

Points & Angles

Newsletter of the Metropolitan Mathematics Club of Chicago
Volume XLIV No. 8, May 2010

The Geometry of Shape and the Shape of Geometry

Zalman Usiskin
University of Chicago

By DON PORZIO

The 2009-10 MMC program ends with its traditional biannual talk by the one and only Dr. Zalman Usiskin. In his talk (which is, of course, subject to change and probably will between this writing and May 7), Zal will look at how the content of the geometry curriculum has been influenced by axiomatics, transformations, coordinates, applications, and technology over the years, and how each of these influences colors the way one thinks about geometry as a subject to be taught and learned. In particular, these influences affect the idea of “shape,” and so the “shape of geometry” is related to the “geometry of shape.”

Zal first spoke at a MMC meeting (then the Men’s Mathematics Club of Chicago and Vicinity) in May 1969. Since 1982, Zal has been invited to speak at the May MMC meeting of each even-numbered year. This meeting marks his 22nd invitation to speak and the 23rd time he has spoken (once giving a spur-of-the-moment talk when the speaker did not show). Zal was a member of the MMC Board of Directors from 1970 to 1973 and in 1984 received the first MMC Distinguished Life Member Award ever given. In 1994, Zal received the Glenn Gilbert National Leadership Award from the National Council of Supervisors of Mathematics. From 1995 to 1998, he was on the board of directors of the National Council of Teachers of Mathematics, and in 2001, he received a Lifetime Achievement Award from NCTM.

Special thanks go out this month to our area Texas Instruments representative, Ron Thomas, as well as Vince O’Connell, Director of TI’s Educational Product Coaches, Field Marketing, Education Technology Group, for paying for the dinners of the MMC scholarship winners and their parents, as well as supplying calculators as prizes. Thanks as well to Fountain Blue for serving appetizers.



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, May 7, 2010

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

Fountain Blue Banquets & Convention Center

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

\$34 for Members, \$39 for Nonmembers

Reserve by Noon, Monday, May 3

reservations@mmcchicago.org or (630)
907-5023, day or night, leave a voicemail.

Points from the Interior

By PAUL CHRISTMAS

The MMC year has flown by. I now happily write my last *Points from the Interior*. It is my hope you enjoyed the program half as much as I did when putting the program together. When planning the program this year, most of the speakers were selected from a list of speakers whom I always try to hear at conferences no matter what the title or the brief description in the program booklet. I know I will hear something that will make me a better teacher or will make me think about mathematics education in a new and different way. I

I am one of the lucky presidents who has Zal Usiskin as the final speaker of the year.

am one of the lucky presidents who has Zal Usiskin as the final speaker of the year. (Zal happens to be on the list mentioned above.) Don is finalizing an outstanding program for next year. As soon as the dates are released mark them on your calendar as priority events.

We owe a debt of gratitude to the following six MMC members who are retiring this year.

- John Benson (past president)
- Carol Nenne (board member and conference co-chair)
- John Diehl (past president)
- Virginia Highstone (past board member and past conference co-chair)
- Suzanne Rzepka (past president)
- Sam Urbain (past president)

These teachers are known state wide and nationally. The contributions made by the group to mathematics education locally and nationally are far too many to list. They have spoken at NCTM Annual Meetings, ICTM Annual Meetings, MMC regular meetings, and have presented at the MMC Conference of Workshops. Please make a special effort to thank them for helping to make MMC the best professional organization in the country.

It has been an honor to serve MMC this year! Have a successful ending to this school year and a relaxing summer!



Points & Angles, Volume XLIV
Number 8, May 2010



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The Most Important Misunderstood Concept in Geometry

BY DAN HALL

The March meeting featured one of our own, Ken Indeck, and a beautiful talk on the current state of mathematics education. The talk was constructed in much the same way that a student's understanding of mathematics is constructed. Ken began by looking locally at the concept of scaling in geometry. Then he generalized the lesson on scaling into a description of how we can present such topics. Finally, Ken discussed how we should consider our curriculum, in order to better the education we provide for our students. His steps showed us how, on every level of our teaching, we could find better ways to inspire students and encourage their passion for mathematics.

Ken began his lesson on scaling by explaining how he introduces the ideas of dimension, in a way in which he (and most everyone) particularly appreciates, with chocolate. He showed us definitions: length, as in the artist's name etched on a chocolate bar; area, as in covered in chocolate; and volume, as in *filled* with chocolate! He then introduced us to his handmade drawing of dried linguine—an example of a nice rectangular prism. He asked us to think of a piece of linguine twice as large in every way, sharing the wonderful imagery of how he has his students appreciate this: by drawing the original length and then stopping once along each direction to emphasize the effect of doubling. Ken then explained that he would ask students to relate to the original piece—2 times (length), 4 times (surface area), and 8 times (volume). The ability to break the

piece would be four times as difficult because this would be connected to cross sectional area. The amount of linguine would be eight times as much because this would be connected to volume.

