

# National Newsletter: Mathematics and Statistics

Information and resources for middle leaders in secondary schools | Term 2 2014

## Whakatauki

Kia mahia tatau tahi ma te paiinga a a tatau tamariki.  
May we all work together for the good of our children.

## Welcome

We hope that you have been relaxing over the Easter, ANZAC term 1 – 2 break. This newsletter is packed with information for the mathematics and statistics teaching community. Please circulate around your department (faculty).

## National workshop programme - term 2

The target audience for this year's free national workshop programme is middle leaders/teachers in charge of mathematics and statistics.

Overview:

- Inquiry process and next steps to linking to appraisal and RTCs.
- Youth Guarantee, Vocational Pathways and financial literacy - cross-curricular tasks.
- Junior programmes and back mapping, National Standards, contributing schools and transitioning students.
- Literacy within mathematics and statistics.
- NCEA L1, 2 and 3 updates.
- Tracking priority learners.
- Differentiation in the mathematics and statistics classroom.

Whangarei 29 May	North Shore 21 May	Auckland 22 May
Sth Auckland 20 May	Hamilton 13 May	Rotorua 14 May
Napier 15 May	N Plymouth 13 May	Palmerston Nth 15 May
Masterton 12 May	Wellington 13 May	Nelson 15 May
Christchurch 14 May	Dunedin 27 May	Invercargill 29 May

## Mathematics education course from Stanford

**How to Learn Math For Teachers and Parents.** Starts in **June**. The course is highly recommended for mathematics teachers. A small fee is being charged in 2014. Set up a Faculty discussion group and have all teachers participate. Typically 30 to 60 minutes per session, a talk, some video and reflective questions, no major essays or productions. Joe Boaler coordinates the course. Visit: <http://scpd.stanford.edu/instanford/how-to-learn-math.jsp>

## Royal Society teacher fellowships

An opportunity to look at the [Teaching-learning-fellowships](#) and if interested the [endeavour-teacher-fellowships](#) applications for 2014/2015.

## Khan Academy

These are videos on mathematical content. Below are links to view some:

[Use a simulation to test a theory](#)

[What happens when you mixed, green, and blue light?](#)

## Contact details

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## Numeracy and literacy progressions

A reminder that the numeracy and literacy unit standards are linked to the adult progressions, Koru level 5: Click this [link](#) and on the following, [literacy for adults](#) and [numeracy for adults](#) for more information.

## TKI, NZQA, nzmaths, C@S, Statistics NZ, NZAMT

Register for these updates via RSS feeds or add to your favourites:

TKI <a href="http://www.tki.org.nz">www.tki.org.nz</a>	NZQA <a href="http://www.nzqa.govt.nz">www.nzqa.govt.nz</a>
NZAMT <a href="http://www.nzamt.org.nz">www.nzamt.org.nz</a>	nzmaths <a href="http://www.nzmaths.co.nz">www.nzmaths.co.nz</a>
C@S <a href="http://new.censusatschool.org.nz/">http://new.censusatschool.org.nz/</a>	Statistics NZ <a href="#">Census 2013</a>

**nzmaths updates:** A series of modules has been developed to help teachers work with the National Standards with illustrations in mathematics.

<http://www.nzmaths.co.nz/ns-modules/>

**Statistics New Zealand update:** NZ in Profile 2014. Could be used to create some interesting lesson plans.

[http://www.stats.govt.nz/browse\\_for\\_stats/snapshots-of-nz/nz-in-profile-2014.aspx](http://www.stats.govt.nz/browse_for_stats/snapshots-of-nz/nz-in-profile-2014.aspx)

## Free Apps

1. Occupation Outlook 2014 has launched a free mobile App that can be downloaded at the iTunes store. The App provides instant and easy access to the latest career information and is designed to help students, and their families, make well-informed career choices.  
The free app provides instant New Zealand-specific information on the likely incomes, qualification options and costs, and job prospects for 50 key occupations, compiled from the annual Occupation Outlook report, which is aligned to the Vocational Pathways. [Download the free app here](#)
2. An on-line calculator – does 3D graphs also  
[http://hotmath.com/learning\\_activities/interactivities/3dsystems.swf](http://hotmath.com/learning_activities/interactivities/3dsystems.swf)

