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 2018

Whakatauki Ma whero ma pango ka oti ai te mahi. With red and black the work will be complete. This refers to co-operation, if everyone does their part, the work will be complete. The colours refer to the traditional kowhaiwhai patterns on the inside of the meeting houses. URL: https://tinyurl.com/y9llrhk8, a shortened weblink from nzmaths.

Welcome to term 4, 2018 I am writing to you as the newly appointed National Kaiārahi for the Mathematics and Statistics Networks of Expertise. As part of the contract with the MoE, NZAMT and the Regional Mathematics Associations will be coordinating, creating and distributing a newsletter each term. This is an opportunity to share practices/resources/information across the country and within the newsletter there will be opportunities to inform all of what is happening in our classrooms, schools, Kahui Ako (CoLs), locally, regions and nationally. If you have upcoming events in your region (planned for term 4 and also during 2019), advertising for teaching positions, requesting support for PLD, content knowledge, building capacity in some aspect of mathematics and/or statistics, webcasts etc., then please share this by sending the information to kaiarahi@nzamt.org.nz, so that it can be acted upon or shared across the country. There will be an e-platform and website set up for the Mathematics and Statistics Networks of Expertise (work in progress), this is expected to be in place for viewing and connecting at the start of the 2019 school year.

The Kaiārahi role Overall, this role seeks to strengthen teaching and learning in Mathematics and Statistics. The PLD support seeks to develop teachers’ capabilities and capacity for embedding teaching as inquiry, developing student and teacher agency, facilitating community consultation, enabling e-learning and developing students’ digital fluency, and enhancing culturally responsive pedagogy. The approaches to teaching and learning the Kaiārahi role will support, are underpinned by Ministry of Education and Education Council documents, such as: New Zealand Curriculum, Tātaiako, Tapasā, and the teachers’ code and standards of conduct. The main roles and responsibilities of the Kaiārahi include:

● helping provide advice and guidance for teachers around pedagogy, curriculum and assessment through face-to-face or virtual meetings or by email and phone

● providing a regular (termly) national newsletter with updates and information pertinent to Mathematics and Statistics

● enhancing an online presence of NZAMT

● involving in an agreed capacity in a range of Networks of Expertise: Mathematics and Statistics PLD activities (e.g. workshop facilitation, review of or the writing of resources, etc.,) The Kaiārahi role comes with an expectation that all regions within New Zealand and the teachers of Year 1 - 13 classes have access to support in good practices in Mathematics and Statistics education. This may involve providing video presentations or podcasts, to assist and connecting to as many teachers as possible. The role requires the development and maintenance of professional relationships with the executive of NZAMT, the regional Kaiārahi, all teachers and NZAMT well and the 14 regional Mathematics Associations and schools to work together to plan, coordinate, deliver and evaluate PLD opportunities and on-going support for members and non-members of the respective subject associations.

The Network of Expertise initiative is funded by the Ministry of Education. NZAMT Contact: P O Box 26-582, Epsom, Auckland, http://www.nzamt.org.nz 1

Contact details for the National and Regional Kaiārahi

National NZAMT Derek Smith Phone: 027 460 2871 E: kaiarahi@nzamt.org.nz

Northland Sandra Cathcart (interm) Phone: 027 555 4660 E: s.cathcart@auckland.ac.nz

Auckland Robyn Headifen Phone: 027 250 3009 E: TBC

Waikato, BOP Appointment pending

**Manawatu, Taranaki, Hawkes Bay Appointment pending**

**Wellington, Wairarapa Appointment pending**

**Nelson, Marlborough, West Coast Appointment pending**

Canterbury, Aoraki Appointment pending

Otago, Southland Appointment pending

NZAMT Contact nzamt admin admin@nzamt.org.nz nzamt secretary secretary@nzamt.org.nz

National Newsletter: Network of Expertise: Mathematics and Statistics Term 4 2018

PSTC NZAMT and facilitators recognise that one-off workshops are not an effective method of PLD for developing capability and sustainability. However, these

The inaugural Primary School do provide teachers an opportunity to get together, connect, share ideas and

Teachers Conference is being work with facilitator(s) on a range of aspects relevant to their teaching

held in the first week of the April practice. Thus, the proposed PLD includes:

school break, 15th – 16th April,

• both workshops and online resource material

2019 in Wellington.

• as well as funding for our respective associations to offer on-going

Theme: support, advice and guidance

• developing teacher capacity, with an overall aim of strengthening teacher practice in curriculum, pedagogy and assessment in Mathematics and Statistics

Integrated learning and collaborative teaching in the 21st century.