Ken continued by talking about trees. He asked us what would be the effect of scaling on a tree made 10 times as tall. Would the tree's weight be a factor of length, area, or volume? By what factor would the tree's strength change? Even though the tree would increase in height by 10 times as much, the tree's mass would be increased by 1000 times, while its strength only by 100 times. This was, according to him, the reason why we don't see trees that are 300 feet tall. Ken then shared with us how this statement always generates a comment from some student, "Well, Mr. Indeck, then how do you explain redwoods?" I saw this as a beautiful setup to encourage and acknowledge students to think about the material being presented. He shared how the shape of a redwood tree is different, thus allowing it to support the dramatic increase in mass. Ken introduced several more examples to round out his lecture. He shared with us why, due to volume, a cat needs thicker legs than an ant; why, due to area, a human needs a coiled digestive track when a worm does not; why "honest" pricing of drink sizes would feel strange to us; and why an elephant's wrinkled skin helps keep it cool while a polar bear's mass helps keep it warm.

Ken next shifted the direction of his talk into what he called his "rant" component. He began

by lamenting the loss of the lecture in the classroom. At first, I was quite confused, as I was under the impression that "lecture = bad teaching." Ken explained that to him lecture was not synonymous with standing at the board and telling students how to solve problems. Rather, it was engaging the class in significant discourse about mathematical ideas. He explained that telling was not teaching, and that a teacher's primary task was to inspire students in the classroom. Ken demonstrated, through the example of his lecture on scaling, how students can be meaningfully engaged in a true lecture. He shared his view that the attrition of new teachers is not due to paperwork and other commonly cited frustrations, but instead that teachers don't get to do what they want to do in the classroom. Too often, new teachers get caught in the cycle of needing to teach certain material because it is covered on the final exam. This requires that the teachers need to give certain tests and must teach the same thing as everyone else does, on the same day, ultimately resulting in

a loss of diversity in our classrooms. Ken explained that diversity within a particular course is critical to making that course meaningful for all students. Just as, when we go to different restaurants and order spaghetti and meatballs, we don't ex-

Ken began by explaining the ideas of dimension with chocolate: length, as in the artist's name etched on a chocolate bar; area, as in covered in chocolate; and volume, as in *filled* with chocolate!

See March Talk Summary, page 4

March Talk Summary, continued from page 3

pect the exact same dish—the sauce seasonings, meat mixture, and pasta size vary—we shouldn't expect the exact same geometry course from different teachers. Diversity of curriculum should be valued by administrations, as it ultimately fulfills the greatest need in a classroom, passion.

Have you inspired your kids today?
Have you been yourself today?

The final component to Ken's talk was his idea of the "75% approach." This plan was for teachers to agree upon 75% of the material for a course and leave 25% for teachers' individual interests. This quarter of the curriculum provides an outlet for teachers to instill their passion for teaching and the material into the course. Ken explained that, by giving teachers flexibility in the way that they inspire students, we create a way in which teachers can inject material that they perceive to be valuable that might otherwise not be covered. To different teachers, this material would take different forms, but Ken encouraged us to follow our "gut" and recognize that if we thought it was valuable, then it probably is. He closed his talk by posing to us two questions: "Have you inspired your kids today?" and "Have you been yourself today?"



Upcoming Event Details

T³ Summer Workshops: Aurora, IL, June 8–10; Deerfield, IL, June 15–17.

Three-day workshops: "Getting Started with TI-Nspire" and "Using TI-Nspire in Your Classroom."

http://education.ti.com/educationportal/sites/US/nonProductSingle/summer_workshops.html



USACAS6, New Trier High School, Northfield Campus, Northfield, IL, June 26–27. Sixth U.S. conference on CAS. Early registration for \$195 ends May 7; after May 7, registration is \$250.

<http://usacas.org/6>

MMC Summer Workshops, Glenbrook South High School, Glenview, IL, August 2–4. What are the most important concepts in the courses you teach? What are some effective ways for students to learn these concepts? Spend some time this summer exploring answers to these questions. This is a rich opportunity for newer educators to learn how to tackle teaching Algebra, Geometry, or Algebra II. From activities to theory, from hands-on to technology, from content to curriculum, learn from some of Chicago's best teachers.

