Mathematics Council
NEWSLETTER
The Alberta Teachers' Association

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President's Message

In an effort to provide better service to our members, we did a membership survey in January. Thank you to the 155 of you who completed the survey. We learned about you, and you gave us some great feedback on how we are doing. Here are some of the survey results and what the implications might be for us.

Who Are MCATA's Members?

- MCATA members teach all grade levels, but almost two-thirds teach secondary (Grades 7–12).
- MCATA members have a wide range of teaching experience, from brand new to extremely seasoned. We assume that means we have a wide age range too, but we were far too polite to ask that question.
- Fifty per cent of you are new members within the past five years.
- Science is the most commonly taught subject in addition to math.
- Members overwhelmingly (98 per cent) know that they are eligible for a no-cost membership for MCATA.
- MCATA members tend to use Facebook for fun but not for work.
- One-third of our members use Pinterest. MCATA's publicity director (my second role on the council) is going to have to learn to use it, too.
- Website, e-mail and newsletter are the ways you want to hear from us.

The fact that you want to hear from us by e-mail is fantastic. Our mass e-mails are going out to more than 1,000 people, but they are being opened by fewer than 500. If you are not receiving e-mails from us, it's likely one of two problems. Either your spam filter is tripping us up, or we do not have the correct e-mail address for you. E-mails to and from us originate from mathcouncilata@gmail.com. If you add us to your address books, we should get past the spam filters. If we're still not reaching you, please send us an e-mail and we will add you to our distribution list. All e-mails are sent in compliance with Canadian antispam legislation, and you can opt out of receiving commercial e-mails at any time.

Feedback You Gave Us and What We Are Doing

- You want digital rather than print newsletters. We are on it. If you are reading this newsletter in print form, someone other than us printed it for you. Newsletters will be distributed electronically only from now on.
- While conference remains your preferred venue to learn with us, there is a strong appetite for adding smaller, regional events. We are exploring that possibility and hope to have more of these types of events. One idea we are exploring is asking some of the highly popular speakers from our annual conference to present workshops in various regions across the province. We have already added two regional events to this year's calendar. By the time you read this, we will have had a math evening in Calgary with Simon Goodchild from Norway, on April 27, and a formative assessment symposium in Red Deer, on April 29.
- Despite an increase in attendance at our conference when we go to the mountains, members indicate that they prefer conferences in Edmonton and Calgary. Therefore, we will continue to rotate our annual conference among various locations. In October 2016, we will be in Canmore. The following year it's back to Edmonton. In 2018, we are considering another joint conference with the Science Council.
- About one-third of MCATA members indicate an interest in an ed camp–style conference. We are open to this idea—we may try one out soon, or integrate some ed camp sessions into our annual conference.

John Scammell

From the Editor

We know that math is beautiful, but sometimes our students don't believe us. If you need some help convincing them, just check out Hamid Naderi Yeganeh—specifically the article by *Discovery News* (http://news.discovery.com/tech/gear-and-gadgets/math-artist-finds-beauty-in-equations-photos-160414.htm) (accessed May 4, 2016).

Enjoy!

Karen Bouwman

Awards

Dr Arthur Jorgenson Chair Award

Had a great student teacher this year? Get him or her to apply! The form can be found on our website, www.mathteachers.ab.ca, under the About Us tab.

Math Educator of the Year

Once again we are looking for teachers who cause the Eureka! moments, the ones that students talk about around the campfires, saying "I finally got math!" If you know one of these, please nominate him or her for this award using the form found on www.mathteachers.ab.ca in Grants/Awards under the About Us tab.

C3—Current Commentary by the Council

David Martin discusses the continuing conversation about how mathematics is taught.

Math Wars Confusing Curriculum and Pedagogy

Recently there have been a lot of false statements in the media about the WNCP curriculum, and consequently these attacks come down on teachers. Before I continue, I will explain two important words in the educational world.

Curriculum: This is simply *what* a teacher needs to teach. For example, a Grade 3 student needs to be able to recall and understand up to 5×5.

Pedagogy is *how* the teacher teaches—for example, using direct instruction, peer coaching, PBL [problem-based learning] and so on.

Contrary to social media, presentations and other means of critiquing the curriculum, the curriculum does not say

- how teachers need to teach the outcomes;
- that discovery learning is a must—in fact, the word *discovery* does not appear once in the entire document;
- "21st-century skills development" and "experiential learning"—neither of these phrases appears in the document; or
- that students should not be memorizing their basic facts.

Keep in mind that the curriculum is the *what*, not the *how* or even the *with what*.

Recently, an event about public education was held in Calgary at a private, gated school. The event was designed to inform parents of "the best practices in math." While the event was designed to encourage change at the government level, make no mistake—this was a blatant attack on math teachers in Alberta and on other teachers in provinces that follow the same curriculum.

Here is one of their recommendations:

8. Include Direct Instruction as a Teaching Strategy

- Direct instruction is essential to provide the transfer of information, explanation and practice in a reasonable time frame.
- Ministerial order of May 6, 2013 imposes one model of instruction on all. This needs to be rescinded.

Now, as you have seen, "Teaching Strategy" falls not under curriculum but actually under pedagogy. The irony is that I am sure all teachers, at some point, do

some direct instruction; this slide almost paints the picture that teachers are simply sitting around hoping that students will learn math through osmosis. Also, there is no "imposing of one model of instruction." I have had the honour of being in many math classrooms around the province, and I can attest that teachers have balance. Enter a classroom and you will see that teachers truly implement strategies that are the most beneficial based on the classroom make-up and the outcome(s) being taught.

Next we have "Some things to watch out for":

Some things to watch out for

- Be wary of phrases: conceptual understanding, critical thinking, 21st century skills, experiential learning, "research shows"
- No one is arguing for only memorization and procedures
- Memorizing times tables and practicing procedures does not interfere with understanding (false dichotomy)
- Understanding is important but not more than skill
- Understanding ≠ multiple strategies, using convoluted methods for arithmetic or open-ended problems

Of course some of these points make sense. We should be wary of many phrases, because their intent could be misunderstood. Also, in reference to the second point, no one is arguing against memorization and procedures.

As to the third point, I have not met one person who suggests that students should not memorize their math facts. The difference is, however, that students should memorize these facts out of application and use, not out of necessity.

This means that teachers should show students math in a context and for a purpose, and the memorization will occur. Have students roll dice, play cards and board games and so forth, because most (if not all) games have some link to reasoning, logical thinking and mental mathematics.

"Understanding is not more important than skill"—this is again in reference to the actual art of teaching in the classroom. I have yet to meet one teacher who denies that skill is useful, but let's remember that if we focus only on skill, then [lack of] learning can be disguised with simple memorization.

So why is there such an attack on the curriculum?

I believe it is because some are confusing the terms *curriculum* and *pedagogy* and also because we have a generation (parents) who learned math through memorizing algorithms and are confused about why their own children are not coming home with the same algorithms. Recently, however, some parents are now seeing the benefit of the change.

Also, some critics cite the drop in PISA scores; however, there has been no actual evidence that this drop has been caused by curricular changes.

MEMORIZING LEADS TO LITTLE UNDERSTANDING

UNDERSTANDING LEADS TO A LOT OF MEMORIZING

The confusion, for a child, might start when a child is learning one way at school, and then coming home to hear that the strategy is not right. We must also realize that teachers are trained education professionals. These professionals implement effective instruction based on the individual needs of the students. It is unfortunate that some want to see the art of teaching be simply a procedural task of "tell students what to do, ask students to imitate the learning, repeat."

If you have a question about the math your child is learning, phone the teacher. Social media, news and other hands not involved in K–12 education have a way of distorting the truth. Keep in mind that teachers are trained to teach your child math in a way that is meaningful and to create a passion for numbers.

I remember back when I was in school that there were immense numbers of people who hated math. It seemed as if math was the number-one hated subject in school. (No research—simply guessing here). Isn't it time this changes? Isn't it time we cultivate passion and number sense?

Math class needed a change, and this change is healthy. There is now balance. Before, there was a focus to teach math one way, and all students were required to learn that one way. Finally, alternative efficient strategies are not only accepted but encouraged! We are allowing students to not only learn math, but actually like it!

David Martin

This article was originally posted on David Martin's blog, http://realteachingmeansreallearning.blogspot.ca, in February 2016. Opinions expressed herein do not necessarily represent those of the Mathematics Council of the Alberta Teachers' Association or of the Association itself. Minor amendments have been made in accordance with ATA style.

Useful Information from Alberta Education

In September 2015, Alberta Education clarified the expectations of the *Alberta Mathematics Kindergarten to Grade 9 Program of Studies* by revising the *Alberta K–9 Mathematics Achievement Indicators* (2015) resource. This resource was updated to include standard/traditional algorithm achievement indicators in the Grades 2 to 5 number strand. Achievement indicators provide samples of how students may demonstrate their achievement of the learner outcomes in the mathematics program.

Alberta Education also created a new fact sheet, Sample Standard/Traditional Algorithms, aimed at supporting teachers in the implementation of the K–9 math program of studies. The fact sheet provides samples of standard/traditional algorithms for all four operations (addition, subtraction, multiplication and division).

A list of additional support resources for the K–9 math program of studies was developed in collaboration with teachers and administrators throughout Alberta to provide further support for the K–9 math program of studies. The most recent additions to the list were added in March 2016.

Professional Development Opportunities

In the 2015/16 school year, a series of learning opportunities was offered across the province through the Alberta Regional Professional Development Consortia (ARPDC) to teachers and preservice teachers. These learning opportunities will extend throughout the 2016/17 school year and beyond. Check the ARPDC Learning Portal or contact your regional consortium for updates and registration.

Alberta Education is focused on continuous improvement and is using feedback to further refine our K–9 mathematics curriculum. The ministry is working to systemically improve factors that contribute to the successful implementation of the math program in classrooms across Alberta.

