

Newsletter No. 2

April 2001

Hi everyone.
This is our second nzmaths web site newsletter. We hope that you'll find something here that is useful and interesting. Once again we would like to encourage you to send us your contributions, that way we can see what other teachers are doing and perhaps use share of your good ideas.

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## WHAT'S NEW? ON THE FIELD

There has not been a great deal of action on the site this month. We have spent most of the month preparing the structure for the number units. We have also spent time editing typographical errors from our existing units. If you do see errors in any of our material please let us know as they are easily corrected. .What action there has been we show below.

## WHAT'S NEW? OFF THE FIELD

Off the field there has been considerably more action than on it. Two events that are significant for us (and hopefully will be for you soon) have been an Advisory Group meeting and a Writing Weekend.

## Advisory Group

Like all contracts with the Ministry of Education, we have an Advisory Group that meets a couple of times a year and considers progress to date and looks to possible futures. Our first meeting this year was on the 19th March in Dunedin.

We have had a lot of positive feedback for the site from all over New Zealand, from Kiwis abroad and from other countries. We were also able to report on the large number of people who use the site. In the next newsletter we'll prepare some facts and figures for you on site usage.

Below we list some of the useful ideas to came out of meeting.

1. Bookmarks: When units were added to the problem solving lessons on the web site, we produced bookmarks to advertise the new development. It was suggested that these were very useful and that it would be a good idea to reprint them or circulate the unused ones to Colleges of Education and other providers. (If you would like some more of these bookmarks please email us.)
2. Contexts: "Greedy Cat" seems to have been a successful idea for a unit. Perhaps other units could be based around books in that series or other well-liked and well-known ideas.

Many of the problem solving lessons, especially the earlier ones, had alternative contexts so that teachers could put them into a setting that was most appropriate for their class. It was suggested that this practice be maintained and even extended to the units as well as the problem solving lessons.
3. Links: This year we are going to assess other web sites and provide links to them on the site. It was suggested that teachers would find the links more useful if the links were flagged by both Strand and Level.
It might help teachers too, if there was a star rating for the reviewed/linked sites.
Sites other than specifically maths sites might also be usefully reviewed/linked. Web sites such dealing with topics such as meteorology, sport, time, airlines schedules, etc., might be the source of useful data and information.
4. Newsletter: The newsletter should keep an eye out for topical events of a mathematical nature (for example the Census). (We hope to do this from next month on.)
5.

It was felt that the prizes offered for solving the problems in the newsletter might attract more interest if they were awarded to a correct answer drawn from the winning entries rather than for the first correct solution. (You will notice that we have acted on this already.)

It was also suggested that we might profile a school each month in the newsletter; profile writers; and profile key maths educators. (We're working on it.)

## Writing Weekend

In the initial stages of the web site, virtually everything that appeared on the site was written by Gill Thomas and Derek Holton. This is no longer the case. At regular intervals during the year, a number of teachers, advisers and College or University lecturers come to Dunedin from all around the country (and sometimes from Australia) for a writing weekend. From Friday night to Sunday afternoon, they put together at least the bones of future units. These are then completed in the following weeks and duly appear on the site.

The first writing weekend of the year took place on the weekend of Friday 30th March. We wrote 15 units of work for "operating with numbers" and also a number of short maintenance activities for "number knowledge". To help produce these, Jo Higgins (Wellington College of Education), Peter Hughes (Auckland College of Education), Sarah Vokes (Auckland College of Education), and Vince Wright (Waikato University) made the trip to Dunedin.

Peter and Vince are the national co-ordinators of the Early and Advanced Numeracy Projects. Jo is actively involved in researching the success of the numeracy projects while Sarah is a facilitator for both projects and was the main writer for the Early Numeracy Project Material. Hence we are delighted that they were available and willing to come and write material for the site.

But current parts of the site are still to be maintained and extended. So at this weekend, Jim Neyland (Victoria University of Wellington), came along to help write some more problem solving lessons.

In coming newsletters (in view of the Advisory Groups suggestion), we hope to profile a number of these people.

