

Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago
Volume LI No. 6 May 2022

NCTM and a Century of Mathematics Education—A Review with Music

May Speaker
Zalman Usiskin



with Andrew Chukerman
Composer, Orchestrator, and Pianist

Friday, May 20, 2022

Doors Open/Social Hour: 6:00 PM

Dinner & Talk: 7:00 PM

**Fountain Blue Banquet
& Convention Center**

2300 Mannheim Rd., Des Plaines
847-298-3636

\$43 for Members, \$49 for Nonmembers

Reserve by noon, Monday, May 9
Online at mmcchicago.org

Important Note: All attendees must register online by noon on Monday, May 9.

Please make every attempt to register ahead of time as we have space concerns and want to make sure we have room for everyone who wishes to attend.

This presentation was scheduled for the large stage in the Arie Crown Theater at McCormick Place at the 2020 Chicago NCTM Annual Meeting that was aborted due to the pandemic, and this will be the first time it has been given. In it are many songs, some in their original form and some parodies, sprinkled throughout a talk that summarizes the major issues and movements in mathematics education in the last 110 years in the United States. What led to NCTM's birth in 1920 and in what way was MMC involved even back then? How did NCTM and mathematics education fare through the roaring 20s, the Great Depression, WWII, Sputnik and the new math, the 70s back-to-basics era, the 80s problem-solving movement, the NCTM Standards of the 90s, and the current effects of No Child Left Behind, the Common Core, and the striving for equity? Those who have heard Zal present math talks with music will hear two old favorites as well as five songs he has never before presented, performed with one of the best musical collaborators in the country, Andy Chukerman.

Zalman Usiskin is a professor emeritus of education at the University of Chicago, where he was an active faculty member from 1969 through 2007. In 1983, he helped initiate the University of Chicago School Mathematics Project (UCSMP), and he served as its overall director from 1987 until June of 2019.

Born in Chicago, Zal attended Von Steuben H.S., Illinois, Harvard, and Michigan. He taught full-time at Niles West and has taught full-year courses at the University of Chicago Laboratory School, Addison Trail H.S., Proviso West H.S., Rich South H.S., and Glenbrook South H.S., in each place writing and testing full-course materials that would later become mathematics textbooks.

May Dinner Meeting (cont.)

Zalman is the author or co-author of over 150 articles and other papers on mathematics and mathematics education, dozens of books and book-length research monographs, including textbooks and their teachers' editions for grades 7-12 and a college-level text *Mathematics for High School Teachers – An Advanced Perspective*. In 2014, NCTM published a book containing 38 of his talks and articles, the first time the organization published a collection of writings of one person. He received the Glenn Gilbert Award (now the Ross Taylor/Glenn Gilbert National Leadership Award) from the National Council of Supervisors of Mathematics in 1994, a Lifetime Achievement Award from NCTM in 2001, and the ISDDE Prize for Lifetime Achievement from the International Society for Design and Development in Education in 2018. Locally, he has received the Max Beberman Award from ICTM and Lifetime Achievement Awards from both MMC and ICTM.

Zal has spoken in every state of the U.S. and in 25 foreign countries. He has been the banquet speaker, presenting at the piano, at ICTM and twice for NCTM annual meetings. This will be the 28th time he has presented at an MMC meeting - a perfect number! - but the first time collaborating with Andy Chukerman.

Andrew Chukerman is a composer, orchestrator, and pianist born in Chicago who attended the Frances Parker School before attending Occidental College and ultimately moving to Los Angeles. Andy has been an accompanist for David Foster, Carole Bayer Sager, Diahann Carroll, and Maureen McGovern among many others, and was the arranger and keyboardist on Rod Stewart's Grammy-winning Great American Songbook Series, Vols. 1-3, and Carly Simon's Grammy-nominated "Moonlight Serenade". He has worked on the current HBO series, "Westworld", and multiple episodes of "Frasier", "Glee", "Murphy Brown", "Charmed", and "Rob Dyrdek's Fantasy Factory". He has received the Richard Rodgers Award from the Academy of Arts and Letters, the Jonathan Larson Award from the American Theatre Wing, The Edgerton Award, and Grand Prize for "Best Score" at the Rhode Island International Film Festival.

