



Mathematics Council NEWSLETTER

The Alberta Teachers' Association

Volume 30

Number 1

January 2012

President's Message

As 2011 comes to a close, I reflect on the changes in pedagogy, assessment and philosophy in the new math curriculum. Although there have been dramatic changes over the last few years, some things remain constant.

Over the past year, it has become increasingly clear to me that some interpretations of the new curriculum have left gaps in students' mathematical learning. One area students and teachers struggle with is basic math facts.

There has been ongoing discussion and concern about the new curriculum and basic math facts. The understanding is that students no longer need to learn basic facts. However, basic facts are, in fact, addressed across the grades and within the Number strand of the curriculum. The belief that basic math facts are not integral to mathematical learning is not correct.

I would like to share two examples from the program of studies to demonstrate the inclusion of basic math facts:

- "Apply mental mathematics strategies and number properties . . . for basic addition facts and related subtraction facts" (Grade 3, Number, Specific Outcome 10). This implies developing fluency with the basic facts since it is a mental math strategy.
- "Describe and apply mental mathematics strategies . . . to determine basic multiplication facts to 9×9 and related division facts" (Grade 4, Number, Specific Outcome 5) and "Apply mental mathematics strategies . . . to determine, with fluency, answers for basic multiplication facts to 81 and related division facts" (Grade 5, Number, Specific Outcome 3).

Both of these outcomes clearly express the necessity of developing fluency with the basic facts.

The new curriculum does suggest that the old-school method of "drill and kill" may not be the only or the best way to develop basic fact fluency. One strategy students respond to is the implementation of math games. Games specific to developing fluency with basic math facts can engage learners and maintain that engagement over the long term.

Computers and calculators have, for the most part, replaced the old paper and pencil and the slide rule, but number sense and, by extension, fluency with basic math facts will never be out of style.

And remember: If you can do math, you can do anything!

Marj Farris

From the Editor's Laptop

Although this is my first effort as editor of the *Mathematics Council Newsletter*, I am not new to the MCATA executive. I was first introduced in November 2010, as the Dr Arthur Jorgensen Chair Award recipient. After an enjoyable year becoming familiar with the ins and outs of the executive, I was given the opportunity to stay on as newsletter editor.

Still employed by the small Tyndale Christian School, I enjoy my job teaching a wonderful group of kids. And as much as I love math, my life always remains exciting with a course load that involves anything from CTS design courses to K-2 physical education to Pure Mathematics 30.

Until next time, happy teaching!

Karen Viersen

Fall Symposium Summary

On October 20, about 80 mathematics leaders and teachers joined Dan Meyer at MCATA's Fall Symposium. Dan is known across North America for his presentations on perplexity as a valuable currency in the math classroom. When students are perplexed, they aren't asking "When will we use this in real life?" because they are too busy chasing down answers to the rich math questions they come up with themselves.

Through YouTube videos, TV clips and movies, Dan modelled a three-step process for engaging students in thinking about mathematical concepts through the use of multimedia. He uses a hook to get students asking questions that lead to rich mathematical conversations and experiences. His three-act pedagogy model draws in every learner and helps teachers know when to give students help and when to get out of their way and let them drive their own learning.

Participants left with a model for designing math problems using digital media to challenge students while they are having fun. The goal is to have students understand and enjoy the power of math in the world around them.

Conference 2011

The 2011 MCATA annual conference at the River Cree Resort went well. On Thursday, October 20, over 250 delegates listened to David Coffey explain the importance of "road signs" as we venture down the "road less travelled." On Friday, Dan Meyer showed us the importance of making math relevant and engaging through real-life application. In breakout sessions, Alberta Education representatives spoke about the assessment of the new curriculum and math educators from around the province shared their creative and innovative ideas. The Thursday-night social, with full support from McGraw-Hill, was also a success as delegates networked and enjoyed a math cupcake.

We hope to see all of you at Conference 2012 in Jasper, as either delegates or presenters. We are already accepting session proposals.

David Martin and Rod Lowry

MCATA Meetings

September Executive Meeting

Most of this meeting was spent finalizing plans for the fall symposium and the annual conference. The number of registrants was a concern as our conference was the same weekend as two other major conferences. Presenters were confirmed for the Beginning Teachers' Conference in Edmonton in early October. The executive asked the president to look into joint conferences—strictly as research, not as a commitment. The criteria for the newsletter editor position were drafted.

October AGM

President Marj Farris chaired the annual general meeting and Andrea Berg served as ATA staff advisor. The financial report ending June 30, 2011, was approved as presented. Attendance at the fall symposium and annual conference was reported. To increase membership, everyone was asked to encourage five colleagues to join MCATA using TNET. Plans for the spring symposium were shared. The proposed budget for 2011/12 was accepted as printed. Rod Lowry was elected vice-president, with professional development as his focus, and Christopher Smith was elected treasurer. Both positions are for two years. Two motions were passed: the first recommended that the president write to Alberta Education regarding the weighting of mathematics diploma exams in 2013, and the second recommended that written-response questions be reinstated in both the PATS and the diploma exams in math.

November Executive Meeting

Some of the meeting was spent discussing the annual conference in October and doing initial planning for the 2012 conference. Executive members were encouraged to spend one session at the specialist council booth at their teachers' conventions. The webmaster was asked to include links to sites that are useful for teachers. For registration for the spring symposium, MCATA will complete a trial of Event Wizard. Event Wizard, approved by the ATA, is an online registration program that allows registrants to pay fees using a credit card. If all goes well, Event Wizard will also be used for the 2012 conference. Karen Viersen was appointed newsletter editor, and David Martin and Tancy Lazar were appointed Conference 2012 cochairs. Paul Bechthold was welcomed to his first executive meeting as the Dr Arthur Jorgensen Chair Award recipient for 2011/12.

Alberta Education Update

The Seven Mathematical Processes: Mental Math and Estimation

Mental mathematics and estimation are fundamental components of number sense.

Alberta Mathematics Program of Studies

Mental mathematics is a combination of cognitive strategies that enhances flexible thinking and number sense. It involves using strategies to perform mental calculations and improves computational fluency by developing efficiency, accuracy, and flexibility in reasoning and calculating.

Estimation is used for determining approximate values or quantities, usually by referring to benchmarks or referents, or for determining the reasonableness of calculated values. Estimation is also used to make mathematical judgments and to develop useful, efficient strategies for dealing with situations in daily life.

Here are a few ideas for developing students' mental mathematics and estimation skills:

- Learn about the strategies your students are using and encourage them to develop other strategies.
- Model mental mathematics strategies for your students. Talk about your thinking processes as you apply a strategy and help students do so as well.
- Provide opportunities for students to practise their strategies.
- Ask your students:
 - How did you calculate the solution?
 - Is your answer reasonable?
 - Would that strategy work in all situations?

Mental mathematics and estimation supports students in developing and deepening their understanding of mathematics.

Website

Visit www.education.alberta.ca/math/ to access the programs of study, assessment standards, an easy-to-use authorized resource list, videos, fact sheets, a PowerPoint presentation on the new course sequences and other materials.

Postsecondary Acceptance

Both the University of Alberta and the University of Calgary will accept Mathematics 30-2 as an entrance requirement for their nursing programs.

Critical Information: Applied and Pure Mathematics 30

Applied and Pure Mathematics 30 will no longer be offered as of the 2012/13 school year. A fact sheet outlines the options should a student not be successful in either course by the end of the 2011/12 school year. The fact sheet is available at http://education.alberta.ca/media/6571950/math30_critical.pdf. Please give the fact sheet to students and parents and share it with administrators, guidance counsellors and other teachers.

Provincial Assessment Update

Information sessions on the new Mathematics 30-1 and 30-2 diploma exams are being offered through the Alberta Regional Professional Development Consortia this school year. Participants will be able to see draft blueprints and sample items and to develop machine-scored items for their classrooms. Contact your local PD consortium (www.arpdc.ab.ca) for session dates.

