

# Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago  
Volume XLV No. 3 Nov. 2015

## Mathematics Teaching, Social Justice, & Creative Insubordination

### November Speaker Rochelle Gutierrez



**From I-90 & Southbound I-294:** Exit at I-190 West to O'Hare; Exit onto North Mannheim Rd.; Take Mannheim Rd. North 2.25 miles.

**From Northbound I-294:** Exit at West Touhy Ave.; Take Touhy Ave. to Mannheim Rd.; Turn right on Mannheim Rd.

**Public Transit:** Take the CTA Blue Line to the Rosemont Bus Terminal; Take Pace Bus #223 to Touhy Ave. & Lee Rd.; Walk East on Touhy to Mannheim Rd.

#### Friday, November 6, 2015

5:30 PM Doors Open, 6:00 PM Social Hour  
7:00 PM Dinner & Talk

#### Fountain Blue Banquets & Convention Center

2300 Mannheim Rd., Des Plaines  
(847) 298-3636  
\$43 for Members, \$49 for Nonmembers

#### Reserve by Noon, Monday Nov. 2

Online at [www.mmchicago.org](http://www.mmchicago.org)  
or by phone at (630) 907-5023

In an era of high stakes testing, new teacher evaluations, Common Core State Standards, and changes in collective bargaining agreements, teachers are being stripped of their professional judgment. Those teachers who cannot skillfully negotiate the politics of language, racism, and testing cannot adequately support their students to learn. Nowhere is this truer than in the mathematics classroom, where teaching is always a political endeavor. Rochelle Gutierrez, our November dinner meeting speaker, will highlight some of the ways that both mathematics and mathematics teaching are political. Then, she will share what she has learned from supporting mathematics teachers to use creative insubordination. Rochelle will offer teachers a set of strategies and language they can use to advocate for themselves and their students.

Rochelle Gutiérrez is Professor of Curriculum and Instruction and Latina/Latino Studies at the University of Illinois, Urbana-Champaign. She earned her Bachelor's degree in Biology from Stanford University, and her Master's degree and PhD in Mathematics Education from The University of Chicago. Her research focuses on equity in mathematics education, race/class/language issues in teaching and learning mathematics, effective teacher communities, and the achievement gap.

Rochelle has served as a member of the RAND National Mathematics Study Panel and the National Academy of Sciences' Committee on Increasing Urban High School Students' Engagement and Motivation to Learn. She received the Association of Mathematics Teacher Educators' Excellence in Research Award and a Fulbright fellowship in which she documented the different cultural practices and algorithms used in Mexican classrooms. Her work has been published in such journals as *Mathematical Thinking and Learning*, *Journal for Research in Mathematics Education*, *Harvard Educational Review*, *Democracy and Education*, *Urban Review*, and *Mathematics Teacher*. She currently serves on the Association of Mathematics Teacher Educators' Standards Writing Team that is developing national standards for mathematics teachers.

Before and throughout graduate school, Rochelle taught middle and high school mathematics in San José, California. She currently is the Principal Investigator on a large NSF grant that seeks to understand what it takes to develop high school mathematics teachers who engage their students in rigorous and creative mathematics and are committed to social justice.

Mark your calendars now for November 6! Come and learn why mathematics teaching is a political endeavor and how you can use creative insubordination to advocate for your students. This is a presentation you won't want to miss!

# Points From The Interior

BY PATRICIA TRAFTON

“Why 500 Strangers Stopped Traffic to Eat Dinner on an Ohio Freeway” was a statement that certainly caught my attention as I was skimming through my e-mail. The headline was for the front page article of the October 9 issue of *The Daily Good*, an online magazine that promotes and shares stories about creative, transformative ideas and positive works that people do all over the world for the betterment of their communities. So why would 500 strangers eat dinner on a freeway? And what does this have to do with mathematics?

As I read further, I learned that the purpose of the free community dinner, called 500 Plates, was to talk openly about the future of the city of Akron and to bring together people from all 22 neighborhoods in Akron. The setting for the dinner was specifically chosen because it was the cause of a lot of divisiveness among the citizens of Akron. (See <http://tinyurl.com/pluox6v> for The Daily Good article about this event.) The dinner project was the brainchild of Hunter Franks, an artist from San Francisco who travels the world “transforming public spaces into positive venues of conversation and connection. His public installations create shared spaces and experiences that break down social barriers and build connections between people and communities” (<http://www.hunterfranks.com/about/>). And what does this have to do with mathematics?

I checked out Hunter Franks’ website and discovered more than a dozen community-building projects that he has created and directed. One that caught my eye and my mind is the Neighborhood Postcard Project. In this project, “people from different neighborhoods in a city mail postcards about their neighborhood to someone from a different neighborhood to help break down different stereotypes about that neighborhood” (<http://www.hunterfranks.com/#/neighborhood-postcard-project/>). And then I began to wonder. Could the Neighborhood Postcard Project work for a mathematics community? Teachers could send postcards to their students about why they like math and chose to become a math teacher. Community members and other school staff could write postcards to students of a school about why mathematics is important to learn and/or how they use mathematics in their jobs. Students could send postcards to their parents or guardians or community members about what math they are learning in school and how it can be used in life outside of the classroom. After such an exchange of postcards, students and their families, community members, teachers, and school staff could sit down to a dinner in a school cafeteria or a street closed to traffic, block party style, and share stories about their favorite experience(s) in math class or favorite use of mathematics or other positive memories or experiences about math. The Mathematics Postcard Project (playing off of “Neighborhood Postcard Project”) and community dinner could be a way to generate interest in mathematics, to help students understand the importance and usefulness of mathematics, and to build community among the members of that community.

To continue the school-family-community collaboration, the school could host a Math Fair. The Math Fair could be oriented a couple of different ways. One way a Math Fair could be structured would be to invite community members, parents/guardians, and school personnel to each give a series of presentations about the mathematics they use in their jobs. Each presenter would be assigned a classroom or other appropriate space to speak in, much as is done at MMC’s Conference of Workshops every year. An alternative arrangement would be that each speaker would be given his or her own 10 ft. by 10 ft. booth, set up in the school gym, mirroring the arrangement of the exhibit hall of a state, regional, or national math conference.

The other way a Math Fair could be organized is similar to the Math Fair that MIND Research Institute and LEAP Innovations organized and hosted at Navy Pier on September 20, 2015. Designed to show that “mathematical beauty is everywhere in the world around us,” the goal of the Fair was to connect youth and adults of all ages to the deeper joys and fascinating aspects of mathematics. (*MIND Research and LEAP Innovations’ Math Fair Information and Activity Book*). If you visited the Math Fair on Sept. 20 you saw, and maybe played, a variety of games that are played in Africa and in other parts of the world. You may have seen 3-D objects that model the conic sections. You may have seen 3-D printers create geometric objects, and you may have solved logic, number sense, measurement, and weight problems after attending a Math Mystery Theater presentation. With activities geared for preschoolers to adults, there were enough to keep people of all ages engaged for several hours.

Just think--students, families, community members, and school staff coming together to talk about and do mathematics! The conversations that are started through a Mathematics Postcard Project and a community dinner could continue via a Math Fair. And through each and all of these events we would be helping build a positive attitude about mathematics in our students, their families, and the members of our communities. What a wonderful way to better our schools and the communities we work in!

# News Of Note

By JOHN McCONNELL

## NCTM Membership Affiliate Rebate Program

MMC recently received a check from the National Council of Teachers of Mathematics through the NCTM affiliate rebate program. Over the past year, 25 MMC members chose to designate MMC for the membership rebate when they renewed their NCTM memberships online. The individual rebates are modest, but they add up to a worthy contribution to MMC activities. When you renew your NCTM membership, please do it online and mark MMC for the rebate.

## Upcoming Regionals

Two NCTM Regional Conferences in the Midwest are in November. The Minneapolis Regional is November 11-13, and Nashville, November 18-20. Registration is through the NCTM website.

Fall 2016 Regional Conferences are soliciting Speakers. If you want to present in Phoenix (October 26-28), Philadelphia (October 31-November 2), or St. Louis (November 16-18) next fall, submit a proposal through the NCTM website.

## Video Series on Teaching and Learning Common Core

NCTM and The Hunt Institute have produced a series of videos to enhance understanding of the mathematics students need to succeed in college, life and careers. The series covers the CCSSM Standards for Mathematical Practice, offering ideas on developing conceptual understanding. Beginning in the primary grades, the videos show the importance of developing a solid foundation for algebra, as well as laying the groundwork for calculus and other postsecondary mathematics coursework.

## Do you use Twitter?

Use #mmcchicago to tag your tweets and communicate with other MMC members on twitter!