• Approximately 65 professional development workshops over The Proposed Actions

the two days

• Motivational keynote speakers

· Workshops to be held

· Generalist primary teacher audience/teachers with an interest

- Weaving learning into aspects of literacy and numeracy - Reflecting on the NMSSA findings and making connections to other

programmes of learning

and outstanding, innovative presenters

• Networking, sharing good practice, - Digital fluency

collaborative learning, being - Coherent, connected and responsive programme planning

inspired - Consulting with the community - Working in partnership with appropriate outside providers to enhance

programmes of learning - Looking at the Mathematics and Statistics learning progressions and

implications for primary, intermediate and secondary programmes - NCEA Levels 1, 2, 3 and Scholarship

• and having fun! Website: www.nzptc.com Contact: admin@nzptc.com Twitter: @NzPrimary Facebook: nzpstconference

**· Support aims to primarily provide teachers with on-going advice and guidance to build capability and adaptive expertise in each subject may**

**Registration costs (Incl GST) include such activities as:**

· Relationship building and maintenance with interested parties (MoE, NZQA, ERO, other subject associations etc,.)

· Enhance online presence (e.g. forums/webinars/social media networks through platforms to be investigated as a best fit for purpose)

Early bird registration - $380 Ends 15th February 2019 Standard registration - $450 Ends 1st March 2019

· Email, telephone, face-to-face or web support for advice and guidance

Late registration - $590 around pedagogy, curriculum and assessment

Ends 15th March 2019

· Specific (but limited) in-school support for schools demonstrating high level

(Includes two days of of needs to improve outcomes for learners

· Develop resources identified as needed

conference & progressive dinner)

· Provide a regular newsletter with updates pertinent to the subject

· Strengthening teaching as inquiry, student and teacher agency, community

**Subject sponsors:**

consultation, digital fluency, and culturally responsive programme planning, teaching and learning underpinned by such MoE, Education Council documents as Tātaiako, NZC, Standards, Code of Ethics for practising teachers.

National Mathematics and Statistics Survey Please complete the Mathematics & Statistics NoE National Survey – due for release late October, 2018. This is important for crafting future National Regional and Local PLD Workshops and support is tailored to meet the needs of Y1 – 13 teachers. NZAMT are currently designing three Google forms to find out what particular support across the country is required by teachers, for teachers to support their personal growth in content, pedagogy, assessment etc., to develop programs that support the requests. The surveys are scheduled for release at the end of October and targets Y1-6, Y7-10 and Y11-13 teachers. An email with the links will be shared via NZAMT email lists and through regional facilitators so that the survey reaches out to as many teachers as possible. Look out for an email regarding the ‘Mathematics & Statistics Network of Expertise National Survey’ later this month.

Education Counts Public Achievement Information (PAI), a collection of infographics that summarise a wide range of education topics. The aim of the graphics is to

The Network of Expertise initiative is funded by the Ministry of Education. NZAMT Contact: P O Box 26-582, Epsom, Auckland, http://www.nzamt.org.nz 2

National Newsletter: Network of Expertise: Mathematics and Statistics Term 4 2018

NZAMT16 Conference help explain complex topics, and provide a better understanding of New Zealand’s education system. The New Zealand Education Profile provides key statistics from early childhood education through to 18 years of age. By looking at the Profile you can see the progress being made against important measures such as participation in Early Childhood Education, National Standards and Ngā Whanaketanga Rumaki Māori progress and achievement, and the percentage of students gaining key NCEA qualifications by the time they leave school, at a national and regional level. It also shows where there are issues of inequity, and therefore what improvements are needed across the education system. http://www.educationcounts.govt.nz/topics/national-education Analysing regional and local data allows school communities to:

• initiate education discussions

• support the achievement of students within regional boundaries

• formulate partnerships with other regionally/locally based stakeholders to address barriers to achievement

• develop local solutions to local problems

• identify which investments and supports are effective in raising student achievement, and which are not. Statistics: http://www.educationcounts.govt.nz/statistics Publications: http://www.educationcounts.govt.nz/publications Indicators: http://www.educationcounts.govt.nz/indicators Public Achievement Indicators: https://www.educationcounts.govt.nz/topics/pai Poster Links: https://tinyurl.com/yd7enlmn https://www.educationcounts.govt.nz/topics/pai/regionals-education NCEA Level 2+ https://www.educationcounts.govt.nz/statistics/schooling/senior-student- attainment/school-leavers2/ncea-level-2-or-above-numbers

