Inside

2003 Annual Conference
'Making Mathematicians'

4-5 December 2003
'Making Mathematicians'
Get your options in now!

The closing date has been extended to Friday 30th May.
Download an application form from
www.mav.vic.edu.au/pd/confs/index.html
or contact the office.

2003 MATHS TALENT QUEST DON'T MISS OUT!

Forgotten to send your application for the 2003 MTQ? Applications can still be submitted for this year's Maths Talent Quest. Direct queries to Doreen Forrest 9389 0304 or email
dforrest@mav.vic.edu.au

PDs 2003

Check the PD pages inside as well as the web site for all the latest details
www.mav.vic.edu.au

Primary Days

Monday 2nd June, South Morang

 Monday 16th June Geelong.

This is your final chance to book a place at either of these days.

Did you know? South Morang is just north of the city. Although it sounds like a remote town it is in fact, metropolitan.

Middle Years Days

Bookings open next month

Friday 22nd August, Balllarat

Monday 1st September, Moorabbin

For more details see the PD pages inside.

EDUCATION WEEK 2003

The MAV/Cook's Cottage Education Program - **Free entry**

Cook's Cottage, Fitzroy Gardens, Wellington Parade, East Melbourne
Wednesday, May 14, 9am - 4pm Contact: Joan O'Grady Ph. 9419 5766

'Counting on Cook'
Take a guided tour of Captain Cook's cottage and experience what life was like in the 1750's. Students will embark on a voyage of discovery of the mathematics of Cook's Cottage and venture out into its surrounds to discover the mathematical mysteries of Fitzroy Gardens. Find out how it was possible for the Cook family to live without the modern day essentials of electricity and running water. Also learn about his three command voyages. Maximum of 30 students per session. Suitable for Middle Years students.

Guest editorial from MAV Student Activities Committee

Mathematics Enrichment Programs in Schools

Background

At a Heads of Faculty meeting (independent schools) early in 2002, the MAV Student Activities Committee requested interested teachers to come together in order to pool enrichment material and resources. This would be done with a view to publishing a list of available material.

During the discussions the focus shifted to looking at enrichment programs and their nature and purpose in different schools. It became apparent that there was a need to look more widely at enrichment programs rather than just collate materials.

Many teachers were interested to know what others were doing in terms of the structures they had in place and the level of commitment schools were prepared to offer. Whether acceleration in mathematics is the only way to go is also an issue that schools are grappling with.

The committee then shifted its focus to the production of a manual to assist teachers in structuring enrichment programs for more able students.

This was also seen as a way of helping schools, and school administrations, in particular, to understand the greater need to focus on enrichment in mathematics and perhaps less on acceleration.

Enrichment in mathematics is the responsibility of all classroom teachers and is not meant to be the sole property of the high achievers.

However, our work in producing this manual was specifically geared to offering support to schools that offer, or are looking for ways to offer, enrichment programs for their gifted and/or highly capable mathematicians. (Broader issues related to enhancing students' mathematical learning was not the focus of this group for the time being.)

We identified the following chapters:

- Resources
- Sample School Structures
- Student Identification
- Sample Programs
- Acceleration Programs:
    - History
    - Pros and cons
    - Anecdotal and statistical evidence

So with all this behind us, we called for interested parties to be involved in the production of one or more of these chapters. Our first meeting began with an attempt to define enrichment. This was quite a debate. In the end we settled on the following definition:

The underlining purpose and nature of an enrichment program is to recognise, nurture, motivate and consolidate mathematical talent; particularly the talent that relates to creativity and higher order thinking skills.

In an environment which provides opportunities without restrictions, for students to construct mathematical concepts for themselves, such a program is delivered with a view to further enhancing student understanding of the application and use of mathematics in everyday life.

There have been many terms used to describe such programs, with acceleration, enrichment, enhancement and extension being the main ones. For the purpose of this document, we have chosen to make the following distinctions.

Acceleration* is defined as a program that delivers content at a level above the standard of any given year. For example, a Yr 6 student working at CSF Level 5 in Number.*

__Extension__ is defined as the completion of additional, more challenging problems that seek application of the facts and skills content __from a given topic__ in a manner that requires greater use of higher order thinking skills. They may also be challenging problems that fuse related skills from other standard topics, areas of study or in fact other subject areas.

