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Kansas City Area Teachers of Mathematics

The Summation

Volume 16, Issue 2

Summer/Fall 2016

Special points of interest:

- Fall Conference
- News
- Resources
- Networking

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KCATM Board Contact Information

2016 MATH CONFERENCE

November 5, 2016 (Click here to register)

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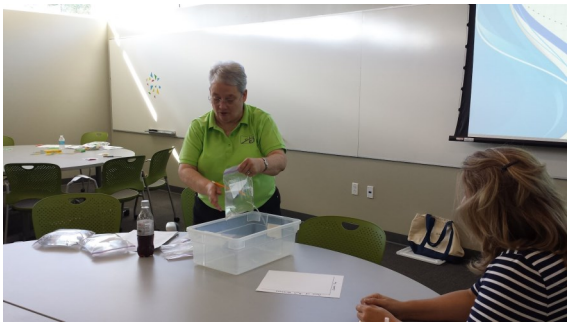

Above: Dr. Rita Barger showing KCATM members how to use water in a Ziploc bag for Algebra and graphing.

KCATM SPEAKER PROPOSAL

ANNUAL CONFERENCE

Saturday, November 5, 2016

UMKC: Education Building – 1st Floor

On-site registration begins at 8:00 am

Sessions will be 30 or 60 minutes in length.

Questions: Call or email Dr. Rita Barger:

816-235-5655, bargerr@umkc.edu

Please print. Return your proposal to:

Dr. Rita Barger

UMKC, Education 309

615 E. 52nd St.

Kansas City, MO 64110

or email attachment: bargerr@umkc.edu

or fax: 816-235-6923

Name First:_____ Last: _____

Address:_____

_____

Phone: Work:_____ Home: _____ Cell:_____

Email: _____

School/Company: _____

Grade Level Range - Select all that apply

_____ Primary (PK-3) _____Intermediate (3-5) _____Middle (6-8) _____ High (9-12) _____ General

Session Length: _____ 30 Minute Burst _____ 60 Minute Regular

Title:

Description: (Write a concise, specific description of the essential content of your presentation.) Please limit it to **no more than 50 words**. On receipt of your proposal, the description you provide here will be printed in the program.

A/V Equipment: Internet Access, one LCD projector and one screen will be provided in each meeting room. Check one of the following choices:

_____ No additional equipment required

_____ Additional audiovisual or technology equipment necessary for the success of this presentation. Provide this information on the back of this sheet.

_____**Additional Requests:**

Editor's Corner— Jan LaFevers

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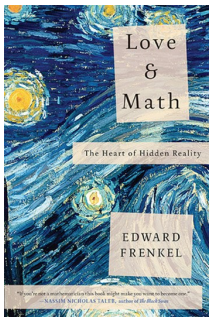
~A *New York Times* Science Best-seller



Love and Math is an intriguing tale of Edward Frenkel's journey of becoming a world renowned mathematician. He does go into great mathematical detail of many of his studies, which will only interest those of you that truly love mathematics. Some may even be beyond your understanding initially, but I encourage you to either skim over it to get the jest of his story, or take the time to consider what he is sharing. It is through the method of what and how he is sharing his mathematical knowledge that the reader gains the insight of how passionate anyone can be about mathematics.

Frenkel's story is a great example of how the love of mathematics is very much like any other love. He makes connections with other realities of life to mathematical formulas and expands on other wonderments of the world around us such as dimensions and quantum theory. He effortlessly intertwines his analysis of geometry , number theory and algebra in relation to the representations of dimensions. My favorite parts were where he describes how mathematics can explain different art forms and our experience as we either view of create that art.

Rita Barger- Brain Teaser

Last issue's brain teaser asked you to find a way to arrange the 10 digits, 0, 1, 2, …, 9 in a triangular arrangement such that the sum of any two side-by-side numbers, modulo 10, equaled the number below and between the numbers. A correct answer was submitted by Rui Guo. If there were others, please let me know and I'll acknowledge you in the next issue. Here are two correct answers:

```
7 2 3 8
 9 5 1
  4 6
   0
```

```
1 6 9 4
 7 5 3
  2 8
   0
```

For this month, we're going to be a little whimsical. (I owe recognition to *Larry Campbell* as the source of this one.) If you omit the digit common to both numerator and denominator of 26/65, you don't change its value. (26/65 = 2/5). How many other fractions can you find that have this property? I would hope we can find some that involve 3-digit values as well.

Have fun. As always, please send your answers to me at bargerr@umkc.edu. I would like to list names of those who solve the teaser in the next newsletter.

-Sarah Hicks-Education News

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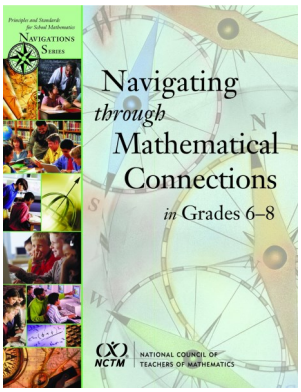

In April of 2016, the state of Missouri approved the new "Missouri Learning Standards." In these 6-12 grade mathematics standards, teachers and educational leaders find recommendations and expectations for learning related to data and statistical analysis, which may seem "new" to many middle school and high school educators, especially those teaching algebra courses. Nevertheless, middle school and high school teachers should now be considering the ways in which we can teach students to make sense of data and statistical analysis. To shed light on and invite others into conversation on this topic, I highlight a few standards and propose a worthwhile set of tasks that I used with beginning high school students during a summer math camp before the students began an Algebra 2 course at their local high school.

