos/statistics/>

YouTube videos to support mathematics and Statistics teaching

<https://www.youtube.com/user/ElizabethSneddon>

https://www.youtube.com/results?search_query=infinityplusone

Yvonne Culling's Blog on learning Mathematics and Statistics in Primary School

Yvonne shares her ideas and tips with others. Yvonne was a recipient of the 2018 Ernest Duncan award.

Here is a link to Yvonne Culling's maths one stop website for Primary Teachers. <https://sites.google.com/arrowtown.school.nz/math/home>

Changes to the nzmaths forums.

The NCEA forums are going to be replaced with CL 1 – 8 forums that are linked to the achievement objectives thru the 3 strands:

- Number and Algebra
- Measurement and Geometry
- Statistics and Probability.

These will be attached to the **Elaborations** to assist **ALL** teachers in teaching the NZ Mathematics and Statistics curriculum.

The current forums will be available to view **ONLY** until the end of term 2, 2019 and then archived.

The new forums are currently being developed and will be made live when the nzmaths has an update of their website.

Term 4, 2019 Professional Development in algebra. Suitable for teachers from Y5 - 11

"MathsCraft - Doing mathematics like a research mathematician."



Māori Success

Click [here](#) to read our **Change Agenda: Income Equity for Māori** report

Click [here](#) to read our call to action in **Creating the Catalyst for Māori Success** or check our website at www.maorifutures.co.nz You can download their Blue Print from:

http://www.maorifutures.co.nz/wp-content/uploads/2019/07/Tokona_Te_Raki_Template_v06.pdf

The Art of Statistics

Kim Hill on Radio NZ had a long interview with David Spiegelhalter, who is Professor of the Public Understanding of Risk, at Cambridge. David Spiegelhalter has built a career from sorting the lies and the damned lies from the statistics. In his new book 'The Art of Statistics' the Cambridge Professor shows his passion for data, numbers and evidence, and how risk gets reported to us by scientists and the media. So bacon kills? Well, not so much. And don't get him started on average house prices! He even collects thousands of coincidences, trying to separate the operation of chance from something far more significant.

His a new book is found here, "[The Art of Statistics: Learning from Data](https://www.rnz.co.nz/audio/player?audio_id=2018712277)".

https://www.rnz.co.nz/audio/player?audio_id=2018712277

He talks of:

- Clickbait and misleading headlines
- Unpacking research claims
- Dispelling myths from stats in the interview.

Transcript: (edited a bit...)

Kim: "Is statistics taught at school in the UK?"

David: "Yes, but not as well as in New Zealand. New Zealand is the world leader in statistics education. In my book, I give full credit for stealing from New Zealand's way of teaching statistics in schools. It's quite extraordinary the progress that's made. I tell you, you may not know from inside in New Zealand, but New Zealand has a fantastic reputation for education both in statistics and computing. It is an amazing achievement."

"So I am full of praise and we trying to emulate many of the ways in which statistics education has been developed in New Zealand, which we are trying to get into much more for the UK system. It's based on real practical problems, problem-solving all the time; not just theoretical and abstract ideas. It is an important issue how do we use and deal with data. That down-to-earth approach is extraordinarily powerful, and we hope to emulate it here. ..."

It's great to teach young people to do the stats as well. There's an enormous demand for data scientists in the future ...

Links: <http://www.statslab.cam.ac.uk/~david/> and

https://en.wikipedia.org/wiki/David_Spiegelhalter

And on Saturday 31st August: Hadley Wickham on RNZ

Data scientist Hadley Wickham is developing open source ways to help people collect and analyse the information that surrounds us every day. He's yet to meet a data set he doesn't like and loves poring over his own heart rate statistics, hospital admissions data, and obscure surveys of national eating habits. As well as revealing that bananas were by no means a common food in the 1970s, his work also helps businesses and journalists make sense of the data around them. Born in New Zealand, he grew up in Hamilton and studied in Auckland before moving to Houston where he's now based. **Link:** [hadley-wickham-open-source-data-wrangler](https://www.rnz.co.nz/audio/player?audio_id=2018712277)

Kim starts with a 2 min text from a researcher who is extremely positive about statistics and Hadley's contributions to it.

Regional Updates:

Otago-Southland NoE – Otipoti LEAD TEACHERS MEETINGS

Recently I (Noel) attended two lead teachers' meetings in Dunedin. The lead teachers are primary school teachers who have taken on the responsibility of Mathematics teaching in their school. The sessions are organised and run by Viv Thompson, a primary trained teacher who is now a facilitator for primary school mathematics in Otago and Southland.

These meetings have been run monthly for 12 years. Each meeting had around 12 teachers and those attending discussed the new local curriculum guides and considered ways of using Cuisenaire rods to model fractions, decimals and powers. Most were willing to talk about successful ways they had used the rods in their classrooms. There was a lot of interest and enthusiasm about using rich mathematical tasks in their teaching.