__Enhancement__ is defined as a program that delivers mathematical skills and techniques that are not part of a typical mathematics course of study. This would include problem solving tasks that explore new, different and perhaps more complex mathematical concepts. This is often referred to as lateral extension work and is targeted at those students that have advanced higher order thinking skills for their age.

An __Enrichment Program__ is defined as one that delivers aspects of acceleration, extension and enhancement and is designed to enable students to maximise their learning potential.

Where to from here?

The committee has set up working groups for each chapter. Most groups are looking to survey schools to gather data about the programs they currently offer. What you'll find below is a list of contacts for each working party.

The MAV encourages as many schools as possible to participate in the completion of various surveys. We are aware that this can be a daunting task and so each group has kept their survey simple.

On the other hand, you may choose only to participate in a survey that is of particular interest to your school. Those who choose to participate in a survey will be the first to receive the results. For further information about the various areas being surveyed, please contact the people named below:

- **Sample School Structures and Programs**
  Theo Vlantis
  Theo.Vlantis@pegs.vic.edu.au

- **Resources**
  Ritsa Athanasiadis
  athanr@gen.melb.catholic.edu.au

- **Student Identification**
  Pam Hammond
  hammond.pam.p@edumail.vic.gov.au

- **Assessment and Reporting**
  Carol Pattrerson
  pattersonc@haileybury.vic.edu.au

- **Accelerated Programs**
  Phil Tascone
  tascop@gen.melb.catholic.edu.au

We would also like to take this opportunity to invite people to join one of these groups. This is a wonderful opportunity for professional development with what we hope will have real outcomes.

It is vital to understand however, that active membership is required. You will have to chase the information rather than expect it to come to you.

Phillip Tascone
Student Activities Committee

MAV Reference Library

Come and Visit Us!

Members may not be aware that the MAV office in Brunswick has an excellent reference library for mathematics teachers and education students.

The collection of over 1300 items covers all year levels, and includes many of the current maths text books, resource books, hands-on activities, past exams, supplier catalogues, an excellent selection of national and international periodicals, as well as curriculum documentation.

Feel free to visit us during office hours - the office is usually open Monday to Friday from 9.00am to 5.00pm. Photocopying is available in the office @ 10c per A4 page.
The extensive library catalogue is now on the MAV website, so you can check out our collection before making the effort to visit. Just go to www.mav.vic.edu.au

Ready To Go Mathematics Activities
Presented by Rob Vingerhoets
Thursday 5th June, 2003.
4.15pm-6.15 pm
Chirnside Park Primary School, Kimberley Drive , CHIRNSIDE PARK.
Cost $35.00

Rob is a sensational presenter who provides practical, quick and easy maths activities for teachers to present in their classrooms from grades prep-6 including problem solving techniques and games.

For bookings phone Linda Baron (Mathematics coordinator) on
9727 3466 or fax 9727 2978 or email:
baron.linda.m@edumail.vic.gov.au

Do not call the MAV office.

Note: places are limited so get in early.
Enrolments close Thursday 22nd, May.

MTQ Committee

Are *you* interested in being involved in the organisation of the Maths Talent Quest? We need committee members to assist with the mammoth task of organising this great event that benefits not only students, but teachers too.

Get involved in the judging, the awards ceremony and have your say on the future organisation of MTQ. Contact Doreen Forrest at MAV on 03 9389 0304, email dforrest@mav.vic.edu.au. The next meeting of the committee is on Thursday, June 5 at 4.30pm here at Brunswick.

CALL FOR JUDGES

A great professional development opportunity. Come and help judge the 2003 MTQ.

Collect new and exciting ideas for your classroom. Judging takes place from Saturday, July 26 to Tuesday, July 29 at Brunswick South West Primary School. Choose a time that suits you and make a day/evening of it.

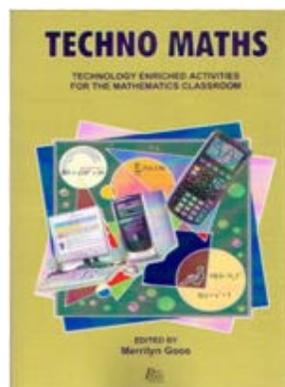The venue is close to both Lygon Street and Sydney Road, both with a fine array of eateries to choose from.