What Can Math Teachers Contribute to the Conversation About Equitable Grading?

By Sheila Hardin

Early arrivers at MMC's last meeting had the opportunity to examine a set of reports cards on the screen before Paul J. (PJ) Karafiol started his presentation on "What Can Math Teachers Contribute to the Conversation about Equitable Grading?". The report cards contained clues to the evening's interesting discussion on grading. Participants were invited to join a Peardeck, which allowed everyone to participate in the conversation throughout the evening.

PJ believes that math teachers can positively contribute to the conversation on equitable grading, especially in helping others understand that there are problems with the grading system that most schools are using. PJ asked the audience what observations they made from the two Lake View report cards besides the fact that one was from 1874 and the other from 2022. Historical facts (such as Lake View High School was not in Chicago in 1874) aside, the most obvious observation is that the report cards were basically the same. Grading systems have not significantly changed in the last 200 years.

Opening up the conversation on equitable grading PJ pointed out ways that grading practices can be inequitable. First, whether conscious or unconscious, grading can reflect a teacher's personal bias. For example, research has shown that neatly written assignments are given higher scores than messier papers with the exact same work and answers. Grading can also reflect or amplify systemic inequities that already exist both in and out of educational institutions. Finally, grading can rely on cultural norms that are not shared, taught or explicitly stated. PJ was clear that this conversation is not about people being "bad" but instead it is about the need to question the traditional 90-80-70-60-50 scale and our grading practices.



Karafiol Talk Summary (cont.)

Why math teachers? Because, as PJ stated, we are good at numbers, experienced at helping others understand numerical relationships and able to construct an argument while critiquing the reasoning of others. PJ asked the audience to consider, in a traditional scale, if a student gets an 85% on every assignment but the one they don't hand in, how many assignments does the student have to hand in to get a B in the class? The graphic below shows why 16 assignments would be required. PJ pointed out that it is sobering to consider that math teachers understand why so many are needed to balance the grade and yet people continue to assign zeros as they always have.

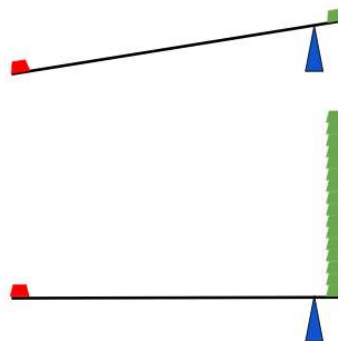
Why so many?

Computing a mean is finding a center of gravity—a balance point.

Here, we want the fulcrum to be at 80 (or higher).

The 0 is so far away from the fulcrum compared to the 85's that the mass at 85 has to be much greater to balance it out.

(16 times greater, by the way)



The answer could be to change the scale, assuring that the “0” is not so far from a passing grade of C. PJ presented several alternative scales; taking the time to point out how grades can easily be transformed between them. He also asked everyone to consider why we give grades and what are we hoping a grade to convey to the student. The group was asked to consider what is “pretty good” in other settings and if that phrase should reflect the complexity and importance of the task. For example, consider that the median percentage for getting a hit in a major league baseball game is 25% with last year’s record at 32.6%. Those players are paid thousands if not millions of dollars, but both of these percentages would be failing in most classrooms.

PJ took the audience on a journey through the statistics of grading such as sampling, validity and selection bias. As he went through the deeper conversations on what each of these bring to the grading issues we were discussing, it clearly led to more questions and more for people to consider. PJ pointed out that there are several reasons why people stick with the current system including the fact that people just think that numbers “mean something”. A common example for many of us is the difference between an 89 and a 90. Is there enough “meaning” to these numbers to award one student a B vs. an A?

In closing, PJ encouraged everyone to discuss the issues of a zero score with their colleagues and raise the issues of weighted categories and the magic “89”. There are no easy answers here, but the group was left with a lot to think about. Reflecting on grading should lead us all to question: Why are we attached to an old system if we want a new outcome?