Information bulletins and assessment standards and exemplars will be posted in both English and French in spring 2012. These documents will contain exam blueprints, notes for teachers, assessment standards, formula sheets and sample questions. Sample questions will also be posted on Quest A+ (<https://questaplus.alberta.ca>) by fall 2012.

To be added to the committee list for 2011/12, submit your name, via your principal, to your superintendent. Nominations are accepted throughout the school year, and there will be numerous opportunities to write items, validate field tests and validate diploma exams.

New Executive Member

Dr Arthur Jorgensen chair Paul Bechthold was raised in small-town Alberta, in Strathmore. He was lucky to have several excellent math teachers, part of his inspiration for becoming one himself. Since high school, he has lived in Calgary, where he completed an undergraduate degree in mathematics with a particular interest in applied mathematics.

Paul will be a certificated teacher this April. His MCATA executive position will allow him to look behind the curtain of math education and find ways he can uniquely contribute. He enjoys planning courses with colleagues to create differentiated, project-based learning experiences. He also looks forward to teaching shop classes and hopes to organize running, chess and finance clubs.

NCTM President Coming to Alberta!

You are cordially invited to the MCATA Spring Symposium for leaders in mathematics education, to be held May 4, 2012, in Calgary.

In “Infusing the Classroom with Reasoning and Sense Making,” National Council of Teachers of Mathematics (NCTM) president Mike Shaughnessy will speak on the importance of focusing on student reasoning about mathematics.

Reasoning is student-centred. It begins with students themselves. Listening to student thinking is critical because it provides feedback on the what, how and why of students’ thinking. Students should be encouraged to question, experiment, estimate, explore and suggest explanations. As the NCTM report *An Agenda for Action* (1980) states, “Problem solving, which is essentially a creative activity, cannot be built exclusively on routines, recipes, and formulas” (p 4).

Mike will provide strategies for having students do the following:

- Explain their thinking
- Believe that mathematics makes sense
- Make and evaluate mathematical conjectures and arguments
- Appreciate the power of reasoning as a major part of mathematics
- Construct proofs of mathematical assertions

He will share his ideas on the importance of not only developing student reasoning but also assessing it, and he will help teachers link research to practice.

Mike has made “Infusing the Classroom with Reasoning and Sense Making” a goal for his term as NCTM president. He will inspire all educators with his practical ideas to get students to do the thinking and reasoning in the math classroom.

Don’t miss this opportunity to hear Mike Shaughnessy in Calgary! It is one of few opportunities for Canadian educators to hear his message.

Register at www.mathteachers.ab.ca.



Award Winners

Dr Arthur Jorgensen Chair Award

While completing a bachelor of science degree in mathematics, Dr Arthur Jorgensen Chair Award winner Paul Bechthold discovered that he had a passionate interest in the abstract nature of mathematics. He chose to pursue mathematics, he said, “because it is the language my brain wants to speak.” Aware of the importance of translating the abstract to the concrete for students, he strives to create engaging lessons that teach students the basics of math before they even realize it, and he believes that students need to be convinced that math is relevant to their lives. Paul welcomes becoming part of a community that will improve his ability to teach enjoyable and influential lessons.

Math Educator Award

There was no Math Educator Award winner this year. Please consider your math colleagues and nominate someone who excels in this area. We accept nominations for elementary teachers, secondary teachers and division/school leaders. Winners receive a plaque and an MCATA conference registration.

ATA Educational Trust Grants

Congratulations to Giacomo Guercio, Miriam Hick, Mark Mercer and Jessica Quinlan, who each received \$400 to attend the MCATA annual conference. The application form for the next round of grants is available at www.teachers.ab.ca (under For Members, click Grants, Awards and Scholarships, then ATA Educational Trust). The application deadline is September 30, 2012.

TERM Meetings

Teachers of Mathematics in the Edmonton Region (TERM) will be meeting on March 5 and May 7. The meetings will be held at Paul Kane High School, in St Albert, at 5 PM in Room 224 (on the north side of the building). For more information, e-mail donnaajc@telus.net.

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