

# SHORT CIRCUIT

Newsletter of  
the Canberra Mathematical Association INC

## Coming Events:

- February 6 *Committee & Special General Meeting—audited accounts to be presented—Stromlo High, 7 p.m.*
- February 24 *Welcome drinks function. ACU Rose garden—4:30 p.m.*
- August 17-18 *CMA Annual Conference. Australian Catholic University*
- November 9 *The 314th day of the year—Pi day!*
- November 14 *CMA Annual General Meeting*

## FROM THE EDITORS

We wish you a relaxing summer break and may 2012 be for you mathematically and pedagogically excellent.

Readers are invited to contribute material for publication. Suitable submissions could include:

- \* Reports or commentary on events and developments related to mathematics education in your school or system.

- \* Short articles about mathematics education or about mathematics itself.

- \* Problems, puzzles and educational activities suitable for primary, secondary and college students

- \* URLs and reviews of useful websites.

Short Circuit is jointly edited by Paul Turner and Jurek Paradowski.

Contributions can be sent by e-mail to

paul.turner@ed.act.edu.au  
6205 8104

or to

jurek.paradowski@ed.act.edu.au  
0433 647 694

Alternatively, you can use the CMA mailing address:  
PO Box 3572,  
Weston ACT 2611.

We welcome your feedback.

## OUR NEW PRESIDENT

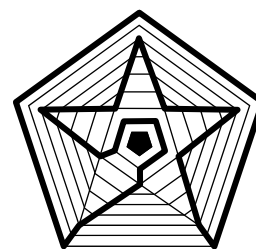
At the 2011 AGM for the CMA Erin Gallagher, Head of BEAMS (Business, Economics, Accounting, Mathematics and Social Sciences) at Hawker College was elected the new president. An ACT educator for 7 years, with some experience in Queensland prior to that, she is passionate about mathematics, mathematics teaching and increasing the enjoyment and beauty of mathematics for students. Erin worked for a number of years in the Literacy and Numeracy Section where she developed the MYMC (Middle Years Mental Computation) program that many of you might be aware of. She has also taught within the teacher education programs briefly at ACU and at UC for the last 2 years.

“I am really pleased to be a part of the CMA. The association is made up of many passionate and dedicated individuals who volunteer their time to facilitate, coordinate and run events and opportunities for teachers of mathematics in the ACT. This next year, is not a year of a new president, but another year continuing the dedication of a team who have great ideas about how to provide support for mathematics teachers in the ACT.”

*Erin Gallagher*



Find us on Facebook



VOLUME 2, NUMBER 2

DECEMBER, 2011

## MEMBERSHIP

Membership of the CMA includes automatic affiliation with the Australian Association of Mathematics Teachers and a free AAMT journal.

Members are entitled to cheaper rates for CMA professional development events and the annual conference.

A membership application form for the CMA can be downloaded from our website:

[www.canberramaths.org.au](http://www.canberramaths.org.au)

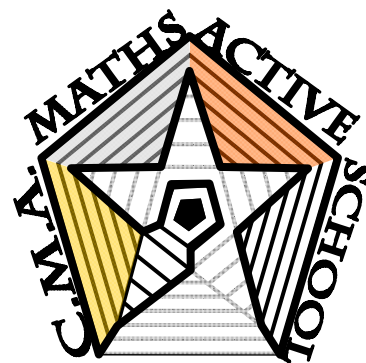
Note:

Receipts for membership payments are normally sent out by e-mail. If you have paid for your membership but have not received a receipt or if your AAMT journal(s) have not been arriving, please advise CMA treasurer, Paul Turner, or a committee member.

## SHORT CIRCUIT

### MATHS ACTIVE SCHOOLS

Congratulations to  
**Hawker College**  
**Calwell High School**  
 for their recent accreditation as  
 Maths Active Schools in the  
*silver* category.



Schools who have achieved Maths Active School status will shortly be invited to retain their status in 2012 through a simple process of confirming their commitment to mathematics education.

They will also have the opportunity to upgrade their accreditation from bronze to silver or from silver to gold.

*Is yours a Maths Active School?*

*If not, talk to Jurek Paradowski about what it means and how it's done.*

### PROBLEM

*‘How many digits?’*

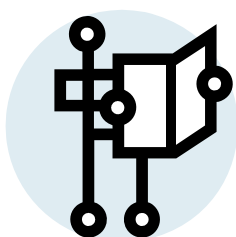
In the recent edition of Australian Senior Mathematics Journal, Oleksiy Yevdokimov re-posed an old problem: Compute the number indicated by

$$4^{4^4}$$

A related but easier question is: How many digits does this number have?

### OBITUARY

We regret the passing of CMA member Mosadeque Ali on 7 December. Mos was a staff member at Narrabundah College and formerly at Erindale College.



### USEFUL LINKS

EMPHASiS, newsletter for the Scientists in Schools( SiS ) program, and its sub-program Mathematicians in Schools ( MiS ).

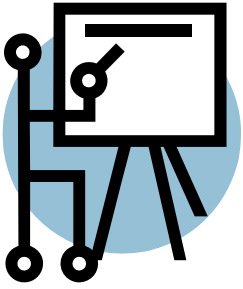
[http://www.scientistsinschools.edu.au/downloads/newsletter/EMPHASiS\\_Issue\\_04%20May\\_2011.pdf](http://www.scientistsinschools.edu.au/downloads/newsletter/EMPHASiS_Issue_04%20May_2011.pdf)

Australian Curriculum website: <http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10>

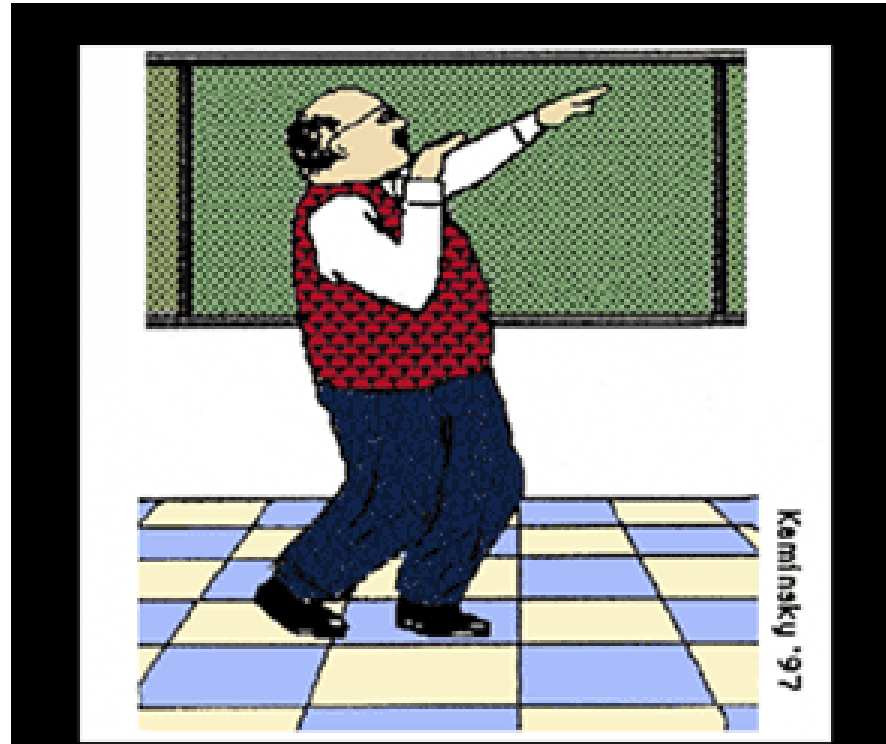
CSIRO: Maths by Email: <http://www.csiro.au/resources/Maths-by-Email.html>

AAMT: <http://www.aamt.edu.au>

Mathematical Association of WA on-line quiz: <http://www.havesumfunonline.com>



*It came to Professor Fogelfroe in a dream—how to teach limits through interpretive dance.*