Judging sessions are:

Saturday July 26	10 am-12 pm, 1- 5pm
Sunday July 27	1 pm -5 pm
Monday July 28	5 pm -9 pm
Tuesday July 29	5 pm -9 pm

For more information contact Emma 9380 2399 or Doreen on 9389 0304.

Excited about Mathematics

Secretary, Andrew Cole and President, Amanda Lilburne

More than 50 mathematics teachers from around central Victoria gathered in Bendigo in April for the MAV Annual General Meeting.

The meeting relaunched the Bendigo chapter of the MAV and attracted an unprecedented number of maths teachers from all over the Bendigo region.

The newly elected President, Amanda Lilburne said the meeting was an unprecedented success, particularly because   it attracted teachers from across the primary, secondary and tertiary sector.

"We are very excited about the level of interest in the Bendigo region," Ms Lilburne said.

The Bendigo Chapter of the MAV will meet regularly throughout the year. The new Executive includes:

Amanda Lilburne – President
Andrew Coldwell – Secretary
Stuart Payne – Treasurer

Details for Bendigo's next PD activity are in the next column and remember to look out for more PDs throughout the year.

BENDIGO PD
'What works for me'
Tuesday 27th May 4.00-6.30

Topic:
A sharing theme of 'What works for me'

Venue:
Loddon-Campaspe Mallee Regional Office auditorium

Date: Tuesday 27th May

Time: 4.00 – 6.30 pm

Cost: $5.00 (Members) $10.00 (Non-Members)

All participants will receive a booklet of ideas after the session.

To register contact the Secretary, Andrew Coldwell **coldwell.andrew.a@edumail.gov.vic.au**

PRIMARY SERIES

The MAV has also organised a Primary Series at Bendigo North Primary School.

For more details see the PD Calendar on page 12

Problem of the Month

ADD & MULTIPLY

Goal:
To find the highest value by adding pairs of dice and then multiplying.

Materials:
Four dice.

Players:
Two players or two groups of two players.

How:
The four dice are rolled and the players race to produce the largest value (if 2, 3, 4 and 6 are rolled, they could be paired in the following ways:

- 2 + 3 = 5 & 4 + 6 = 10 so 5 x 10 = 50

- 2 + 4 = 6 & 3 + 6 = 9 so 6 x 9 = 54

- 2 + 6 = 8 & 3 + 4 = 7 so 8 x 7 = 56

The player/s with the highest value score one point. Play for a set number of turns or to reach a specific total value target.

Variations:
Find the smallest total.
Add three numbers and multiply by the fourth.
Use different types of dice (4, 10 or 12 sided)

Adapted from Dice Dilemmas by Paul Swan, published in The Best of Family Maths. **Both publications can be found in the MAV Publications 2003 catalogue.**

WEB REVIEW

SOS Mathematics
http://www.sosmath.com

A site that offers a free resource of more than 2500 pages of maths review materials for:

Algebra	Complex Variables
Trigonometry	Matrix Algebra
Calculus	Tables
Differential Equations	

Each topic is presented in a series of steps from the simplest to the more complex with short and easy-to-understand explanations.

The questions are listed, click on *solution* to find a step-by-step explanation followed by links to other examples and similar problems.

Find many interesting and informative links to other maths sites. It is great for students to use at school and home.

Solutions to last month's problem – Magic Star Puzzles
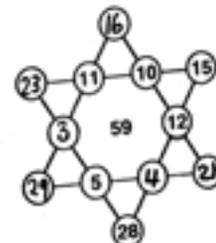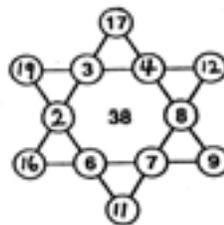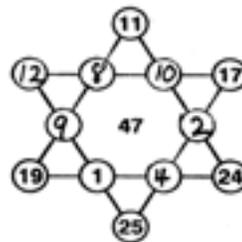
Book Review

TECHNO MATHS – TECHNOLOGY ENRICHED ACTIVITIES FOR THE MATHS CLASSROOM
Edited Merrilyn Goos, 2002, Post Pressed Qld, , 98 pages, $41.50

How good was Bob Beamon?