## PROFILE OF THE MONTH: MARY CHAMBERLAIN

The Person: Mary Chamberlain is Manager: Assessment at the Ministry of Education in Wellington. She's coming up to her $6^{\text {th }}$ year with the Ministry (the longest she's been in one job). She is passionate about education and wanted to be a teacher from an early age. She still says "I love education, I love talking about it, I love reading about it, it doesn't seem like work to me."

Mary has been Manager: Assessment for a year now. She was previously a team leader in the Ministry's Curriculum Division and the person with responsibility for health and physical education. Before joining the Ministry she was an adviser to rural schools in Taranaki. She has been principal of a rural school (Tokaora) and a special school (Awhina) and spent many years as a classroom teacher. She is a graduate of Palmerston North College of Education and Massey University.

On her days off, she loves reading, tramping and spending time in her garden with her 7 chickens and her sheep (Mintz and Stu). She also would go crazy without her piano.

Her job: One of her big jobs at the moment is getting the National Exemplar Project up and running. The development of annotated national exemplars of student work in English and in Maori in each of the essential learning areas, (Levels 1-5) together with pilot exemplars for use in early childhood settings, begins this term.

What are exemplars? Exemplars are examples of student work that are annotated to illustrate learning, achievement and quality in relation to curriculum levels.

Why develop exemplars? Exemplars will help answer the question: what makes quality work? Teachers' judgements are guided by their understanding of the long- term educational outcomes signalled in achievement objectives but it's sometimes difficult to express progress and quality in words alone. Actual examples of work are needed to provide concrete reference points.

The exemplars developed during this project will provide sign posts that highlight critical features of children's work and signal important things for teachers to watch for, collect information about, and act on to support growth in learning. They will also be able to be used in discussions with students and parents.

Expectation is really powerful. There are many educational studies that show that if we don't expect much from students, they won't achieve much. On the other hand, there is consistent evidence that clear expectations that focus on educationally significant learning and high but
attainable standards raise achievement. To achieve this clarity, teachers and students need to develop shared understandings about what is meant by achievement, what progress means, and what makes quality work. Exemplars will help achieve this clarity.

Who will be involved? Teachers, expert teams and advisory groups will be involved in deciding what will be exemplified and developing exemplars in each curriculum area.

The exemplar development process will provide teachers with opportunities to share their understanding of curriculum, and build on their knowledge of what progress looks like in each curriculum area. It will provide an opportunity to really tease out important criteria and qualities of learning. Teachers will be involved in gathering and analysing collections of students' work, and in in-school and between-school discussions about criteria, indicators, progressions and quality.

Updates about the development and samples of developing work will be available on TKI from June 2001 onwards.

## WHAT'S ON IN MATHS?

Exemplars: Mathematics is one of the learning areas that is involved with the National Exemplar Project. Work on this has just begun and will continue over the next two years so that it will not be until 2004 at the earliest that every school will have access to all of the exemplars. However, some of you will be assisting in the development of these and clearly you will get to see them earlier than that.

The Maths Panel of the Project has been working on its first two exemplar tasks and one of them has been given extensive trialling. At the same time they are struggling with the notion of what teachers would find most useful in the way of supporting material. Some of their current thoughts and problems are listed below.

But first the exemplar task that is being trialled at the moment and what it is trying to achieve. You will see that the aim is to provide, where possible, simple tasks that are easy to use and are accessible to a range of student abilities. The exemplar below, covers Levels 1 to 3 .

Exemplar task: Will this table fit through that door?
Mathematical progression: In developing a concept of length, we believe that most children go through a series of steps. These are
(i) direct comparison - take the table to the door and find out directly;
(ii) indirect comparison - use a piece of string to measure the door and then see if the string will 'fit thorough the door';
(iii) repeated use of non-standard units - use 'hand' measures to measure the table and then see how the door compares;
(iv) measure using standard units to the nearest cm , then mm (this has sub-stages of knowing to use a ruler, knowing to measure from 'zero', and consistently measuring accurately);
(v) estimate and compare.

Aim: So the aim of this task is to enable the teacher to see where the children are on a mathematical progression of steps leading to a 'strong' concept of length. By watching the way that a child completes the task, the teacher knows where the child is in this progression. She can then move the child to the next step.