Learning Progression Framework (LPF), PaCT and the ARBs

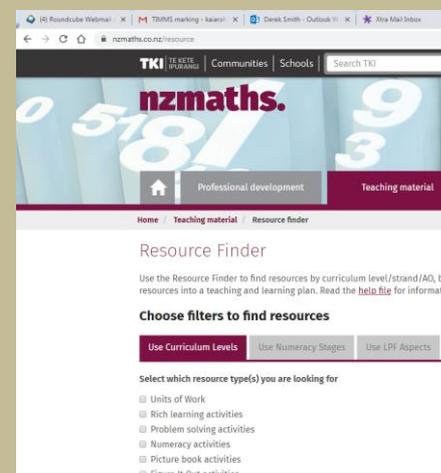
NZAMT and some of the regional Kaiārahi have attended the framework workshops for facilitators and are able to run workshops on the LPF and PaCT. We have also teamed up with NZCER and links to the ARBs have been made to the 8 aspects. See:

<https://curriculumprogressiontools.education.govt.nz/lpf-tool/>

If you are interested in being informed about the LPF, PaCT and the ARBs then contact your regional or National Kaiārahi.

We can guide you through the 'big ideas', the sets of illustrations and making the OTJs.

nzmaths has also linked their activities and units of work to the LPF through the 'Resource Finder' and teachers can now search for activities either by Curriculum level, Numeracy stages or by the 8 LPF aspects.



<https://nzmaths.co.nz/resource>



The NZCER ARB URLs are:

Maths

<https://arbs.nzcer.org.nz/node/19556/>

Writing

<https://arbs.nzcer.org.nz/node/19557/>

Reading

<https://arbs.nzcer.org.nz/node/19558/>

I was impressed with their keenness to present inclusive and well-structured lessons. There was a free and open discussion of pedagogy that had proved effective in their classrooms. It is admirable how they have embraced 'mixed ability classrooms', a demanding and challenging way to teach. Secondary teachers would do well to consider the merits of this approach to teaching. I think that eventually we will all be expected to run our rooms as mixed ability groupings. It is fair, egalitarian, and respectful of children's potential to learn. The free exchange of ideas, experiences and opinions was uplifting to witness. These lead teachers are motivated to produce lessons that are effective for all pupils, regardless of the school they attend.

If these PLD sessions are being run in your region I would recommend you attend and bring along a nice thinking problem to share.

Northland NoE in the Spotlight

Northland held an NMA/NOE Mathematics and Statistics day at the end of the Term 2 holidays. Around 80 Northland Teachers attended the day gaining valuable PD as well as building and maintaining relationships with their Northland Colleagues. 19 workshops were offered by some notable presenters and they covered a range of strands and topics. We were overwhelmed by the positive feedback the day received and are now running something similar in the Far North in October.

Studyit - helping NCEA students to study

The Studyit website now has a fresh new look and navigation – in time to support students as they head into NCEA exams for this year. Studyit has been on-line since 2004, helping NCEA students with study and exam advice in maths, science and English.

The new website's simpler, more accessible platform makes it easier for students to find what they're looking for. And students can continue to ask questions and receive answers from experienced secondary school teachers through the forum function.

Studyit is now also more responsive to being viewed on mobile devices. Students can download information to all of their devices, so they can view standards offline and save data.

Anyone visiting the old URL will be automatically redirected.

From the 'Learn about a standard' button on the homepage, students can visit the Mathematics level they are studying at and then the standard they are working on. Here they will find achievement criteria, links to revision material and key tips.

The 'Ask a question' button on the homepage takes students to the forums, one for each level of mathematics with the standards listed for that level. To post a question click on the standard of interest, then the '+ New Topic' button. Add a relevant topic and type the question and click 'Create Topic'. Studyit also has a Tips and Tricks section accessed from the menu in the top right corner of the home page. Here students will find study and exam advice and tips on Hauora and mental wellbeing.

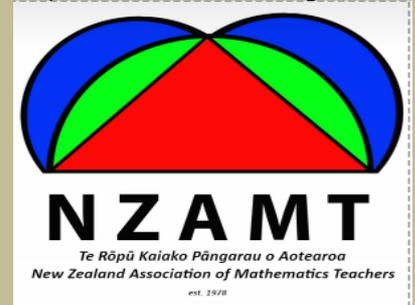
The new URL is <https://studyit.govt.nz>

Nga mihi rā

National Kaiārahi and Regional Kaiārahi for Networks of Expertise, Mathematics and Statistics.

Term 3, 2019 - The Mathematical Challenge Solution

NZAMT's logo is an image of a semicircle, lune and triangle. What mathematical relationships can you find with the image?



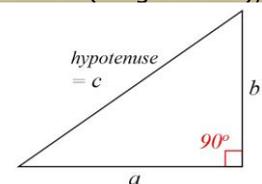
See the area of the Lune youtube video for explanation:

<https://www.youtube.com/watch?v=1uEgvF5Xfe4>

Term 4, 2019 - The Mathematical Challenge

The Pythagorean Theorem involves the lengths of the sides of a right-angled triangle.

It states that, "The sum of the squares of the lengths of the two short sides ('a' and 'b') is equal to the square of the length of the hypotenuse (longest side), 'c'."



$$c^2 = a^2 + b^2$$

Can you prove the Pythagorean theorem from the diagram given below:

