Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago Volume XLVIII No. 2 Oct. 2018

The Wonders and Joys of Mathematics and Statistics: Catalyzing Change in School Mathematics

on Friday, November 16, at the Des Plaines Elks Club, 495 Lee Street, Des Plaines, and then continue the experience by attending Gail's Saturday workshop

Using Inquiry to Build Thinking Classrooms

on Saturday, November 17, at Glenbrook South HS, 4000 W. Lake Street, Glenview.

November Speaker Gail Burrill





Friday, Nov. 16, 2018 Doors Open/Social Hour: 5:45 PM Dinner & Talk: 7:00 PM

Des Plaines Elks Club 495 Lee Street, Des Plaines \$30 for Members, \$35 for Nonmembers

Reserve by noon, Monday, Nov. 12 Online at www.mmcchicago.org or by phone at 847-486-4291 According to NCTM, "Today's students face a future where there is an increasing need for mathematical skills in the workplace. As a high school teacher, leader, administrator, or counselor, part of your profession involves helping ensure that students are prepared for both personal and professional success." To address this, NCTM is pushing some very hefty goals. They are acknowledging the need for change in mathematics education and trying to help us all find our way through it for our students. The Catalyzing Change movement has several themes, including

- Broadening the purposes for teaching high school mathematics beyond a focus on college and career readiness
- Dismantling structural obstacles that stand in the way of mathematics working for each and every student
- Implementing equitable instructional practices
- Identifying essential concepts that all high school students should learn and understand at a deep level
- Organizing the high school curriculum around these essential concepts to support students' future personal and professional goals

On Friday, November 16, Gail Burrill will be introducing us to the Catalyzing Change movement with her talk, "The Wonders and Joys of Mathematics and Statistics: Catalyzing Change in School Mathematics." Gail wants us to identify challenges to ensure that every student has the mathematical experiences necessary for future personal and professional success. We could not have a better person for this. Gail is a risk taker and a deep thinker, who is willing to move away from the tried but no longer true. This movement is very much targeted at the high school curriculum. Things will be changing. You can be a leader and a knowledgeable participant who helps shape the change or be dragged along kicking and screaming, wondering where these new ideas all came from. We are so fortunate to have Gail at this moment in mathematics education history.

Points & Angles

The Wonders and Joys of Mathematics and Statistics (cont.)

Currently an Academic Specialist in the Program for Mathematics Education at Michigan State University, Gail Burrill was a secondary teacher and department chair in suburban Milwaukee, Wisconsin, for over 28 years. She received the Presidential Award for Excellence in Teaching Mathematics and the NCTM Lifetime Achievement Award, is an elected member of the International Statistics Institute, and served as President of the National Council of Teachers of Mathematics and as Director of the Mathematical Sciences Education Board. Burrill co-chaired the College Board Commission on the Calculus Framework and is currently chair of the College Board's Advanced Placement Calculus Development Committee. She directed the Teachers Program component of the Park City Mathematics Institute, is currently the President of the International Association of Statistical Education, and is a T^3 National Instructor. Her research interests are statistics education, the use of technology in teaching mathematics, and professional development for mathematics teachers.

This meeting will be at a new location, as we try to keep costs down. Yet with Gail Burrill, we are definitely keeping the quality at its maximum. The Friday night meeting will be at the Des Plaines Elks Club. We will have a family-style dinner that will start at 7 pm sharp. Doors will open at 5:45pm for socializing.

We will continue this wonderful experience on Saturday morning when Gail Burrill leads a workshop for us. The Saturday workshop will focus on developing a "thinking classroom."

What does a thinking classroom look like? What should it look like for all students? What are some strategies that make classrooms spaces where all students are actively engaged in thinking about and doing meaningful mathematics? Participants will do some math, explore what contributes to an environment focused on students and their learning, and examine the role of technology in this environment. They will also consider the messages in the NCTM document, *Catalyzing Change*, and how they are relevant for our work as teachers.

There are incredible prices for attending both events. Reservations for both events must be made and paid for ahead of time. All of this is done at our website mmcchicago.org.

Both events are truly a special opportunity only MMC can offer at such convenience, reasonable prices, and with such excellence. One more reason to be glad you're from Chicagoland.

Join Us on Saturday!

Saturday, November 17, 2018 Workshop: 9:30-11:00 AM

Glenbrook South High School 4000 W. Lake Street, Glenview

\$35 for members attending Friday and Saturday
\$40 for nonmembers attending Friday and Saturday
\$20 for members attending Saturday only
\$25 for nonmembers attending Saturday only

Reserve by noon, Monday, November 12 Online at www.mmcchicago.org or by phone at 847-486-4291 Special discount if you attend Friday and Saturday--You must register in advance to receive the discount!



Points from the Interior

by Mary Wiltjer

There are a lot of very exciting findings in brain studies related to mathematics. Jo Boaler's work does a nice job summing up much of it and pulling together important findings. The most hopeful is that anyone of any age of any gender of any race of any socio-economic background can learn mathematics. This means that the long and wrong held notion that some people are math people and some (actually most) are not is totally false. This idea, definitely perpetuated in schools across America, has possibly caused more destruction to mathematics education than anything else. How many students were convinced that all of mathematics wasn't available to them because they weren't a "math person"? It is such a common misconception to this very day that we lose so many. They may not exit courses before the end of high school, but I know they see math as something to survive or endure, rather than as a beautiful way to describe their world and their own experiences.

The sad part of the current findings is that one of the most powerful factors in mathematics learning is self-confidence. Because we often think of mathematics as a very objective area of study, it seems to be immune to emotional impact like self-doubt. But the truth is quite the opposite. Self-doubt has so much impact on brain chemistry that it literally thwarts learning, which is a naturally compounding problem.

Why are students doubting themselves? Because we are creating atmospheres in our classrooms and schools that encourage insecurity. We regularly reward fast mathematics or at a minimum don't stifle or discourage it. What do I mean? Do tests make students have to rush? Do you rationalize this is okay because if they really knew the material they could do it faster? Stress during testing, which time pressures inflate dramatically, lock up working memory. This is the part of memory that actually lets you pull some piece of info out of your memory. It is a fallacy that if you know something well, you can do it faster. Anxiety can lock up our ability to accomplish an otherwise doable task so that we are not revealing our full range of knowledge or understanding. What do we want to assess, speed at tasks or deep understanding? I now feel that if the first kid doesn't turn in my test with half the time left, then I have made my test too long. In my opinion the math section of the ACT is a horrible abomination in assessment--60 questions in 60 minutes. That isn't a math test but rather a speed-reading test. To give kids that many problems in so little time says that the nature of the problems must be based on rote responses and quick procedural steps, no richness and no depth to the problem solving. This test has only driven us to more curriculum that is as the cliché says, an inch deep and a mile wide. There is so much opportunity to feel like a failure on the ACT math test. Unfortunately, the real failure is both the test itself and the accepted popularity of the test.

One major way we tell students that they should not believe in themselves when it comes to mathematics is through the extensive use of levels or tracking that we have. Countries that are doing well in mathematics education do not separate students like we do, even in high school. We've convinced ourselves and constructed such intense systems that we only hold the door open the widest for a select number of students. Great research shows that we need drop the levels and teach kids in heterogenous groups. While I am very open to the changes our current research shows, this one gives me pause. I do believe it now, but it is so hard to picture these new classes. But because something is difficult should never be the reason we don't pursue it. Heck, isn't that just the perseverance we want from our student problem solvers?! I fear this is going to be the hardest misconception to let go, but we must. However, we have created so much structure on top of structure to separate kids into just the right path, it will be both difficult and threatening to many teachers to dismantle.

Far more must be done to truly open our doors to all learners and to accept them all as rich problem solvers. It will include massive overhauls of high school curricula, as well as rethinking who our learners are, their mathematical identities, and who we really want to be as the leaders in the classroom. I'm so happy that NCTM has shown the courage to address these changes in their new movement, *Catalyzing Change*. We can wait no longer. I encourage you to read NCTM's materials, see Gail Burrill address some of this at our next meeting, and reflect on how we are keeping the door shut, or at least not open wide enough, to so many of our learners.

September Dinner Meeting Talk – Sheila Hardin "Starting the School Year, Prepared to Fail at Teaching" by Beth Ann Ball

Sheila Hardin welcomed us to the new school year with an explanation of why failing at teaching is important. "If I am not failing at teaching, then I am not paying attention," Hardin stated in her opening remarks. Hardin described the 3 types of failure teachers experience every day and provided anecdotal evidence of how she experienced them in her classroom.

- 1. Failure in lesson planning
- 2. Failure to meet students where they are
- 3. Failure to know who is in the classroom

Failure in Lesson Planning: Sheila let the attendees work on a geometry problem that exemplified her first type of failure. The problem was from the January 1998 NCTM *Mathematics Teacher* calendar. We worked on it for about 10 minutes and few members had the complete solution. Sheila had planned 15 minutes for her geometry students, and it took the entire class period. While she "failed" in correctly planning how much time was required for the task, Sheila succeeded by making a responsive change in her lesson plan and let authentic discussions about problem solving and vocabulary result.



Failure to Meet Students Where They Are: Sheila provided the attendees another problem to solve: to sketch the graph of a function that met certain limit requirements. The graph crossed the end behavior asymptote close to the y-axis, which prevented many students from moving forward in this problem. Sheila did not initially realize that the problem the students had with the graph was the concept of a function being able to cross an end behavior asymptote. Once she realized the issue, she was able to move backwards and teach the students about the difference in horizontal versus vertical asymptotes and was then able to provide the learning experience she wanted from this problem.

Failure to Know Who is in the Classroom: Sheila gave two compelling examples. The first was mathematical: asking a probability question involving a deck of cards and remarking that many students have never played with a standard deck of cards in their lives. The second example involved students coming from swimming, where their skin reacted negatively to chlorine, and needing lotion in order to be comfortable enough to sit in the mathematics classroom for the next period. As a result, Sheila now keeps Band-Aids, lotion, Kleenex, hand sanitizer, and index cards in her room--any material needed to meet the students' needs that day. Sheila encouraged all of us to watch the TED Talk, "The Danger of a Single Story," by Chimamanda Ngozi Adichie.

Sheila then broke down the systems in her classroom into two major categories: those that are necessary and those that are not. The necessary systems need an academic reason to support their existence; without an academic reason, the unnecessary systems need to be removed. Sheila asked us to take a moment to reflect on a time we felt we had failed in our respective fields. She quoted Dylan Williams, "The only way to improve teacher quality is to create a culture of continuous improvement."

Sheila Hardin is a reflective, professional educator who came to share her message. She clearly stated, "Reflection is not wallowing in self-pity, is not judgmental, and is not filled with blame." In response to a question from the audience about systems for reflection, Hardin shared that making time for reflection is a part of her school day. After the students have left for the day, she sits quietly in her classroom to reflect upon the day and writes on Post-It notes what went well and what needs to be improved.

To close the talk, Sheila shared with us that after 24 years of teaching she is more optimistic in her role as a teacher than ever because she has learned to embrace and grow from her failure. "I am still learning. I am not done." This attendee went home and watched the recommended TED Talk. I, too, am optimistic for the new year.

COMING SOON: The MMC Conference of Workshops!

Save the date: Saturday, January 26, 2019, at the University of Chicago Laboratory Schools

The conference program books will be arriving soon and the program will also be on the MMC website.

Registration will open November 1, on the MMC website.

Remember that registration for workshops is done on a first-come, first-served basis, so register early!

Don't miss this!

USACAS 2019

MEECAS and Highland Park High School will co-host the 11th USACAS Conference. While still emphasizing CAS, this expanded **technology** conference will broaden our view of Computer Algebra Systems to include various technologies in mathematics, STEM, and science education. Our motto for the conference will be "find the right tool to solve the problem." This event will be held at Highland Park High School, located in Highland Park, Illinois, on Saturday, June 15, and Sunday, June 16, 2019. There will be an opening dinner on Friday, June 14, 2019, hosted by the Metropolitan Mathematics Club of Chicago (MMC).

Speaker proposals are now being accepted at usacas.org.

Registration: \$85 for USACAS 11 (before May 9, 2019; \$100 on or after May 9, 2019) \$95 for USACAS 11 AND the MMC Friday night dinner (before May 9, 2019; \$110 on or after May 9, 2019) \$55 for MMC Friday night dinner (before May 9, 2019; \$65 on or after May 9, 2019) (Fee includes continental breakfast, box lunch, and snacks)

NEW! Graduate Credit will be available through Central Michigan University.

Any questions can be directed to Ilene Hamilton at ihamilton2341@gmail.com.

In the September issue of *Points & Angles*, Nicolette Norris was incorrectly listed as the author of Zal Usiskin's talk summary. Tom Bond generously contributed that article to the newsletter. We regret this error. Thank you, Tom!



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MMC Board Report

By Beth Ann Ball

The MMC Board of Directors met on Tuesday, August 28, at Glenbrook South High School in Glenview.

The Board discussed the upcoming collaboration with ICTM and NCTM as Chicago prepares to host the 2020 NCTM Annual Meeting.

The MMC Conference of Workshops is set for January 26, at the University of Chicago Laboratory Schools.

This year, two dinner meetings, the November 16 meeting and the January 18 meeting, will be held at the Des Plaines Elks Lodge. This venue was selected to lower the dinner cost. Additionally, the June 14 meeting, which MMC is co-sponsoring with the USACAS Conference, will be at the Renaissance Hotel in Northbrook.

The 2018-19 speaker schedule has been confirmed, and Gail Burrill, Eli Luberoff, and Annie Fetter will be offering Saturday morning workshops on the days after they speak. These workshops will be held at Glenbrook South High School.

At the August 28 meeting, there were two MMC members in attendance to view a board meeting. Guests are always welcome! Please contact Mary Wiltjer at mwiltjer@glenbrook225.org, if you plan on attending. The next scheduled board meeting will be on Tuesday, November 27, at 6:30 PM at Oak Park-River Forest High School.

Call for Candidates!

By Matthew Moran

The MMC is seeking members to run for open positions on the Board of Directors and for the office of President. As a member on the board, you will have opportunities to serve on various committees to continue MMC's tradition as an outstanding professional organization. The high-quality, lowcost professional development that the Chicago area has come to depend on from MMC every year does not happen without a lot of hard work from our board. We need energetic MMC members like you to step up to do some of this work!

Having served on the board and as President, I can attest that it is truly rewarding work. Through serving on the MMC board, I have established relationships with great professionals in the field of mathematics education, and I have learned a great deal about how a professional organization and board of directors function.

If you are interested in running for an open seat on the board, please contact me (matthew.j.moran@gmail.com). I am happy to answer any questions you have about the open positions. If you aren't ready to serve on the board but know someone you think would be a good fit, please encourage them to contact me, or just send me a note and I can reach out.

MMC Dinner Meeting Incentive Program "Bring a Friend" Nights

Bring someone who has never attended an MMC dinner meeting, and introduce them to MMC! Both you and your guest will receive \$5 off your dinner cost. There is a limit of 2 guests per member per meeting for the reduced cost, but you can still invite more people to come with you! This incentive is good for the following meetings:

November 16 (Gail Burrill) January 18 (Matthew Moran)

Thank you to our generous members who are sponsoring this program.

Please be sure to register both yourself and your guest using the reservations link on the website and mention the incentive when you check in at the meeting.

Is your membership current? Check your mailing label to see when your membership expires. You can renew by mail with the form below or renew in person at the next dinner meeting.				
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Check the box below for electronic-only membership. You will receive an email with a direct link to each issue of <u>Points & Angles</u> when it is posted on the web site, often before paper copies are mailed. You will no longer receive <u>Points & Angles</u> by mail. ☐ Electronic-Only Membership FORM USE ☐ New Membership ☐ Former Member ☐ Change of Address * The student and 1 st -year teacher memberships are only available as electronic-only.	Check one: I year (\$35) Istur I year (\$55) Istur I year (\$55) Istruct MEMBERSHIP COST \$ DONATIONS SCHOLARSHIP FUND SPEAKER FUND \$	ed, 1 yr (\$22) ed, 1 yr (\$28)	Address Form IMC 339 W. Ibsen St. hicago, IL	
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Upcoming Events

Fri., Nov. 16	Gail Burrill	The Wonders and Joys of Mathematics and Statistics:
		Catalyzing Change in School Mathematics
Sat., Nov. 17	Gail Burrill	Workshop
Fri., Dec. 14	John Benson	Magnificent Mathematics: Some of My Favorite Problems
Fri., Jan. 18	Matthew Moran	The Robots are Coming for Your Teaching Job:
		Educational Ramifications in the Machine Learning Age
Sat., Jan. 26		MMC Conference of Workshops, UC Lab Schools, Chicago
Fri., Mar. 1	Eli Luberoff	Technology that Thinks WITH Students, Not FOR Students
Sat., Mar. 2	Eli Luberoff	Workshop
Fri., May 10	Annie Fetter	Sense-Making, Ideas, Curiosity, and Learning
Sat., May 11	Annie Fetter	Workshop
Fri., June 14	Tom Dick	Cubics, Conics, CAS, and a Curious Connection Called
		"The Most Marvelous Theorem in Mathematics!"
SatSun., Jun	e 15-16	USACAS Conference, Highland Park

Send upcoming event items to sburnett_308@yahoo.com no later than the date of the MMC dinner meeting preceding the issue in which the item should appear. All items are subject to editing.

Your membership renewal date appears in the upper right corner of the label



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