MINISTRY OF EDUCATION
Te Tāhuhu o te Mātauranga

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National Newsletter: All Sciences including Agricultural and Horticultural Science

Information and resources for middle leaders in secondary schools | Term 3 2014

Tena koe, Greetings to you all, Kia orana, Fakaalofa lahi atu, Malo e lelei, Talofa lava, Talofa ni. Welcome to the term 3 national newsletter.

Completing our national workshops for 2014

We have delivered almost all our national workshops but there still are two further workshops to be held in the North Island. The themes are Exploring Nature of Science; Science Capabilities; Literacy in Science; Scientific Literacy. This workshop focuses on developing junior science programmes that engage students leading to improved success for all. It targets Science middle leaders and teachers in charge of Science in years 9-10 (and years 7-8 in secondary schools with those year levels).

These two workshops will run from 9am – 3pm and are free, as they are supported by the Ministry of Education as part of the Secondary Student Achievement PLD.

Napier, 12 August
R101, EIT, Gloucester St, Taradale
Please register for the Napier workshop at:
https://intranet.teamsolutions.ac.nz/forms/index.php/forms/workshop_enrolment/KRTS46

Gisborne, 19 August
PR102, EIT, Palmerston Road, Gisborne
Please register for the Gisborne workshop at:
https://intranet.teamsolutions.ac.nz/forms/index.php/forms/workshop_enrolment/KRTS47

Programme design - using contexts to promote student learning success

Following last term's newsletter, the Science facilitators have come across some great examples of learning contexts being used in Year 11 Science.

One boys' school with a large number of Pasifika students is using the students' stated love of music to develop an understanding of waves. They want to get the boys to make a bamboo flute, working out where to put the holes. A work in progress. A girls' school is in the process of developing a unit on microbes in the context of a hairdressing salon.

Secondary Student Achievement PLD

This national newsletter is produced by the National Co-ordinators as part of the Secondary Student Achievement PLD. The Secondary Student Achievement professional development is funded by the Ministry of Education. The Government goal is that 85% of all 18-year-olds will have achieved NCEA Level 2 or an equivalent qualification by 2017.

Support is available to all middle leaders in the form of workshops/clusters and e-newsletters in every learning area and in a range of subjects. Intensive, in-depth support is also being provided for selected schools or departments allocated by regional Ministry offices.

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e-Learning in Science

Last year NZCER published a discussion document *Digital technologies and future-oriented science education*, to get teachers and schools to think about the bigger picture of what e-in-science means: http://scienceonline.tki.org.nz/New-resources-to-support-science-education

A key idea behind this report was that science education needs to be relevant and engaging for learners, whatever their age. It also needs to reflect the complexity of contemporary science.

Traditionally we have taught science as a body of knowledge that students need to understand. However in today's world the "content, volume and accessibility" of this knowledge increase enormously on a daily basis. An emphasis on acquiring knowledge is not enough; students need more complex skills in dealing with information, in communication and in thinking. Many of the global problems we have to grapple with are socio-scientific issues; they have a science basis at their core – global warming, loss of biodiversity, fracking – and so as adults our students will need the skills to make decisions based on their science understanding.

The scientists' world has changed too, from one where they worked on their own interests by themselves, to the 20th Century where they worked in teams based in universities (on their interests) or in industry (on commercially driven projects) - and in the 21st Century, where they work in large teams, networked across several institutions and countries, on large-scale, multidisciplinary, muti-method projects. Gilbert says, "The influence of this kind of post-academic science - what it is, how it is done, and importantly, the skills and knowledge it takes to be successful in it - is not yet evident in school science." (Gilbert, 2012, p.6).

Doing more of what we do now will not be enough for our students. A growing proportion of our students are disengaged with our subject, seeing it as irrelevant or boring. One way to engage them is to give students more say in decisions about their learning. Of course there will be some decisions that only teachers can make; that is what their training is for. However, if we design learning experiences that are connected to students' knowledge, experiences and interests and give them choices where it is appropriate, we can increase engagement hugely. To meet student needs in the knowledge age we also need to engage with contemporary scientific practice, so students see science as complex, collaborative and addressing real-world questions.

NZCER proposes closer connections between schools and science communities.

Update on cluster workshops

This year we have been also supporting a number of schools across the country through a series of targeted cluster workshops. In collaboration with the Ministry of Education, inquiry clusters have been established across the country involving around 80 schools This PLD supports schools to become more confident in developing Science programmes at Year 11 with a Nature of Science focus, working with schools as they developed more effective pedagogical approaches to engage all learners and address their inherent literacy and numeracy needs. Therefore, the cluster workshops focus on:

- Building literacy capability.
- Developing appropriate assessment tasks.
- Building effective pedagogical practices for learners.

Teaching as Inquiry has been introduced as a way for participants to monitor the impact of their teaching on the learning of a target group of students. Several teachers are reporting successes, saying students are enjoying the challenge and starting to access more complex readings. A major outcome has been a shift away from the use of unit standards towards more achievement standards at Year 11.

Science subject area alerts

First up, a reminder to check out the Assessment Specifications and Clarifications provided by moderators on both TKI and the NZQA site before using a task in 2014.

Clarifications have recently been posted (June or July) for L1 and L3 Biology, L1 Chemistry, L1 Physics and L1 Science.

Unpacking the standards

We are still coming across a number of teachers who do not realise that, including the standard, 3 documents need to be referred to when writing a task.

Mike Stone has combined information from all 3 onto one page for each of the investigation standards (including 90155 ESS investigation). Feel free to email Mike if you would like a copy of these 'unpacked standards' - m.stone@auckland.ac.nz

Reflecting on SCICON

A few brief thoughts from Mike Stone:

I thoroughly enjoyed SCICON in the chilly depths of Dunedin this year. Some key highlights for me were:

Bill McComas, a Nature of Science (NoS) guru from USA, speaking on Nature of Science and his pet subject, the myths we often hold about science.

Athol Hockey, teacher from New Plymouth Girls' High School, who brought a guitar along to share songs he uses in his teaching. Loved the DNA song, among other revamped tunes from the 60's!

Terry Burrell, HoD Onslow College, showing us a very "NoSsy" unit on climate change she developed with her year 10 students.