Final form for exemplars: The question now is, what is the best way to present these exemplars so that they are relatively easy to use? Just providing the task is insufficient, as it doesn't help you to see what the steps in the progression are. So surely the steps of the progression have to be included. These are probably best exemplified by actual children's work as these will act as a quick reference for use in the classroom. But what extra 'depths' should the exemplars go to? Here are some possibilities: a theoretical background (amplifying on the progression mentioned above); how to use the specific exemplar (this would say how to question the child as they attempt the task and how to move the child on to another step of the progression); parallel tasks (similar tasks to the above - in the 'door' task these might be parallel tasks in other areas of measurement); references. Would these be helpful? What else should be added? We'd be grateful for your feedback.

## COMING EVENTS: THE NZAMT CONFERENCE

The material below has been supplied by Sylvia Bishton of the Wellington College of Education (email address: Sylvia.Bishton@wce.ac.nz). It's important to realise that this conference will be of value to primary teachers and as well as to secondary teachers.

## Wellington 2001: A Maths Odyssey

Planning for the NZAMT 7 conference, to be held in Wellington from 3 July to 6 July, is well underway and registrations are arriving daily. If you have not received a flyer then the information can be found on www.nzamt.org.nz , or obtained from Sylvia.Bishton@wce.ac.nz (fax 044767189 ). We have extended the early bird registration fee of $\$ 300$ until April 12.

A number of presenters from overseas have been confirmed. These are:
Dr. Tom Korner is the visiting Forder Lecturer and is sponsored by the British Council. He is a Reader at Cambridge University, Director of Studies at Trinity Hall and is the author of the book 'The Pleasures of Counting'.

Evan Glazer is presently pursuing a doctorate in Instructional Technology at the University of Georgia. He is a big fan of the Star Wars movies. He will be giving presentations on 'The Mathematics of Star Wars' and 'Using the Internet as a tool to promote critical thinking in mathematics'.

Dr. Gail Burrill is from the United States and is sponsored by the NZ Statistical Association. She is currently at the National Research Council where she is Director of the Mathematical Sciences Education Board. She has been very active in the National Council of Teachers of Mathematics serving as President from 1996 to 1998. Gail is a Fellow of the American Statistical Association. The author of numerous books and articles on statistics and mathematics education, she has spoken on issues in mathematics education both in the USA and internationally. Gail will be accompanied by her husband Jack who will also present workshops at NZAMT 7.

Beatriz D'Ambrosio is a mathematics teacher educator from Indianapolis, USA. The paper she presented at ICME 9 in Japan in August 2000 was entitled "The dilemmas of preparing teachers to teach mathematics within a constructivist framework" and considered the difficulties that teachers face in integrating their own approaches to learning mathematics and their perception of mathematical knowledge and mathematical learning.

We also plan to have a number of New Zealand speakers at the conference as well as a variety of workshops to choose from. These will be of interest and practical use for both primary and secondary teachers. If you are interested in running a workshop we may still be able to fit you into the programme.

The New Zealand Association of Mathematics Teachers would like to thank CASIO the major sponsors of the conference and Air New Zealand the official carrier to Wellington 2001: A Maths Odyssey.

The organising committee looks forward to seeing you all in Wellington in July!

## PROBLEM OF THE MONTH

I'm sorry to say that last month we had no entries in our problem competition. As a result we'll leave part of last month's problem open this month. But we'll also give you the solution to a part of it as well as a hint for another part. So here are the problems again plus one more for good measure (see Part 4).

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


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.


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?

## ¿〇〇:

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 to Part 1: One way to do this is to take the middle coins from each square and put them onto the corner coins. Two coins in each corner add up to four coins on each side of the square.

Hint for Part 3: The similar problem with 9 points asks can you draw you draw 4 lines through the points without taking your pen off of the paper. We do that below. Start at A, go to B, then C, then D and back to B . Does that make Part 3 any easier?


We hope that you will send us your solutions (or your class' solutions). We'll put them all into a hat to choose a winner for the prize of a $\$ 50$ petrol voucher or book tokens.

We'd also appreciate problems from you for next months' problem. We'll be looking for sponsors so that we can give at least a $\$ 50$ petrol voucher to anyone who sends us a problem that we can use here. If anyone has any 'sponsorial' contacts we'd appreciate hearing about them.

All the best for your teaching.
Gill, Derek and Joe.