In 1968 Bob Beamon smashed the world long jump record by 65cm, setting a mark that stood for an unparalleled thirty-three years.

Hence a mathematical investigation: by considering the world records over the century, students find how far ahead of his time Bob Beamon was – an astonishing 48 years!

TECHNO MATHS has thirteen investigations, which use technology as a main tool to develop mathematical concepts and investigate problems.

In this task, students use a spreadsheet or Graphics Calculator to fit a line to world record data and investigate how far off this line Beamon really was. It was a simple,
yet very rich task most students thoroughly enjoyed.

This recent Queensland publication contains activities compiled and used by pre-service teachers. All use technology as a tool to investigate interesting problems, and come with comprehensive solutions, teaching notes, and mapping to curriculum frameworks.

For your money you get a booklet with thirteen well-developed investigations. You also get a CD containing an electronic version of the book plus a spreadsheet activity on queuing theory.

If you're looking for a resource to help you use technology in the classroom, this is terrific. However, I found it important to work through the activities first before trying them in the classroom.

Here's one more task to think about. The Love Bug.

'The recent havoc wreaked in cyber-world by the infamous 'Love Bug' virus has served as the inspiration for this technology-based activity. It involves a simulation of students sending email messages, in order to investigate the spread of computer viruses…'[1]

The use of acids and bases to model this problem physically, combined with the use of Graphics Calculators to fit functions to the resultant data, is a fascinating and powerful way of modelling exponential functions and looking at the spread of AIDS, computer viruses, or other diseases.

I look forward to using TECHNO MATHS in my class regularly to add interest, better use technology, and help connect mathematical concepts with the real world.

Colin Shnier
Wesley College, Elsternwick campus

[1] TECHNO MATHS p 53
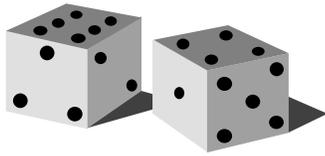
YEAR 9 GAMES DAY

AT

BLACKBURN HIGH SCHOOL

A Games Day for Year 9 students, organised by Blackburn High School in conjunction with the MAV, will be held on Wednesday 18 June, 2003, at Blackburn High School, found on the corner of Springfield and Williams Roads in Blackburn (Melways Reference: 47 K7).

Schools may nominate one or two teams of four students each, at a fee of $25 per team. The day's activities will start at 9:45am and conclude at approximately 2.30pm and lunch will be provided. The Games Day promises to be a challenge as well as fun.

Please detach the form below and mail it, along with your entry fee to the address shown below, by
2 June, 2002. The fee is $25 per team (Food $11.50 inc. GST, Registration $13.50)

Make cheques payable to Blackburn High School (ABN: 26609438650).

Further enquiries should be made to Michael Westbrook on 03-9878 4477, or fax 03-9894 2435.
Email: mwe@blackburnhs.vic.edu.au

Details: Students needs to bring writing implements, a scientific calculator (graphics calculators are not permitted) and something for morning tea. Lunch will be provided.

MATHEMATICS GAMES DAY FOR YEAR 9 STUDENTS, 18 June 2003
Tax Invoice

Blackburn High School
60 Springfield Road
BLACKBURN VIC 3130

NAME OF SCHOOL: _____

ADDRESS: _____ POSTCODE:_____

PHONE: _____ FAX:_____

TEACHER CONTACT: _____

NUMBER OF TEAMS: _____

Send this form with your payment to: Mr M. Westbrook, c/- Blackburn High School, 60 Springfield Road BLACKBURN, VIC 3130, **by 2 June, 2003**

IMPORTANT: A completed copy of this form becomes a ***Tax Invoice** on payment. Keep a copy of the completed form for your records. The original must be returned with your payment.

Date: _____/_____/_____

Ad 3 half page 2 columns wide

2003 CLUNIES ROSS NATIONAL SCIENCE & TECHNOLOGY AWARDS PRESENTED

A Clunies Ross National Science & Technology Award is given to people who have persevered. They've had an idea and worked hard, often against the odds, to see it through to the point where it's made a significant difference.