<http://mmcchicago.org/>

Board Report—Meeting of 10 February 2010

By STEVE VIKTORA

The Board of Directors met on 10 February 2010.

Sheila Hardin reported that the club seems to be in reasonable financial health at present.

Mary Wiltjer reported a membership of 457, of whom 10 were first year members, 50 were retired members, and 33 were student members. She reported that not only were the student and first year members electronic members, but about 27 others were voluntary electronic members.

Carol Nenne, on behalf of a committee whose other members are Phil Gartner and Isaac Greenspan, led a long conversation on proposed changes to the Bylaws. These changes were to be printed in *Points & Angles* prior to a vote by the membership.

The Board decided to pursue the possibility of increasing the number of professional learning opportunities this summer. The proposal was to hold three-day workshops during the summer. The three sessions would be Teaching Algebra 1, Teaching Geometry, and Teaching Algebra 2. Carol Nenne and Mary Wiltjer agreed to co-chair this effort.

The next meeting of the Board is scheduled for 23 May 2010 at 3:00 PM at a private home. Members of the club are welcome to attend any Board meeting, but please contact Paul Christmas at ptc3144@aol.com before 16 May if you plan to attend. Because this is a dinner meeting, you would be expected to pay for your meal.

Changes to the Bylaws

The MMC membership voted 77-1 to approve the changes to the bylaws. These changes allow MMC to be more in line with typical not-for-profit organizational bylaws, give further definition to responsibilities of board members, and specify additional required financial oversight.

NAME		PREFERRED CONTACT Check one: <input type="checkbox"/> Home <input type="checkbox"/> Work	
HOME ADDRESS			
CITY	STATE	ZIP	
HOME PHONE	HOME E-MAIL		
EMPLOYER			
WORK ADDRESS			
CITY	STATE	ZIP	
WORK PHONE	WORK E-MAIL		
ELECTRONIC-ONLY MEMBERSHIP Check the box below for electronic-only membership. You will receive an email with a direct link to each issue of <i>Points & Angles</i> when it is posted on the web site, often before paper copies are mailed. You will no longer receive <i>Points & Angles</i> by mail.		MEMBERSHIP TYPE Check one:	
<input type="checkbox"/> Electronic-Only Membership		<input type="checkbox"/> 1 year (\$27) <input type="checkbox"/> student, 1 yr (\$15) <input type="checkbox"/> 2 years (\$50) <input type="checkbox"/> 1 st yr teacher, 1 yr (\$15) <input type="checkbox"/> 3 years (\$70) <input type="checkbox"/> retired, 1 yr (\$20)	
FORM USE Check one:		MEMBERSHIP COST \$	
<input type="checkbox"/> New Membership <input type="checkbox"/> Renewal <input type="checkbox"/> Former Member <input type="checkbox"/> Change of Address		DONATIONS	
		SCHOLARSHIP FUND \$	
		SPEAKER FUND \$	
		TOTAL AMOUNT OF CHECK \$	

Make check payable to **MMC**

MMC Membership and Change of Address Form

Mail completed form and check to:

MMC
 329 Michael Manor
 Glenview, IL 60025



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Inserts

- MMC Summer Workshops
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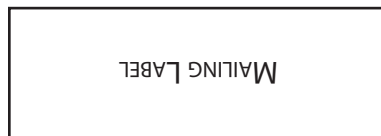
Upcoming Events

Fri., May 7	Zal Usiskin	The Geometry of Shape and the Shape of Geometry
<i>Jun. 8–10</i>	<i>Aurora, IL</i>	<i>T³ Summer Workshops</i>
<i>Jun. 15–17</i>	<i>Deerfield, IL</i>	<i>T³ Summer Workshops</i>
<i>Jun. 26–27</i>	<i>Northfield, IL</i>	<i>USACAS6</i>
Aug. 2–4	Glenbrook South H.S.	MMC Summer Workshops
<i>Oct. 15–16</i>	<i>Springfield, IL</i>	<i>ICTM Annual Meeting</i>
Sat., Feb 5	Adlai Stevenson H.S.	MMC Conference of Workshops

(See also “Upcoming Event Details” on page 4)

Send upcoming event items to ilg@chicagomath.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.



METROPOLITAN MATHEMATICS CLUB OF CHICAGO
 c/o MMC
 329 Michael Manor
 Glenview, IL 60025

Metropolitan Mathematics Club of Chicago Summer Workshops

August 2nd to August 4th

What are the most important concepts in the courses you teach? What are some effective ways for students to learn these concepts? Spend some time this summer exploring answers to these questions.