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Points from the Interior

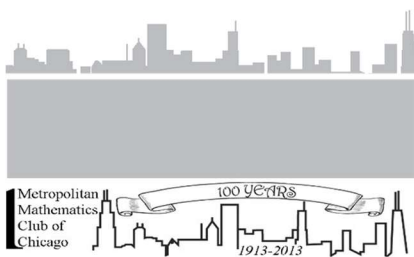
by Aimee Hart

As usual, I waited until the last minute to come up with a topic for my penultimate *Points from the Interior*. Just when I started to think that I had absolutely no new ideas, I ran into my son's former math teacher when we were both picking up our children from elementary school. We exchanged pleasantries about how our school years were going, and he mentioned he's been implementing some ideas from *Building Thinking Classrooms in Mathematics* by Peter Liljedahl and searched his phone to show me some pictures of student work. This was it! Last summer, I read *Building Thinking Classrooms*, and it has been transformational in my teaching. For a while, I was telling every math teacher I knew about it, and I even offered a workshop at the MMC Conference of Workshops about how I've implemented some of the practices in Geometry. How have I waited this long to write about it?

Building Thinking Classrooms was exactly what I needed to read last summer. We had just finished a year and a half of remote/hybrid, and my school was staying with the new block schedule we'd adopted during the pandemic. I knew it was going to take some time to get students talking and thinking about mathematics again. Before the pandemic, I'd become pretty good at finding or writing problems that will have an entry point for all students, have multiple ways to solve them and can lead to good mathematics discussion. But even with the best planned problem, I would still find that there were many students who didn't want to start it. As I'd walk around the room, some would tell me they were waiting for me to write out the solution because they didn't want to write something that was incorrect. If I put them in groups it was slightly better, and some groups would engage and argue, but students often fell into particular roles in groups. There was the student who everyone had deemed as the "smart one" and other students would just follow their lead, even if they were leading them in the wrong direction. And there were social dynamics that led to some groups struggling to communicate with each other.

I had students who were learning math and able to absorb difficult concepts and use them, but when I tried to get them to think about a new idea or persevere in problem solving, they often resisted. So, when I saw several math teachers post last summer about Peter Liljedahl's *Building Thinking Classrooms in Mathematics*, I bought it and read it right away. Liljedahl spent 15 years researching practices to "break through non-thinking behaviors and get students to think." What he produced from his research is an easy-to-read book of 14 practices that lead to more student thinking in the classroom.

While I can't summarize the entire book in this article, I wanted to mention two practices that have had a huge impact in my classroom this year and the benefits I've seen from them. The first is putting students into visibly random groups of three. Each time I do a thinking task, students are put into different random groups that they know are random and not groups I prepared ahead of time. This practice has helped eliminate set roles in the classroom. There is no longer the "smart" kid in each group who everyone else follows. Students who might have struggled one day on a task in a particular group are leading a different group the next day on another task.



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Points from the Interior (cont.)

It has also led to a better community in the classroom. Every student has worked with every other student at some point during the first quarter.

The second practice that has been transformational is having the students do their group work at Vertical Non-Permanent Surfaces (*i.e.* whiteboards and chalkboards). Having students work at the boards in groups has led to them beginning the problems more quickly. There is no anonymity when you are standing at the board; you can't just stand there hoping that I won't notice you and just wait for the right answer. You can try something and erase it which makes it feel less daunting to begin, and one of the best parts is students are less likely to pull out their cell phones when they are standing at a board with their group. It also makes it easy for me to quickly scan the room and see where each group is and who might need a hint or an extension. It also allows for groups to see what other groups are doing if they are stuck on a problem or compare answers when they have completed a problem. They rely more on each other and less on me.

I was so grateful to have found this book in the summer of 2021. Like many of you, I don't get a lot of time to read during the school year. I currently have a full shelf of books I've started and not finished, just waiting for summer vacation to begin! If you haven't read *Building Thinking Classrooms in Mathematics* and you teach in a K-12 setting or work with student teachers in that setting, I highly recommend adding it to your summer reading list.

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Upcoming Events

Fri., May 20	Zalman Usiskin & Andrew Chukerman	NCTM and a Century of Mathematics Education – A Review with Music (Fountain Blue)
Fri., Sept. 16	James Tanton	MMC Dinner Meeting
Sat., Sept. 17	James Tanton	MMC Saturday Workshop

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.

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