Recently approved Missouri Learning Standards for Mathematics (MO-LSM) suggest that in 7th grade, students should be learning to use random sampling to draw inferences about a population (MO-LSM, DSP, A1, 2016). More specifically, seventh-grade students should:

- Understand that statistics can be used to gain information about a population by examining a sample of the population.
- Understand that random sampling is used to produce representative samples and support valid inferences.

In Algebra 2, students should make inferences and justify conclusions (MO-LSM, DS, A5, 2016). More specifically, Algebra 2 students should:

- Describe and explain how the relative sizes of a sample and the populations affect the margin of error of predictions.

Lessons titled "Fishing for Data" and "Reeling in an Estimate" (NCTM, 2008, p.145-149) guide students through an investigation of population sampling using the capture-recapture method of sampling. First, students work in groups to estimate a "pond full of" fish (I used dried beans in a bowl); then they capture a subset of the fish, mark them, and then release them back into the pond. Next, they recapture a group of fish that is not identical to the original capture. Collecting data, students document the total number of fish in the sample as well as the number of marked fish in the sample. They collect and organize data with ten samples. Before estimating the actual population with an inference using the Lincoln index, students consider why or why not it is reasonable to assume that the ratio of the originally marked population: actual total population is equal to the number of marked fish in the captured population: total number of fish in the capture. Students also use the Chapman population estimate, which adjusts the error. Finally, students count the actual fish that they started with in the pong (i.e. bowl) and calculate the percentage difference between each estimate and the actual population. (Continued on page 5)

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(Continued from page 4) Students begin to understand how samples of populations are used to estimate population sizes. With this capture-recapture methods, connections can also be made to career work; for instance, the type of work might be done by a conservationist who studies the salmon population in a particular region or by a biologist who tries to help track and determine the population of bobcats in the Hollywood, California region. As an extension in Algebra 2, different groups of students could capture different sized samples to see if and/or how the margin of error of predictions changes with different sizes of samples.

I was delighted by the student energy, focus, and motivation in the room for data collection and analysis with statistics with these mathematical tasks. With hands-on experiences and structure, students wrestled with sampling, inferences, and the justification of conclusions. While this might not be a "traditional" topic of study in the 7th grade and/or Algebra 2 curriculum, I believe it is worthwhile to find ways to make time and space for these learning experiences in our classrooms. We live in an informational age where many of us value data-driven recommendations and conclusions. Data and statistical analysis are an area of mathematics that we can involve our students in as preparation for their future involvement as active, thoughtful, and critically thinking citizens.

Reference:

Pugalee, D.K., Arbaugh, F., Bay-Williams, J.M., Farrell, A., Matthews, S. & Royster, D. (2008). *Navigating through mathematical connections in Grades 6-8.* NCTM.

More Pre-Conference Speed Dating Fun

Above: JoAnn Hiatt explaining a card game for fractions in the classroom.

Above and below: Sarah Hicks playing Math Roller Derby with board members Randy Peterson and Monica McWhorter

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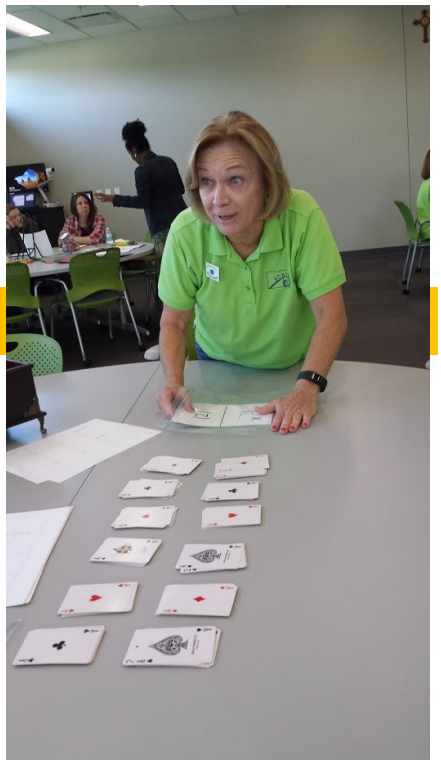
KCATM Pre Conference Speed Dating–

Have you ever wondered how to get started with presenting at conferences? If so, then it is one of many reasons you should contact a member from KCATM. September 10th we hosted a pre-conference event at Rockhurst University, that was just a sampling of what we have to offer. Our goal is to be available for our "shining star" teachers in the Kansas City Area and introduce them to our organization! At the speed dating event new members moved from table to table, getting acquainted with different math activities and members of our organization. We loved sharing our passion for having fun with mathematics while getting to know some of our new members.

Above: Vickie Byrd showing new teachers how to set up math activities and folders. Below: JoAnn Hiatt showing her enthusiasm for her card game.



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