MMC is expanding its professional development opportunities to summertime with inexpensive workshops getting at the heart of school mathematics. The workshops will be 3 days long and be run by master teachers. This is a rich opportunity for newer educators to learn how to tackle teaching Algebra, Geometry, and Algebra II.

Workshops will explore approaches and practices in the teaching of each course. From activities to theory, from hands-on to technology, from content to curriculum, learn from some of Chicago's best teachers. You'll leave with classroom-ready activities.

Workshops will be limited to just 22 participants, allowing for extensive involvement and collaboration. Many technologies will be available, including Geometer's Sketchpad, CAS, graphing calculators, and more.

TEACHING ALGEBRA with Peter DeCraene JoEllen Flener Carol Nenne	TEACHING GEOMETRY with John Benson Ken Indeck Ray Klein	TEACHING ALGEBRA II with PJ Karafiol Rich Rukin Mary Wiltjer
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This is an opportunity not to be missed, especially for newer teachers.

When: Monday, August 2nd through Wednesday, August 4th, 8:30 am – 3:30 pm

Where: Glenbrook South High School in Glenview, IL

Cost: \$100 (can you believe it?)

CPDUs: 18 – evidence of completion forms will be provided

To register for the workshops, complete the registration form on the other side and mail with a check made out to MMC for \$100 to the address given.

**Registration is on a first come –first serve basis, so don't delay.
Please share this form with others.**





MMC SUMMER WORKSHOPS 2010

August 2 through August 4 at Glenbrook South High School in Glenview, IL

Complete the form below. Send form and check (made out to MMC) to address at the bottom of the page.

CIRCLE THE WORKSHOP FOR WHICH YOU ARE REGISTERING:

TEACHING ALGEBRA

TEACHING GEOMETRY

TEACHING ALGEBRA II

Name _____

Home address _____

City _____ State _____ Zip _____

Phone number _____

Cell phone number _____

School _____

Email (required) _____

Purchase orders cannot be accepted.

Send check made out to MMC for \$100 to:

MMC
329 Michael Manor
Glenview, IL 60025

Any questions? Email Mary at mwiltjer@glenbrook.k12.il.us .

**Since 2010 was such a huge success,
The MMC Conference of Workshops
is back in 2011.**

**To repeat the excellence,
WE NEED YOU TO PRESENT!!**

**The conference will be on Saturday, February 5th
at Adlai Stevenson High School
in Lincolnshire, Illinois**

- Workshop format: 75-minute sessions where participants are actively involved.
- Looking for speakers from all grades K – 16.
- New speakers are welcome.
- Co-presentations are encouraged.
- Various topics needed.
- Xerox this and give it to other potential speakers.
- We'll have coffee, carbohydrates, and chalk.
What else could a workshop need? **You!!**
- Have questions? Contact Mary or Carol at mmcconference@mmcchicago.org
- Fill out the speaker form online at mmcchicago.org or on the other side of this page & return it by September 18th.

**Speaker's Information Form for the
MMC Conference of Workshops 2011
Adlai Stevenson High School
Saturday, February 5, 2011**

***Please give information for ALL speakers. Addresses and emails are very important for all speakers.
If needed, fill out a second form for additional co-speakers.**

Lead Speaker:

Name: _____ School: _____

School phone: _____ and Home phone: _____

e-mail: _____

Co-Speaker:

Name: _____ School: _____

e-mail: _____

Preferred Mailing Address: _____

WORKSHOP INFORMATION

Title: _____

Brief Description for Program Book:

Approximate Grade Band(s):

**(Participants will use this information to determine their sessions. Grades: _____ through _____
Please select/mark the grade levels for which your session is appropriate.)**

EQUIPMENT NEEDS: Every room will have a chalkboard or whiteboard. Please indicate any additional needs below, *including overhead projectors*, being very specific. If you are planning to use a computer projection device and are able to bring your own, we would appreciate it! Workshops have a maximum capacity of 28 participants.

Calculator sets (30 calculators and viewscreen):

TI-84 TI-89 TI-Nspire TI-Nspire CAS Other(specify) _____

Overhead projector Computer Lab I will bring my own computer and projector Single Computer and projector Computer projector only (I will bring my own computer) Internet access

Other equipment needs (be specific): _____

Are you willing to repeat your session? Yes No

Are you planning to stay for lunch (on MMC of course!) Yes No

Please email to: mmconference@mmcchicago.org or mail to: MMC
(note: form may be found on website www.mmcchicago.org) 3817 S. Lombard
Please complete, save and email) Cicero, IL 60804-4132

Please return by September 18th.