## TWITTER

### Looking to expand your Professional Learning Network?

Twitter is fast becoming one of the easiest ways to connect with teachers, discuss pedagogy and share resources. If you are looking to develop or add to your own professional learning network here are 4 people and 3 hash tags. (just to get you started! )

#### CANBERRA Maths Teachers on TWITTER

Erin Gallagher @ezka29 ( P resident of CMA, teacher at Hawker College )

Toby Hartley @tegski0 ( C MA Council member, teacher at Hawker College )

Sheikh Faisal @sheikh\_613 (teacher at Hawker College )

Some interesting HASHTAGS you might enjoy

#mathchat - a chat run live twice a week and facilitated by @ColinTGraham connect live with teachers of mathematics from around the world, or follow the backchannel for interesting and stimulating ideas

#edchat – a chat with and interesting backchannel more broadly tailored about education in general

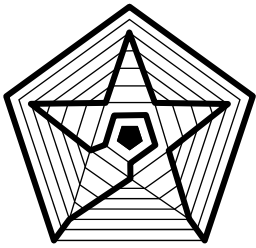
#ipaded – for those with a technological twist, you might find some interesting resources using iPads if you follow this hashtag

The following website can also help you get started with twitter. <http://bit.ly/ceuKuq>

Tweet you later!

@ezka29





**NEWSLETTER OF  
THE CANBERRA MATHEMATICAL  
ASSOCIATION INC**

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## ABOUT THE CMA

The Canberra Mathematical Association (Inc.) is the representative body of professional educators of mathematics in Canberra, Australia.

It was established by, among others, the late Professor Bernhard Neumann in 1965. It continues to run - as it began - purely on a volunteer basis.

Its aims include

- \* the promotion of mathematical education to government through lobbying,
- \* the development, application and dissemination of mathematical knowledge within Canberra through in-service opportunities, and
- \* facilitating effective cooperation and collaboration between mathematics teachers and their colleagues in Canberra.

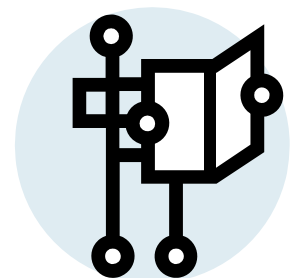
We're on the Web!

<http://www.canberramaths.org.au>

## THE 2012 CMA COMMITTEE

President	Erin Gallagher
Vice Presidents	Jurek Paradowski Sue Wilson
Secretary	Theresa Shellshear
Treasurer	Paul Turner
Councillors	Claire Hirschfeld Heather Wardrop Andy Wardrop Toby Hartley Evelyn Ashcroft Jo Kellow Patricia Tandy Jeffery Mansfield Peter McIntyre Igraine Ridley-Smith

Hawker College
Calwell High School
Australian Catholic University
Australian Catholic University
Erindale College
Lyneham High School
Lake Tuggeranong College
Erindale College
Hawker College
Melba Copland Secondary School
Stromlo High School
Melrose High School
Melrose High School
University of NSW—ADFA
Calwell High School



**Find us on Facebook**

<http://www.facebook.com/pages/Canberra-Mathematical-Association/110629419011275>

# MATHEMATICS CURRICULUM IN THE ACT—FRACTIONS Erin Gallagher

## Fractions, MYMC, the Australian Curriculum and YOUR SCHOOL

<http://www.australiancurriculum.edu.au/Mathematics/Curriculum/F-10>

The following table is a brief extract of fraction related concepts as mentioned in the Australian Curriculum - Mathematics.