## Background to teaching and learning strategies

Analysis of students' language and learning needs

[Analysis of constraints and strategies to cope with the constraints](#)

Setting of language and content objectives

Programme and lesson planning

## Reminders around student work from moderation

We are assuming that this year will see a consolidation of clarifications on NCEA Level 3 standards so that teachers are well informed to the requirements of each Achievement Standard.

Use cover sheets and assessors not to write on the student work.

Electronic entry to moderators will be accepted e.g. from a drop box or google drive. Remember to record conversations with students in a resubmission, to their work that is submitted, for moderation – the moderators are not mindreaders.

## Vocational profiles via their NZQA ROA

All learners have access to their Vocational Profile, which maps their learning achievement against the Vocational Pathways. Learners need to login to their [user-page](#) to obtain their Vocational Profile. They can use their Vocational Profile to inform their career planning and/or studies and future employers about achieving NCEA Level 2 and a Vocational Pathway(s). A formal award for achieving a Vocational Pathway will be available in June 2014. For more information visit <http://www.youthguarantee.net.nz/>

## VP resources for schools and education providers

There are a range of resources for developing contextualised learning programmes using the Vocational Pathways. They include:

- Updated 2014 standards
- Programme design guidance resources

## Resources and weblinks

### 2014 PLD links

- [Secondary-Professional learning and development](#)
- [Middle leader News](#)
- [System-of-support-incl.-PLD](#)
- [E-newsletters](#)
- [Tataiako](#)
- [Education counts](#)
- [ESOL-Online](#)

### 2015 PLD links

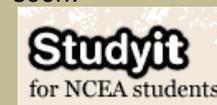
#### NZAMT14 conference

When: Tue 7 July – Fri 10 July 2015

Where: AUT University, Wellesley Street East, Auckland

### Newsflash:

Studyit will be online again soon.

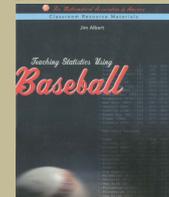


<http://www.studyit.org.nz/>

## Reading material

### Teaching Statistics using Baseball - Jim Albert

Teaching-Statistics-Using-Baseball



Has some interesting exercises and case studies that can be used to develop units of work - case studies and exercises which apply statistical and probabilistic ideas.

### Statistics in the Workplace – John Harraway and Richard Barker

[Harraway\\_Barker.pdf](#)

A postal survey was conducted regarding statistical techniques, research methods and software used in the workplace by 913 graduates with PhD and Masters degrees in the biological sciences, psychology, business, economics, and statistics.

- Assessment resources
- Profile Builder – planning a pathway
- Occupation Outlook 2014 – free app and PDF
- Visit [www.youthguarantee.net.nz](http://www.youthguarantee.net.nz) for more information.

## NZQA

Here is the link with information NZQA best practice workshops:  
[best-practice-workshops](#)

Subject / Location	WHANGAREI	AUCKLAND	WELLINGTON	MANUKAU
Mathematics	22-May	18-Sep	14-Aug	28-Aug
Statistics	23-May	19-Sep	15-Aug	29-Aug
Subject / Location	HAMILTON	CHRISTCHURCH	DUNEDIN	
Mathematics	19-Jun	18-Sep	15-May	
Statistics	20-Jun	19-Sep	16-May	

Please make sure you register well in advance (>3 weeks) as there needs to be at least 18 attendees for these workshops to run. There have been a number of BPWs cancelled due to not enough or too late entries. All notifications are now sent via Facebook: Mathematics & Statistics NZQA - Like this page: [Mathematics-and-Statistics-NZQA](#)

Clarifications and Newsletters are posted on the NZQA website  
<http://www.nzqa.govt.nz/qualifications-standards/qualifications/ncea/subjects/mathematics/levels/>

<b>Mathematics and Statistics</b> <a href="#">Mathematics level 1</a> <a href="#">Mathematics level 2</a> <a href="#">Mathematics level 3</a>	<b>Past Examination papers</b> <a href="#">Mathematics level 1</a> <a href="#">Mathematics level 2</a> <a href="#">Mathematics level 3</a>
<b>Assessment specification</b> <a href="#">Mathematics level 1</a> <a href="#">Mathematics level 2</a> <a href="#">Mathematics level 3</a>	<b>Assessment Schedules &amp; Judgement Statements</b> <a href="#">Mathematics level 1</a> <a href="#">Mathematics level 2</a> <a href="#">Mathematics level 3</a>
<b>Assessment reports</b> <a href="#">Mathematics level 1</a> <a href="#">Mathematics level 2</a> <a href="#">Mathematics level 3</a>	<b>Numeracy</b> <a href="#">Numeracy Moderator Newsletter</a> <a href="#">Clarifications on Literacy/Numeracy</a>

## Mathematics and statistics facilitators' website

Recent additions include a list of Level 3 Standards and the Clarifications.

[Level 3 Achievement Standards with specifications.](#)

The fifteen L3 Achievement Standards 'big picture' revised by the facilitators:

[Level 3 'Big picture'](#)

Please note that this site was set up to assist with the realignment of NCEA-NZC. The website will not be updated/added to in 2014.

## Questionnaire design Level 2

The use of Survey Monkey in the design of questionnaires in teaching programmes. There are vignettes on survey design and it is free if you (students) keep questions to < 10 (including parts). There is also limited access to reporting facilities where reports of results can be in comment form, collated into 2-way tables, basic Bar graphs for example. More information can be viewed at [surveymonkey](#)

A vignette example can be viewed at: [survey-makeover](#)

## Ruia - teacher appraisal tool

Ruia is part of a suite of initiatives designed to support leaders to improve outcomes for their Māori students. These tools have been designed to support better educational success for Māori students and provide in-depth resources in appraisal for learning and school-whānau partnerships.

See for an overview: <http://appraisal.ruia.educationalleaders.govt.nz/>

Specific links to the details:

- [Reviewing appraisal in your school](#)

## A reminder on Level 1 and 3 statistics inference achievement standards:

### 91036 Investigate bivariate numerical data using the statistical enquiry cycle - Managing sources of variation - Explanatory Note 3 - managing sources of variation

Variation of measurements occurs in all experimental situations. The student needs to identify possible sources of variation and the actions that they have taken to manage the sources of variation that they have identified.

For Achieved it is acceptable for teachers to annotate student work if they have observed a student manage variation during the data collection process, but it is not clear they have done so in the student's response.

For Merit and Excellence the students need to discuss managing variation in their response. This step up to Merit and Excellence is not that they have discussed variation, but the justification and statistical insight in their discussion.

### 91264 Use statistical methods to make an inference, and 91582 Use statistical methods to make a formal inference - Explanatory Note 3 - The discussing sampling variability, including the variability of estimates

At all levels of achievement students need to show an understanding of sampling variability and the variability of estimates.

For example, another sample will give a different median and an informal or bootstrapped confidence interval, but the confidence intervals from the different samples are all likely to capture the population median.

The step up from Achieved to Merit and from Merit to Excellence will be evident in the improved quality of the response with respect to the different levels of thinking for the standard.

- [An inquiry and knowledge-building cycle for appraisal](#)
- [An appraisal planner](#)

## Youth Guarantee and Vocational Pathways

The profile builder on the website allows a student to enter their achievement standards in all subject areas to be recorded and shows how these relate to the six broad employment sectors. Information about jobs within sectors can then be explored.

Teachers can also use this tool to check the focus of mathematics courses. There is an expectation that courses suit student aspirations.

See: [/start-your-journey](#) and [ero - Report](#)

NZQA quality assured resources support internally assessed Level 1 and 2 registered achievement standards for the Vocational Pathways:

[Level-1-Mathematics-and-statistics](#) and [Level-2-Mathematics-and-statistics](#)

TKI resources include NZQA quality assured assessment resources to support internally assessed Level 1 and 2 registered achievement standards for Vocational Pathways:

[Level-1-Mathematics-and-statistics](#)      [Level-2-Mathematics-and-statistics](#)

## NZAMT

There is a new format for the association membership as indicated by the executive at the NZAMT13 conference. School registration includes individual resources. To see the resources available to registered schools, hit this link [NZAMT here](#).

To gain access to these resources you must be registered with NZAMT. Please do not place any NZAMT secure tasks on your school's Intranet as this could breach the rules around secure tasks and the agreement you as your school's representative has made with NZAMT.

<a href="#">2013 NZAMT Conference Resources</a>	<a href="#">Statistics 2013 Photo Contest</a>
<a href="#">2013 Beven Werry Speaker - Dillon Mayhew</a>	<a href="#">Facebook Page for NZAMT</a>

## From the facilitators' notebook

Comments regarding Teaching as Inquiry:

"I found that nearly all the students I investigated were into basketball, so maybe I can use this as a context in class."

"Most of the students I investigated speak more than one language and for those that do, English is not the language of use at home. So they may need help with literacy at school."

"The caregivers of my students care more than you would imagine. It is up to us to make more contact with them."

Other comments received:

- For the Statistics Standards, no research is expected at Level 1 - the research is given at Level 2 and at Level 3 the research drives the question.
- The Conditions of Assessment clearly states... technology is expected to be used and in the Statistics Standards this includes statistical packages.
- Assessments should not be time restricted.
- In the statistics assessments students should visualise before they mathematise.
- Merit is NOT 'achieve +' and excellence is NOT 'merit +'
- Annotate the student work why a particular grade was given, especially if it is considered to be on a grade boundary.

"With the Teaching as Inquiry which I did last year although I was focusing on 6 students in one class, I became more aware of ALL students as the TaI gained momentum in all my classes."

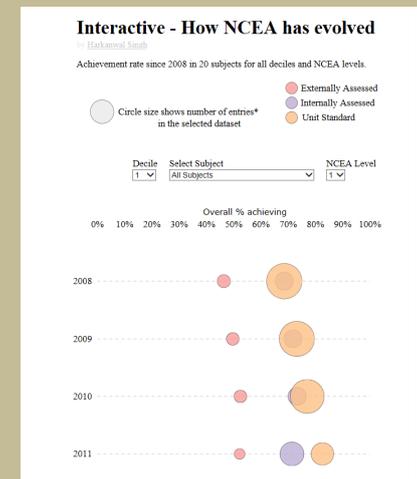
## Futureintech

For online booking for an Ambassador to visit your school: [Request ambassador](#) . For further information contact Susan Weekes, Futureintech Facilitator: [www.futureintech.org.nz](http://www.futureintech.org.nz)

## Interactive graphic: NCEA - internal vs external

The NZ Herald online analysis shows how students do in internal and external assessment.

[http://www.nzherald.co.nz/nz/news/article.cfm?c\\_id=1&objectid=11207352](http://www.nzherald.co.nz/nz/news/article.cfm?c_id=1&objectid=11207352)



Vary the:

- Decile
- Subject
- NCEA level

## 10 steps to effective pedagogy in Mathematics

1. An ethic of care
2. Arranging for learning
3. Building on students' thinking
4. Worthwhile mathematical tasks
5. Making connections
6. Assessment for learning
7. Mathematical Communication
8. Mathematical language
9. Tools and representations
10. Teacher knowledge

Sources:

<https://www.educationcounts.govt.nz/topics/bes/bes-programme>

and

[http://www.ibe.unesco.org/fileadmin/user\\_upload/Publications/Educational\\_Practices/EdPractice\\_s\\_19.pdf](http://www.ibe.unesco.org/fileadmin/user_upload/Publications/Educational_Practices/EdPractice_s_19.pdf)