And the winners are…

Jennie Brand-Miller, David Boger, David Doddrell, Stephen Elliott, Ron Grey, Ahmad Shayan and David Blair.

For more information about the awards visit http://www.cluniesross.org.au/cr2003
To view photos from the night visit http://cluniesross.org.au/2003photos

Professional Development 2003

Bookings are now being taken for the following professional development activities in the 2003 MAV program. All prices quoted below are GST inclusive.

To book for *full day PD activities* use the *specific* form. For *After School PD* - single or series sessions, use the *generic* registration form.   Forms are available in this/past issues of the Common Denominator or download them from the MAV web site at www.mav.vic.edu.au.or contact the office.

Further workshops and their details will be published here with online booking facilities coming soon.

PROFESSIONAL DEVELOPMENT CALENDAR

A quick look at what's on offer! For more details see below in Full Day PD and the After School offerings.

Date	Title	Years	Location	Time
TERM 2				
Wed 28 May	Exploring Creative Problem Solving Activities Teaching Number (P-6)	P - 6	Bendigo	4.30 - 6.30pm
Wed 28 May	Activities for focussed teaching of Number (P-4)	P - 4	Lilydale	4.30 - 6.30pm
Mon 2 Jun	Primary Maths teachers day (see specific form for program details)	P - 6	South Morang	9am - 3.30pm
Tues 3 Jun	SACs for Specialist Maths- Book online	VCE	Glen Waverley	4.45 - 6.45pm
Wed 4 Jun	Activities for focussed teaching of Number (P-4)	P - 4	Gardenvale	4.30 - 6.30pm
Wed 4 Jun	Problem Solving Activities for the Middle Years - Number	5 - 9	Camperdown	4.30 - 6.30pm
Wed 11 Jun	Exploring Creative Problem Solving Activities Teaching Space (P-6)	P - 6	Bendigo	4.30 - 6.30pm
Wed 11 June	Activities for focussed teaching of Space (P-4)	P - 4	Lilydale	4.30 - 6.30pm
Mon 16 Jun	Primary Maths teachers day (see specific form for program details)	P - 6	Geelong	9am - 3.30pm
Wed 18 Jun	Activities for focussed teaching of Space (P-4)	P - 4	Gardenvale	4.30 - 6.30pm
Wed 18 Jun	Problem Solving Activities for the Middle Years - Space	5 - 9	Camperdown	4.30 - 6.30pm
TERM 3				
Wed 23 July	Exploring Creative Problem Solving Activities Teaching Chance & Data (P-6)	P - 6	Bendigo	4.30 - 6.30pm
Wed 23 July	Activities for focussed teaching of Measurement (P-4)	P - 4	Lilydale	4.30 - 6.30pm
Thur 24 July	A workshopped overview of Mathematica	7 - 12	Caulfield South	4.45 - 6.45pm

	Term 3 Continued				
Thur 24 July	Activities for focussed teaching of number (P-4)	P - 4	Taylors Lakes	4.30 - 6.30pm
Wed 30 Jul	Problem Solving Activities for the Middle Years - Chance & Data	5 - 9	Camperdown	4.30 - 6.30pm
Wed 30 July	Activities for focussed teaching of Measurement (P-4)	P - 4	Gardenvale	4.30 - 6.30pm
Wed 6 Aug	Exploring Creative Problem Solving Activities Teaching Measurement (P-6)	P - 6	Bendigo	4.30 - 6.30pm
Wed 6 Aug	Activities for focussed teaching of Chance & Data (P-4)	P - 4	Lilydale	4.30 - 6.30pm
Thurs 7 Aug	Activities for focussed teaching of Measurement (P-4)	P - 4	Taylors Lakes	4.30 - 6.30pm
Wed 13 Aug	Problem Solving Activities for the Middle Years - Measurement	5 - 9	Camperdown	4.30 - 6.30pm
Wed 13 Aug	Activities for focussed teaching of Chance & Data (P-4)	P - 4	Gardenvale	4.30 - 6.30pm
Wed 20 Aug	Play the Bingo, Trigo, Expo, Logo…and win the Prize!	Adult	Brunswick	5.00 - 6.30pm
Thurs 21 Aug	Activities for focussed teaching of Space (P-4)	P - 4	Taylors Lakes	4.30 - 6.30pm
Fri 22 Aug	Middle Years Teachers Day (see specific form for program details)	5 - 9	Ballarat	9am - 3.30pm
Mon 1 Sept	Middle Years Teachers Day (see specific form for program details)	5 - 9	Moorabbin	9am - 3.30pm
Thurs 4 Sept	Activities for focussed teaching of Chance & Data (P-4)	P - 4	Taylors Lakes	4.30 - 6.30pm