	<b>Half Family</b> Half, quarter, eighth	<b>Third Family</b> Third, sixth, ninth	<b>Fifth Family</b> Fifth, tenth	<b>Notes</b>
<b>Year 1</b>	Recognise and describe one-half as one of two equal parts of a whole Tell time to the half hour			Half only
<b>Year 2</b>	Recognise and interpret common uses of halves quarters and eighths of shapes and collections Identify and describe half and quarter turns			Half family (1/2, 1/4, 1/8)
<b>Year 3</b>	Model and represent unit fractions including 1/2, 1/4, 1/3, 1/5 and their multiples to a complete whole	Model and represent unit fractions including 1/3 and their multiples to a complete whole	Model and represent unit fractions including 1/5 and their multiples to a complete whole	Third family (1/3) Fifth family (1/5)
<b>Year 4</b>	Investigate equivalent fractions used in contexts Count by quarters and halves including with mixed numerals Locate and represent these fractions on a number line Make connections between fractions and decimal notation.	Investigate equivalent fractions used in contexts Count by thirds including with mixed numerals Locate and represent these fractions on a number line Make connections between fractions and decimal notation.	Investigate equivalent fractions used in contexts Recognise that the place value system can be extended to tenths and hundredths Make connections between fractions and decimal notation.	Fifth family (1/10, 1/100) First mention of fraction notation in the curriculum here with reference to comparing to decimals. Counting by unit fractions and size and shape but no calculations mentioned yet.
<b>Year 5</b>	Compare and order common unit fractions and locate and represent them on a number line. Investigate strategies to solve problems involving addition and subtraction of fractions with the same denominator.			First mention of addition and subtraction with fractions, only within the same denominator.
<b>Year 6</b>	Compare fractions with related denominators and locate and represent them on a number line. Solve problems involving addition and subtraction of fractions with the same or related denominator. Find a simple fraction of a quantity where the result is a whole number, with and without digital technologies. Make connections between equivalent fractions, decimals and percentages.			Comparisons, addition and subtraction within fraction family. Fractions of collections.

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## SHORT CIRCUIT

## VOLUME 2, NUMBER 2

With a number of primary schools in the ACT continuing with the Middle Years Mental Computation (MYMC) program and using its approach to introduce the basic and fundamental concepts regarding fractions; I thought that an explicit look at all the fractional components brought together might be of benefit to spark some discussion.

This article is not intended to provide you with the answers, nor a fractional teaching program for primary schools, but for use as a focal point for conversation within your school around how you might develop a school wide approach to addressing fractional understanding.

What follows here, would be one point that I might make if I were to participate in your school discussion. Do you agree? Do you disagree? Why? What do your teaching partners think? Do you have a common belief and approach?

***My point:** From the above synopsis, it might be reasonable to adopt a slow and gradual development of real fraction sense over years 1-4. With computations using fractions not required at this stage, it is a real opportunity to develop deep understanding of our 3 basic fraction families; Half, Third and Fifth. With formal notation not explicitly mentioned until year 4, it is also a great opportunity to reduce fraction fatalities where students liken our symbolic representation of fractions to separate whole number systems, the kind where mistakes like this happen...  $1/2 + 1/3 = 2/5$ .*

Some points that might be worthy of discussion with your colleagues:

How do we develop a concept of size and name?

How can students make and name fractions and describe the relationship to others?

How can they compare?

How can they explain why one fraction might be larger than another?

How could they prove it?

How can they carry out simple additions within the same fraction group mentally and with simple manipulatives?

How can they engage in a conversation, argument, dialogue or narrative about the fractions in abstract and in some context?

AND

How can they do all of this before the introduction of symbolic notation particular to fractions?

All the best with your fraction discussions, I'd love to hear how it goes. Drop me a line.

Erin Gallagher

[erin.gallagher@ed.act.edu.au](mailto:erin.gallagher@ed.act.edu.au)

Interested in more about fractions, you might find the following interesting reads:

McIntosh, AJ & Dole, S (2004) Mental computation: a strategies approach, Modules 1-6,

Department of Education, Tasmania

McIntosh, A. (2005). Developing Computation. Hobart: Department of Education, Tasmania.

McLeod, Rachel & Newmarch, Barbar (2006) Fractions <http://www.scribd.com/doc/48505708/fractions-booklet>