



Newsletter No.3

May 2001

Hi everyone. In this is our third nzmaths web site newsletter we have a contribution from Bruce Moody. Bruce was a secondary teacher before working as the Secondary Maths Adviser in the Waikato/Wairariki region. He is currently employed by the Ministry of Education for a special project aimed at improving numeracy in the Rotorua area. We'd like to hear your comments on what he has to say. Or you may like to discuss other aspects of maths at the primary level. We are keen to hear what you have to say.

One important item this month is an advert for the New Zealand Science, Mathematics and Technology Teacher Fellowships that are administered by the Royal Society. If you have a project that you are keen to pursue, then get an application form from Allison Taranchokov. If you are not sure whether the project you are interested in is appropriate, then get in touch with Peter Spratt and get his advice.

While we think about it, there was one aspect of exemplars that we forgot to mention in last month's newsletter. You can get more information on the web site http://www.edgazette.govt.nz/articles/show_articles.cgi?id=5926.

Once again this month we have an article on the NZAMT (New Zealand Association of Mathematics Teachers) conference in Wellington in July. There will be plenty of worthwhile things here for teachers at all levels. Especially if you live in the Wellington area, you should get along to at least one day.

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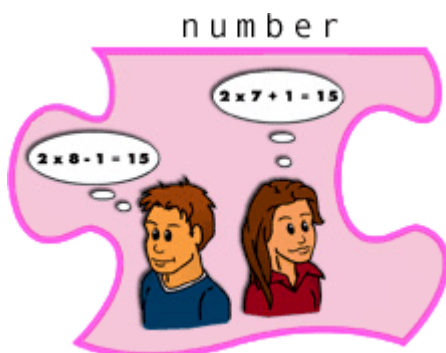
Problem of the month

WHAT'S NEW ON NZMATHS.CO.NZ?



Problem Solving: This month we have added the following lessons to the Problem Solving section of the site:

Lesson	Strand	Level
Little Magic Squares	Number	2
Big Magic Squares	Number	3
Decimal Magic Squares	Number	3
Negative Magic Squares	Number	4
Fractional Magic Square	Number	4
The Magic Square	Number	5
Difference Magic Squares	Number	6
Jim's Table	Algebra	1
Jo's Table	Algebra	2
Sarah's Table	Algebra	3



Number: Watch this space. We are currently working on the units and maintenance activities for number. We plan to start adding these to the site in June.

Web Statistics: In each newsletter we include some statistics from the previous month. In April:

There were 7,161 distinct users. A distinct site is either a single computer or a school connecting to the website. A user is only counted once per month, regardless of how many times they come back to the site.

The most popular unit of work was “Foil Fun” (Geometry, Level 1) with 5% of visitors to the site downloading it.

There were 72,481 pages of information downloaded. This is 938 megabytes of information.

READER'S CONTRIBUTION

WHAT'S THE POINT • ? BY BRUCE MOODY

As part of a series of interviews with students, a card similar to the one on the right was placed in front of each person. The first question was, "Can you read me that number please?" Once this question has been answered, the second card was placed beside the first and the student asked, "Which of these two numbers is the larger?"

0.75

There was a high correlation between students answering "zero/nought point seventy-five" in response to the first question and believing that this was larger than 0.8 ($75 > 8$)

0.8

There is a significant number of Year 9 students who have this misconception, and I believe that this is one contributing factor to their unease when working with decimals in all areas of the curriculum.

I wonder if one of the reasons for this confusion arises from the common practice of using money as the main context for decimals in classrooms. Although we *call* our currency a decimal system, the reality is that we treat it as two whole number systems that abut at the decimal point.

Read this price out loud: \$**1.75**.

Are you one of the 'normal' people on Earth who say "a dollar seventy five"?

Take away the \$ sign, and we want children to say something quite different. There is a clash between the context of money and the teacher-presented view of decimals. No wonder the student has trouble constructing meaning here!

Becoming aware of the problem is the first step in addressing it. The use of alternative contexts - those from measurement for example - will be one part of a study taking place in some Rotorua schools this year. The aim is to find strategies that will reduce the number of students who 'do decimals' annually from Year 5 up and still do not master this Level 3 Achievement Objective.

INFORMATION SECTION – TEACHER FELLOWSHIPS

You may not have thought about applying for a Teacher Fellowship. Read the advertisement below and then get in touch with Allison at the Royal Society. If you get a Fellowship, we're sure that you'll have a stimulating year.