**"like" us on Facebook!**

<http://www.facebook.com/MMCChicago>



# October Talk Summary

BY SHEILA HARDIN

“Having fun is a key in mathematics” was a great opening to draw in the small but eager crowd to the MMC meeting on October 2nd. Edna Bazik treated the group to her presentation on “The Ten Keys to Support Mathematics Understanding”. Edna is an award winning educator, with a vast and varied experience. This experience has provided Edna with an opportunity to work on the 8 Mathematical Practices associated with the Common Core and Edna encouraged everyone to use those practices to build understanding in their classroom. While Edna mentioned the PARCC test and the CCSS, she was clear that mathematics must go beyond just assessments and it is up to everyone to consider the whole child. Edna pointed out that we all share the common goal of having mathematically proficient students. Therefore, it is up to all of us to provide opportunities that empower students with knowledge in our classrooms. The ten “keys” that Edna provided are designed to help teachers do that.

## **KEY 1 – Use math warm-ups, POD, problems of the day, do-now’s and exit slips**

These activities help make every math minute count and provide students space to persevere in solving problems. Edna pointed out the need to have students make sense of problems, not just use a formula to solve an equation. Edna gave an example, “Can you express 30 using three equal digits?”, and explained that student’s first instinct to say  $10 + 10 + 10$  shows people do not understand the vocabulary. The audience immediately began to one-up each other with different answers.

## **KEY 2 – Use correct mathematics vocabulary**

When students use correct math vocabulary, Edna stressed that students are comfortable with the meaning of words and symbols. Edna showed an example of an active Math Word Wall as a way to get students to participate and to help with student mastery.

## **KEY 3 – Use collaborative Work groups or math learning communities**

Communication is a necessity in all aspects of communication but Edna reminded everyone that in math it is important to include listening, speaking, and writing as forms of mathematical communication. Activities such as pair-share and groups working on engaging problems help facilitate the concept of having students explain their thinking in a respectful environment. Edna pointed out that students who are allowed to struggle, in a productive way, built problem solving skills.

## **KEY 4 – Ask big, critical, essential questions**

How did you solve it? Did you notice a pattern? Why did you try that? Those are all examples of the questions that Edna encouraged us to ask. Using critical questions, along with wait time, helps students explain their mathematical thinking.

## **KEY 5 – Show all of your work. Be neat. Be organized.**

Every teacher has had a student who struggles to show their work but we all know that it is an important part of their learning experience. Edna suggested having students’ journal in their spirals or notebooks as a way to get them writing about math. We want students to be able to explain their thinking both verbally and in writing but we also need to value all the ways they attempt to solve a problem. Edna reminded everyone to celebrate when a student tries a problem in a way that we were not expecting. This will help the student build pride in their work.

## **KEY 6 - Have students analyze their mistakes...homework, quizzes, and tests.**

Edna strongly encouraged everyone to have their students reflect on their mistakes. She provided an example of a correction/reflection sheet. In three, simple columns students could put the problem number, the correct solution, and what mistake was made. Brain research supports the importance of a correction and reflection sheet as a way to help students think about improving their next assessment.

**KEY 7 – Encourage use of hands-on use of math manipulatives.**

What is your favorite math manipulative? Edna discussed the benefits of everything from Figurethis.org to YouTube as a way to find possible math manipulatives to use. This doesn't discount the Algebra tiles and other hands-on manipulatives that we all enjoy using. The visual aspect of the manipulatives help students gain understanding to the problem.

**KEY 8 – Providing engaging problem solving applications and tasks.**

Engaging students in problem solving is the heart of what we want to do as math teachers. Edna reminded everyone of techniques that can help but stated that they need to be practiced regularly and explicitly. Ideas included restating the problem in your own words, explaining the meaning of a problem, making conjectures and estimates, and using concrete objects to help conceptualize the problem. These, and others, help students succeed in grappling with difficult problems.

**KEY 9 – Have students involved with creative, daily life, realistic math projects.**

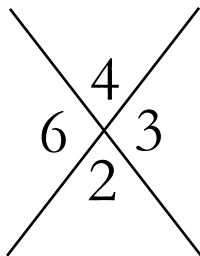
While we, as educators, are dealing with the impact and implementation of the PARCC exam, Edna reminded us that PARCC calls upon us to relate math to real life. She provided several examples of ways to do this with projects that not only align real life data but also may connect your class to a parent's job or another division in your school. Architecture, careers and physical fitness were all topics in the projects that Edna explained.

**KEY 10 – Engage students in motivational competitions and activities. Math is not a spectator sport!**

As Edna closed out her ten keys of understanding we were reminded of how much students (and their teachers in the audience) love to compete! While Edna explained the benefit of mental math activities such as "Krypto!" or "24", everyone began to challenge their table mates to come up with the answer faster or in a more creative way. Edna encouraged everyone to take one idea from the 10 Keys and try it out in the coming week. I can personally attest to using the game "24" for the last five minutes of class the following week and my students were thrilled.