FULL DAY PD – for more details see the specific form or contact the MAV office.

COST (inc GST): $120 for members; $150 for non-members. Includes morning tea and lunch.

Special members offer - $100 per person for schools sending 4 or more teachers

Date/Time/Venue	Topics
Friday 16thMay 9.00am-3.30pm Ranfurly Primary School - Mildura	**MAVRIC - MAV Regional Inservice Conference (P-12)** Direct inquires to Pauline Rogers - progers@mav.vic.edu.au Special Cost - $77 (members), $99 (non-members) Use the specific form for information & registration
Monday 2nd June 9.00am-3.30pm Plenty Ranges Convention Centre - South Morang (Northern Metropolitan Region) Monday 16th June 9.00am-3.30pm Geelong Football Club - Geelong	**PRIMARY MATHS TEACHERS DAY (P – 6)** Session topics include: * Effective and enjoyable teaching and learning of measurement * Place Value Fundamentals * Challenging the Gifted * Creating an Effective Mathematical Learning Environment * Fun and Games * What do we do after the Early Years Interview * Maths to Motivate Use the specific form for information & registration. (In last Month's CD/website/request a fax from the office.)

Friday 22nd August 9.00am-3.30pm Ballarat University - Ballarat	**MIDDLE YEARS TEACHERS DAY (5 – 9)** Session topics include: * Middle Years Numeracy Intervention * Tracking the path of Algebra * Techniques for teaching multiplication and division * Geometry in the Middle Years
Monday 1st September 9.00am-3.30pm Edmund Barton Centre - Moorabbin	* Assessment & Reporting * Using calculators and computers in the Middle Years * Let's have fun with Maths Use the specific form for information & registration (Available next month)

After School PD - Single Sessions

COST (inc GST): $40 per session for members, $50 for non-members.

After School Events	Venue	Date & Time
SACs for Specialist Maths *Presented by Michael Swanborough & Peter Fox* Participants will be provided with a selection of Analysis and Application Tasks that have been used successfully in VCE Specialist Mathematics. The process of developing appropriate tasks, including criteria mappings and the inclusion of technology will be discussed with specific reference to the tasks provided. Participants will then have the opportunity to network with other teachers to develop an Application Task SAC for the 2003 school year. Teachers are encouraged to bring along any ideas they may have for this task.	Glen Waverley Secondary College Science & Technology Centre Snedden Drive	Tuesday 3rd June 4.45-6.45pm
A workshopped overview of Mathematica *Presented by Ian Roberts & John Brownstein* Mathematica is a general-purpose symbolic computation program that empowers mathematicians, engineers, scientists, teachers and students. In addition to mathematical computation, Mathematica incorporates fully editable input and output suitable for mathematical typesetting. In this session, an overview of the capabilities and uses of Mathematica will be given, followed by a PC lab workshop. Beginers and the more experienced will be able to explore the application of Mathematica to their area of interest. Examples applicable to 7-12 teachers and students will be given. Participants are invited to email ian@quantica.com.au if they have specific applications, such as CAS Maths Methods or technical publishing, that they would like discussed.	Glen Eira College Booran Road Caulfield	Thursday 24th July 4.45-6.45pm
Play the Bingo, Trigo, Expo, Logo and win the Prize! *Presented by Betty Key* A series of games resembling "Bingo" are introduced to enhance better learning in trigonometrical, exponential and logarithmic functions. Participants will have a good chance to win big prizes! The prizes are hand-made souvenirs which are well designed with relevant maths information. Ideas to handcraft these from recycled material are also shared. These special gifts add fun to the activities and reveal the great beauty in Maths! They also play an important role in stimulating, encouraging and supporting frustrated and struggling maths students.	Cliveden (MAV office) Blyth Street Brunswick	Wednesday 20th August 5.00-6.30pm

After School PD - Series

COST (inc GST): $40 per session for members, $50 for non-members
Special members offer - make 4 bookings for any combination of after school sessions and only pay for 3!