New Zealand Science, Mathematics and Technology Teacher Fellowships

Administered by the Royal Society of New Zealand

Applications are invited from

Primary, Intermediate and Secondary teachers

**If you teach science, mathematics, technology, or the social sciences
you can apply.**

Fran, a primary teacher, spent her year learning about science and technology in a Maori context. She also helped DOC in their Stitchbird recovery programme on Mokoia Island, learnt about the geothermal system of Rotorua, improved her computer skills and developed her Te Reo. She says, "I am eagerly looking forward to returning to school with a basketful of new ideas and renewed enthusiasm"



Marilyn teaches Year 2 – 4 students and has a particular interest in technology education and art. She spent her fellowship year with the Institution of Professional Engineers New Zealand (IPENZ) in their National Office in Wellington. She had the opportunity to observe technological practices in the business community and develop her own understandings of technology. Apart from spending time on a building site (complete with a hard hat), Marilyn was able to organize teacher/engineer links, gave presentations and promoted the IPENZ Neighbourhood Engineers programme. In addition she developed a range of personal IT skills, attended a wind energy conference and established links between engineers and the National Association of Women

in Construction.

Closing date for Applications is Friday 27 July 2001

For further information, contact Allison Taranchokov at:
The Royal Society of New Zealand, PO Box 598, Wellington
Tel: 04 470-5764 Fax: 04 473-1841

Email: taranchokov.a@rsnz.govt.nz

Website: http://www.rsnz.govt.nz/awards/teacher_fellowships

PROFILE OF THE MONTH: PETER SPRATT AND ALLISON TARANCHOKOV - THE ROYAL SOCIETY CONNECTION

Peter. With almost twenty years of teaching experience in secondary and Form 1-7 schools and three years as a Science Advisor, Peter Spratt joined the Society in 1994 taking responsibility for the education area. Since his appointment, the education area has increased until there is now a team of seven working on activities ranging from Science and Technology Fairs, CREST awards, and the National Waterways project to working for the science and technology teacher associations, resource production and general advocacy for sciences, mathematics, technology and social sciences education. He sees the Society making a major contribution to science, mathematics, technology and social science education and promotion by advocating for and demonstrating collaborative and cooperative approaches so that students and teachers are supported and gain maximum benefit. As an example, he'd like to see students who carry out investigations in science, mathematics or social sciences entering their work into the Science and Technology Fairs as well as gaining credit for it through the CREST Awards. Gone are the days of a different piece of work for different programmes. Another of these approaches is through the Science Mathematics and Technology Teacher Fellowships which allow teachers to experience research or technological practice in an area of their interest while at the same time having the opportunity to reflect on their teaching practice and develop their understandings and skills.

Peter lives on a large section a little out of Wellington with Berys who is a primary teacher and their dog Maggie. Their three daughters have left home with one presently in London, one working as a lawyer and the third having returned to university after nursing in NZ for two years and then three years overseas working and travelling. Relaxation usually takes the form of working in the garden, reading or tramping.

Allison. Allison Taranchokov returned to work at the Society from raising a family and joined the education team in July 1998. Allison has previously worked at DSIR and as a legal secretary, and so her administrative knowledge and skills are of great value. As well as providing general support, Allison administers both the NZ Science, Mathematics and Technology Teacher Fellowship scheme and the Science and Technology Contestable Promotion Fund, which provides grants to organisations such as science centres, museums and other organisations to promote science and technology.

Allison has a family of three primary aged children who lead active lives, with horse riding being a strong interest for herself and her daughter. Allison enjoys a challenge.

COMING EVENTS: THE NZAMT CONFERENCE

NZAMT 7 Conference

Primary Focus

Wellington 2001: A Maths Odyssey happens in the July holidays. The keynote addresses at the conference will appeal to a wide audience. (Some information about the keynote speakers appeared in the April newsletter.)

Workshops of particular interest to primary teachers include workshops with titles like these:

- Hands-on Hundreds Boards
- Numeracy
- Working with National Curriculum Mathematics
- Exciting Ideas to Celebrate Maths Week
- Homework – a view from abroad
- Using literature to launch a maths investigation

While these workshops specifically target the learning needs of Years 1-8 students, the workshops are also likely to be of interest to those working in the Early Childhood and Secondary areas.

Wellington – Top Town!

Another feature of the conference will be that we take every opportunity to show off our wonderful city! While the centrally-located Duxton Hotel will provide a very comfortable base for the conference, events will also be held at Parliament, Te Papa, and the Museum of City and Sea. We are delighted to have our Deputy Mayor, Kerry Prendergast, speaking at the opening of the conference.