The Biannual NZAMT conference is being hosted be the Wellington Mathematics Association. The conference has the whakatauki: ‘Kia toi toi manawa te nga ki te mahi whakaako ko pangarau ko tetauranga’ Translated, this whakatauki seekto encourage the joyful art of mathematics and statistics teaching. The four day conference (1st – 4th October, 2019) is to include plenaries (both national and international speakers), teacher lead workshops and workshops that take participants into the workplaces in and around the Hutt Valley to see mathematics and statistics in action. The conference is being designed to cater for primary, intermediate and secondary teachers. Based in the grounds and surrounds of Hutt Valley High School the conference is continuing the journey of NZAMT conferences to support, invigorate, inspire teachers in research developments, new ideas in crafting the art of teaching and relating the subject to the real world. Term 4 2018 and a potential branch of PLD 2019 In the first and second week of the October school break a number of Primary, Intermediate and Secondary teachers had the opportunity to ‘taste’ either a one day workshop or a 3 day residential experience of MathsCraft. Delivered by Anthony Harradine (PAC, Adelaide) and Dr Anita Ponsaing

The website is live and being made functional to be ready to accept abstracts of workshops, teacher registrations and sharing the programme.

(Melbourne, Melbourne University Outreach Research Mathematician). This programme over the last few years has been spreading across the east coast of Australia. NZAMT under the umbrella of the Network of Expertise (NoE)

Website: https://nzamt16- dev.wma.org.nz

invited the two Australians to share their programme with over 100 teachers across Aotearoa. This programmes weblink, https://acems.org.au/mathscraft, states that it is to help students and their teachers answer those questions, ACEMS sponsors this program now called "MathsCraft - Doing maths like a research mathematician." The goal of the program is for students and teachers to experience what we believe mathematics is truly about: exploring, noticing patterns, making conjectures, proving or disproving those conjectures, figuring out “why”, thinking of ways to extend the problem. The teachers who attended will share what they experienced with workshops in their schools firstly, then there will be workshops in regions to develop a MathsCraft community.

The Network of Expertise initiative is funded by the Ministry of Education. NZAMT Contact: P O Box 26-582, Epsom, Auckland, http://www.nzamt.org.nz 3

National Newsletter: Network of Expertise: Mathematics and Statistics Term 4 2018

NCEA Review Levels 1, 2 & 3 All of the 42 Internal Levels 1, 2 and 3 Achievement Standards, have been peer reviewed. NZQA are in the process of addressing issues raised from this process. Some things to remember when assessing the statistical standards:

• Students needs to link their research to their investigation. For example, how distraction affects memory, students need to find relevant research to either support or contradict their question.

• For 91035, 91264 and 91582, students need to identify the actual population in their question and inference as these standards are about making a sample to population inference.

Magic Squares and Geometrical Patterns Magic Squares are square grids with a special arrangement of numbers in them. These numbers are special because every row, column and diagonal adds up to the same number. For the example below, 15 is the magic number in this 3×3 grid.

Could you work this out just from knowing that the square uses the numbers from 1 to 9? https://nrich.maths.org/2476 In a 4×4 grid the square uses the numbers from 1 to 16. Here every row, column and diagonal adds up to the same number, 34. One example is illustrated below in four different orientations.

BUT, there are a number of other combinations of 4 sets of squares within the magic square having a sum of 34. For example:

Can you and your class find other geometrical patterns in the 4×4 magic square, where the sum of the four connected numbers add to 34?

Nga mihi rā Derek Smith National Kaiarahi for Networks of Expertise - Mathematics and Statistics P: 027 460 2871 E: kaiarahi@nzamt.org.nz

The Network of Expertise initiative is funded by the Ministry of Education. NZAMT Contact: P O Box 26-582, Epsom, Auckland, http://www.nzamt.org.nz 4

Links to:

The latest report from NMSSA on Y4 and Y8 student progress in Mathematics and Statistics http://nmssa.otago.ac.nz/reports /NMSSA-Maths-and-Statistics- 2013.pdf

Building genuine learning partnerships with parents is an ERO report which shares strategies and approaches from schools that had contributed to improving achievement by developing genuine learning partnerships with parents. http://www.ero.govt.nz/publicati ons/

Tapasā is a resource for all teachers of Pasific learners. It is designed to support teachers to become culturally aware, confident and competent when engaging with Pacific learners, their parents, families and communities. http://www.elearning.tki.org.nz/ News/Tapasa-Cultural- Competencies-Framework-for- Teachers-of-Pacific-Learners