After School Events	Venue	Date & Time
Exploring Creative Problem Solving Activities Teaching …. number, measurement, space, chance and data. *Presented by Peter Martin* Problem solving activities have long been a valuable teaching tool used by teachers from all walks of life. In particular they represent a valuable strategy for teaching mathematics in our primary schools. This series of four sessions has been specifically designed for primary teachers and will provide examples of problem solving-type activities that have previously been used for the teaching of **number, measurement, space, chance and data.**	Bendigo North Primary School Smith & Nolan Sts, Bendigo	Wednesdays 4.30 - 6.30pm 28 May 11 June 23 July & 6 August
Activities for focussed teaching in the Early Years (P-4) *Presented by Ron Smith & Kim Beattie* (Last years sold out series returns! In two locations!) This series has been designed for Early Years teachers and will provide activities as well as other 'good' teaching strategies for focussed teaching of **number, space, measurement and chance & data.** The activities will include games, techniques that promote pupil-pupil discussion and problem-solving situations that encourage pupils to construct mathematical ideas.	Birmingham Primary Francis Cres Lilydale	Wednesdays 4.30 - 6.30pm 28 May 11 June 23 July & 6 August
	Gardenvale Primary Landcox St Brighton East	Wednesdays 4.30 - 6.30pm 4 June 18 June 30 July & 13 August
Activities for focussed teaching in the Early Years (P-4) *Presented by Sandra Knox* **Number, space, measurement and chance & data** topics will be covered each fortnight in Sandra's own unique style. Each night will be full of activities including games, techniques that promote pupil-pupil discussion and problem-solving situations that encourage pupils to construct mathematical ideas.	Taylors Lakes Primary Chichester Drive	Thursdays 4.30-6.30pm 24 July 7 August 21 August 4 September
Problem Solving Activities for the Middle Years: Number, Measurement, Space, Chance and Data. *Presented by Peter Martin* A series of hands-on sessions has been specifically designed for teachers of the middle years (5-9). Each session will explore one of these topics in turn with respect to the effective use of problem solving activities and group work as means of enhancing teaching in these areas. Participants will be expected to engage in, and discuss, a range of activities designed to explore and develop strategies for use in the classroom.	Camperdown P - 12 College, Wilson St Camperdown	Wednesdays 4.30 - 6.30pm 4 June 18 June 30 July & 13 August

Professional Development Application Form   Tax Invoice

School: _____

Address: _____

_____

_____   Postcode: _____

Telephone: _____   Fax: _____

Principal's Endorsement (if required):   _____

MAV Membership: ☐   Institutional   ☐   Individual   ☐   Non-member

Please reserve places for the following:

Date	Venue (ie Bendigo)	Title of Session	Name of Attendees	Cost (inc. GST)
TOTAL COST INC. GST				

Method of Payment:

I enclose a cheque/money order/purchase order for $_____ (made payable to MAV)

Purchase Order No. _____

OR
Please charge $_____ to my: ☐ Bankcard   ☐   Mastercard   ☐   VISA card

Card Number: ☐☐☐☐   ☐☐☐☐   ☐☐☐☐   ☐☐☐☐

Name on card: _____

Expiry Date: _____   Signature: _____

Please return this form to:

The Mathematical Association of Victoria (ABN 34 004 892 755)

Cliveden, 61 Blyth Street, BRUNSWICK VIC 3056, Tel. 9380 2399, Fax. 9389 0399
ACKNOWLEDGEMENT LETTERS: Letters of acknowledgment are only sent out to attendees for full day professional development sessions. Those people attending after school professional development sessions will **only be** notified if a place is **NOT** available.

CANCELLATION:
If you are unable to attend a session that you have booked into, refunds will not be issued if you cancel your booking less than 48 hours prior to the session. Bookings are transferable to another person.