So – see you in July!

SOLUTIONS OF THE MONTH

Once again we have had no response to any of the problems. But undeterred we produce a new one this month. First, however, we give the solutions to last month's problems.

PART 1: Arrange 8 coins as we have done below. Now move just 4 coins to make a square that has 4 coins on each side

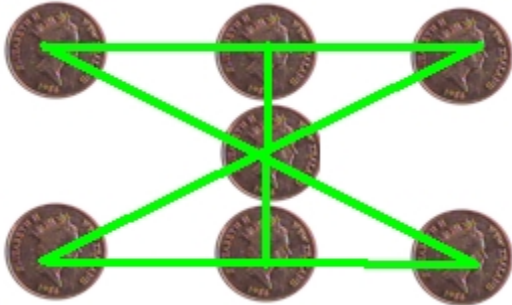


Solution: Pick up the coins that are in the middle of the sides of the square and put one on each of the corner coins. Then you have two coins on each corner and that adds up to four on each side.

PART 2: Arrange seven coins in the way that we have shown below. Now add two more coins to form ten lines that have 3 coins in each line.



Solution: At the moment there are five lines with 3 coins in each line (see below).



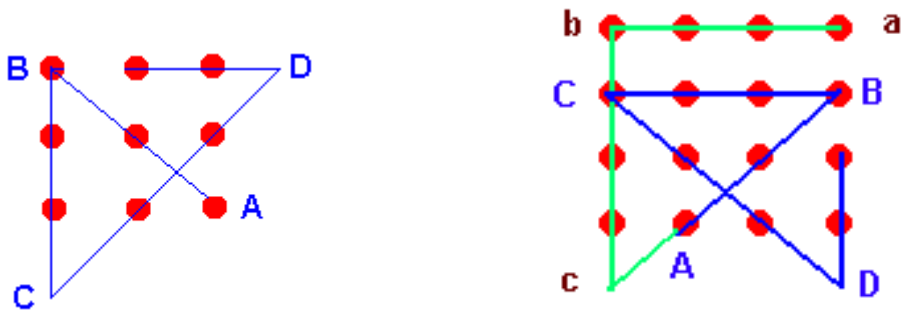
If we carefully put two coins on a level with the centre coin we can get all of the lines we want. We just show the five extra lines below.



PART 3: Can you connect the 16 points below with just six straight lines without lifting your pencil off of the paper and without passing through any point more than once?



Solution: We gave the hint of how to connect 9 points with just four lines. To do 16 add two lines to the 9 point problem. But you need to move things around so that A is the coin in the last row and second column.



PART 4: As you probably know, a magic square is an arrangement of numbers so that every row, column and diagonal add to the same number, the magic number of the square. For instance, here is a magic square that uses the numbers 1 to 9. It's magic number is 15.

4	9	2
3	5	7
8	1	6

Use all of the numbers form 1 to 16 to complete a magic square from what you see below.

	14	1	
2			13
16		10	
9			6

Solution: You can do this by trial and error or you can note that we have to use all the numbers from 1 to 16. So all these numbers add up to $16(1 + 16)/2 = 136$. (You'll find the formula for this – the number of terms by the sum of the first and the last divided by two – in the background to the Algebra part of the site.) But each row has the same sum. So each row is worth $136/4 = 34$. That observation leads quickly to noting that the missing number in the first column is 7. Then we can complete the first row and the leading diagonal; the second row and the last column; the third row (and, at the same time, the back diagonal); and finally the second and third rows. We end up with the following magic square.

7	14	1	12
2	11	8	13
16	5	10	3
9	4	15	6

PROBLEM OF THE MONTH

And now with a fanfare we bring on the problème du mois. This is a problem that was going round the Web about his time last year.

Four prisoners are placed so that they can only look straight ahead of them in the direction of the wall. (We show the way things are in the diagram.) They are all waiting to be executed (or forced to cook tea or something equally gruesome). They know that, between them, they are wearing two black hats and two white hats. If any one of them can say what colour hat they are wearing they will all be saved (or given takeaways or something equally happy). Which one shouts out and why?



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Once again we will give a \$50 petrol voucher to (i) anyone who sends us a solution to this month's problem (we'll choose one at random if we have a deluge) or (ii) anyone who sends us a problem that we can use here.

All the best for your teaching.

Gill, Derek and Joe.