As we move forward, this work will include

- additional clarifications to the program of studies and achievement indicators,
- identifying additional support resources for teachers,
- establishing jurisdictional math contacts to directly share updates with teachers,
- reinforcing number facts and operations through provincial assessment,
- analyzing considerations that contribute to greater student achievement by reviewing school jurisdiction results as part of the annual education results report and
- initiating a dialogue with the deans of education to explore options to better prepare our faculty of education students to deliver effective math programming at elementary grade levels.

If you have any questions about the mathematics program, please contact

- Kathy McCabe, team leader, mathematics, at kathy.mccabe@gov.ab.ca or 780-422-5079 or
- Diane Stobbe, French team leader, mathematics K–12, at diane.stobbe@gov.ab.ca or 780-427-7489 (dial 310-0000 first for toll-free access in Alberta).

Assessment

Diploma Programs

- Mathematics 30-2 will be releasing additional diploma exam items this fall. All released materials for the mathematics diploma examinations can be found on the Alberta Education website at https://education.alberta.ca/mathematics-10-12/diploma-exam-exemplars/, as well as on Quest A+ at https://questaplus.alberta.ca.
- Assessment highlights from last year's diploma exams can be found in the commentary section in the Mathematics 30-2 information bulletin.
- Final minor adjustments will be made to the *Mathematics 30-2 Assessment Standards and Exemplars* document, which will then be posted in the fall of 2016.
- Mathematics 30-2 will continue to offer year-end field tests and topic field tests, all 60 minutes in length. The year-end field tests will be offered in both digital and hybrid formats. The two topic field tests, logical reasoning and probability, and relations and functions, will be offered in digital format only. The year-end field test, 180 minutes in length, will no longer be offered due to low participation.

For more information, please contact Jenny Kim, team leader, Mathematics 30-2, Provincial Assessment Sector at jenny.kim@gov.ab.ca or 780-415-6127 (dial 310-0000 first for toll-free access in Alberta).

Mathematics Council
of the Alberta Teachers' Association
presents

"Opening Your Mathematical Mind"

The annual fall mathematics conference, October 21–22, 2016

On-site registration begins Thursday evening, October 20, 2016

Coast Canmore Hotel and Conference Centre

511 Bow Valley Trail, Canmore, Alberta

Visit our website: www.mathteachers.ab.ca

MCATA is the Mathematics Council of the Alberta Teachers' Association. Its mission is to provide leadership to encourage the continuing enhancement of teaching, learning and understanding.

Keynote Speakers

Peter Liljedahl, Simon Fraser University

Peter Liljedahl, PhD, is an associate professor of mathematics education in the Faculty of Education and an associate member in the Department of Mathematics at Simon Fraser University, in Vancouver, British Columbia. He is the coordinator of the MSc program in secondary mathematics education, which is a unique collaboration between the Faculty of Education and the Department of Mathematics; he is affiliated with the PhD program in mathematics education and is a codirector of the *David Wheeler Institute for Research in Mathematics Education*.

More globally, Peter Liljedahl is currently the vice-president of the *Canadian Mathematics Education Research Group* and the lead editor of the proceedings of that group's annual meetings. He is a former member of the international committee of the *International Group for the Psychology of Mathematics Education* and currently on the editorial board of the international journals *Mathematical Thinking and Learning* and the *Canadian Journal of Science, Mathematics and Technology Education*.

Peter Liljedahl is a former high school mathematics teacher who has kept his research interest and activities close to the classroom. He consults regularly with schools, school districts and ministries of education on issues of teaching and learning, assessment, and numeracy. He is also a member of the executive of the British Columbia Mathematics Teachers Association (BCAMT) and coeditor of their flagship journal, *Vector*.

Ilana S Horn, Professor, Department of Teaching & Learning, Vanderbilt University Peabody College of Education and Human Development

Ilana Horn's work is motivated by the underperformance of American secondary students in school mathematics. Her research centres on ways to make authentic mathematics accessible to students, particularly those who have historically been disenfranchised by their educational system. She focuses primarily on mathematics teaching in two ways: first, she looks at classroom practices that engage the most students in high quality mathematics; second, viewing teaching as a situated practice, she is interested in how school environments, communities, colleagues and policies shape what is instructionally possible. Her scholarship lies at the intersection of mathematics education, learning sciences and the sociology of teachers' work.

Horn's research projects have spanned questions of inservice teachers' professional learning, preservice education, district level instructional improvement and students' experiences of different forms of mathematics instruction. These projects implicate the way teachers' work is organized in supporting the best forms of instruction for students. Theoretically, she draws on ethnomethodology and sociocultural studies of learning. Methodologically, she conducts comparative case studies with discourse analysis as a tool to understand local meanings.

(Adapted from http://peabody.vanderbilt.edu/bio/ilana-horn)

The link for registration is https://event-wizard.com/OpeningYourMathmind/0/welcome/.
Speaker proposal forms can be found on the website www.mathteachers.ab.ca under the Conference tab.