**Example of 24 Card Game**

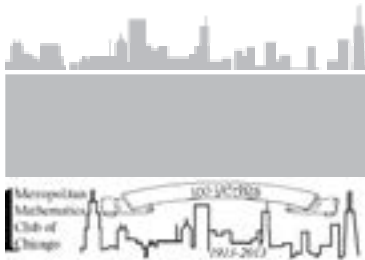
Goal: Make the number 24 from the four numbers given. You can add, subtract, multiply and divide. You must use all four numbers, but use each number only once. You do not have to use all four operations.



One Possible Solution:  $(6 \times 4) \times (3 - 2) = 24$

Can you come up with another way?

How about another?



# MMC Scholarship

By LAURA KAPLAN

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The Metropolitan Mathematics Club of Chicago is offering a \$1,500 scholarship for a high school senior who will pursue a career in the teaching of mathematics. In addition, up to two Filliman Scholarships may also be awarded for the same amount (funded by a gift from the Filliman estate). The selected students, their parents and their sponsoring teachers will be invited to the May 13<sup>th</sup> MMC dinner meeting at which time the scholarship recipients will be honored.

A selection committee of MMC members appointed by the Board will determine the scholarship awards. To be eligible, an applicant must submit the application, have an official transcript sent, and request a letter of recommendation from a member of MMC such that all of the materials are *received* by March 18, 2016. The committee will establish its own guidelines for evaluating applications, and will make a recommendation to the Board as to the awarding of the scholarship. No member of the selection committee may nominate nor recommend a candidate. A copy of the application is online and will be provided in a future issue of *Points & Angles*.

The guidelines used for selection shall be:

- A. Demonstration of overall academic scholarship with an inclusion of at least eight semesters of college preparatory mathematics. (A minimum cumulative grade point average of 3.0, where A = 4.0)
- B. A statement of the intention to pursue a career in mathematics teaching.
- C. Indication of participation in extra curricular activities, especially those that may have a positive influence on a teaching career.
- D. Applicants must have a letter of recommendation from a member of the Metropolitan Mathematics Club who is familiar with the applicant's academic performance and his or her potential as a mathematics teacher.
- E. Applicants must submit an essay (400-word maximum) explaining why they would like to be a mathematics teacher.

\*\* Up to 3 awards are possible based on candidate qualifications. The organization reserves the right to award fewer scholarships if these are not met.

## ln(blogs)

By JOHN O'MALLEY

I tend to gravitate towards blogs about high school math teachers that are engaging students in different activities, labs, or projects. It is more of my style and I look forward to finding new ideas to bring back to my classroom. With that being said, I am always looking for great ideas from lots of bloggers and Andrew Stadel hits the mark and then some. He is a middle school teacher that is constantly improving his students number sense as well as problem solving skills. He has developed a website called estimation 180 (in though it currently has over 200 challenges) to get his students thinking about measurements and making educated guesses. I have used many of these in my classroom as a great opener activity as well as to work on pattern finding and even writing equations. They are a great resource you need to see. His insights on his blog are also top notch so you now have another plethora of resources to check out. I encourage you to try one estimation challenge with your classroom and let me know how it goes!

<http://mr-stadel.blogspot.com/>

# COMING SOON: The MMC Conference of Workshops!

Save the date: Saturday, February 6, 2016

At Lincoln-Way Central High School in New Lenox.

Watch your mailbox for the conference program book,  
which should be arriving in early November.

You won't want to miss this!

NAME		PREFERRED CONTACT Check one: <input type="checkbox"/> Home <input type="checkbox"/> Work	
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# Upcoming Events

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Oct. 23-24	ICTM Conference	Tinley Park, IL
Fri., Nov 6	Rochelle Gutierrez	Mathematics Teaching, Social Justice, & Creative Insubordination
Fri., Dec 11	Dale Seymour	Thanks For The Memories: What I've Learned From 60+ Years Of Teaching, Writing, & Publishing About Mathematics
Fri., Jan 8	Steve Viktora	Two Chariots Leave Different Cities At The Same Time... A Lively Look At Word Problems Through The Ages
Sat., Feb 6	MMC Conference Of Workshops	Lincoln-Way Central High School
Fri., Mar 11	Francis "Skip" Fennell	Critical Foundations For Establishing Number Sense
Fri., May 13	Zal Usiskin	The Real Big Ten: The Toughest Mathematical Ideas For High School Students To Learn, And How To Approach Them

Send upcoming event items to [jomalley@glenbrook225.org](mailto:jomalley@glenbrook225.org) 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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