

KATM BULLETIN

Kansas Association of Teachers of Mathematics

What is New with KATM?

- ∞ Have you been to the **KATM website** recently? Register today to access the following resources! All you need is your KATM member number and contact information.
- ∞ Do you know what zone you live in? Visit the **Kansas Zone Map**. For there, you can contact your zone coordinator or access your zone's website.
- ∞ Are you informed about upcoming mathematics conferences? katm.org has a link for the **2008 SMARTT Conference** November 6-8.
- ∞ Did you know you can complete a **survey** regarding KATM's effectiveness? We board members want to know what today's Kansas math teachers need.
- ∞ Do you enjoy professional reading? Join our **Book Study** and talk to other math teachers about the issues you face.
- ∞ Did you know you can renew your membership on-line? You can even use **PayPal** instead of mailing your check.

The KATM Board recognizes the need for change. This summer our Board Members brainstormed ideas for revitalizing KATM. We will focus on two major areas: **Communication** and **Professional Development**. Watch your email for more information!

Consider joining us November 6-8, at the SMARTT Conference. Enjoy sessions related to science, mathematics, assessment, research, and technology. Hope to see you in Overland Park!

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Christine Staab
Louisburg High
School

“It's not that I'm so smart, it's just that I stay with problems longer.”

-Albert Einstein

President's Letter

Brought to you by Christine Staab

As the new President of KATM, I want to take this opportunity to welcome you back to school! I know your enthusiasm for teaching is at an all-time high. KATM hopes to foster that enthusiasm all year long with some new initiatives. We hope that frequent communication and professional development will give you the support you need to have a successful year!

There are four ways KATM serves the Kansas Mathematics teacher: email blasts, KATM website, KATM Bulletin, and KATM-sponsored conferences. Take the time to explore these opportunities today! Let us know how we can better serve your needs. Feel free to email me, president@katm.org, anytime.

We have a great conference in store for you this year. The SMARTT Conference will be in Overland Park on November 6-8. Sessions for the Texas Instruments T³ conference are available as a conference within a conference. Mix and match your sessions to attend both SMARTT and T³. Make plans to join us. Registration is only \$95.00 for an individual!

The KATM Board will be offering a general meeting for all current and prospective members. We will be awarding two scholarships, as well as voting on our new mission statement and goals. Attend the session to meet the board members and learn about our new initiatives.

I also want to formally thank Debbie Thompson, our former President. Debbie was and is an instrumental part of our organization. She will continue her work on the board as community relations and NCTM representative.

Scholarship Information

Check out the website www.katm.org for scholarship opportunities available for teachers to go to workshops, conferences, take classes, obtain college credit, etc. Money is available!!! Take advantage of these opportunities.

Mathematics for the Elementary Teacher

Brought to you by Angie Kisner

This is my 20th year teaching. I am presently teaching full day kindergarten at Copeland Elementary. I have a wonderful family. My husband, Vern, is a physical education teacher and he is a basketball referee. I have two children. My oldest is Shaelyn, a junior. My son, Evan is a freshman this year.

I started my teaching career in Pritchett, Colorado. We went to school 4 days a week. I taught there for 4 years before moving back to Kansas. My last year in Pritchett, I team taught grades K-2. We had 19 students. It was a wonderful experience. Upon moving to Kansas, I was a stay at home mom for a year. I then was able to teach ½ day in the Title I program. The following year I became the kindergarten teacher and Title I teacher. Our program was only ½ day, which was a switch coming from Colorado with a full day program. I taught Kindergarten in the morning and Title I in the afternoon. I wanted to get a preschool program going with my daughter being the age to start preschool. I was able to get a preschool program started here. I was going to add that to my job description. So off to college I went to get my early childhood endorsement. I was teaching Kindergarten in the morning, preschool two days and Title I the other three. Needless to say, it was a challenge. Then six years ago, we started the 4 year old at-risk preschool. So my job changed once more, I was the Kindergarten and preschool teacher. During this time, I headed back to college to become ESOL certified. Our school population was changing with the influx of the German Mennonite population and I wanted to learn more to help those kids. However, I haven't learned much German along the way.

I get many teaching ideas from the Mailbox magazine. Plus I love to steal great ideas from other teachers. I also use google when I'm looking for specific topics for my classroom.

I am currently the NCA chairperson for our district and have worked with aligning curriculum to the state standards. Our school is starting a new 5 year cycle this year. I have a bachelor's degree in Elementary Education with endorsements in ESOL and Early Childhood from Fort Hays State University.

In my free time I enjoy going to my kids' events, playing volleyball and softball, gardening and reading. I am also active in our local 4-H club. I am the photography leader for our club. And we can't forget, I'm the taxi driver for my kids.



Angie Kisner teacher kindergarten at Copeland Elementary.

If you would Angie to address a specific topic in "Mathematics for the Elementary Teacher", please contact her at arkclothes@yahoo.com

Mathematics for the College Teacher

Brought to you by David Allen

Musings from the office: David S. Allen, Vice President for College Programs

As the fall semester begins there is much scrambling by those in the education business; students are scrambling to find classrooms, teachers are scrambling to find dry erase markers, and administrators are scrambling to find money to pay for the markers. As we reflect upon the season I think it is important to identify a few things to remember during this busy time.

Students are anxious about a number of issues. However, there is no more significant issue of anxiety than that faced by the pre-service elementary teacher as they enter into the math or science methods class. A large body of research suggests elementary pre-service teachers are among the most math anxious groups found in college (Harper and Daane, 1998). This anxiety is often manifested in math avoidance behaviors such as a reluctance to enter required math courses until late in their collegiate career, selection of an area of study based upon the fewest number of math requirements, and plans to pursue teaching appointments that do not include teaching mathematics (Kelly & Tomhave, 1985). I believe it is the responsibility of teachers of math methods courses, and those math instructors who deal with pre-service teachers to identify these individuals and take steps to decrease the level of math anxiety in students thereby decreasing the math avoidance tendencies. Why is this issue so critical?

Suppose that an elementary pre-service teacher actually succeeds in completing the program of study without confronting, or in some way dealing with, math anxiety. This early career teacher then is thrust into an environment in which he/she must face a sharp learning curve. Let's face it, we may be good at what we do, but the best education, in education, is on-the-job training. Early career teachers face numerous obstacles including lesson planning, establishing classroom procedures, behavior management issues, state standards which of course imply state assessment issues, and new content. For the elementary teacher this means grade level content for math, science, language, reading, and any other subject they may teach but which is not considered a core content area. This content exploration is followed by a trip down that treacherous path of identifying assessed indicators, sorting through a scope and sequence that was not designed with the state assessment in mind, and did I mention dealing with behavior management issues? I think all of us can remember these glorious days as we reflect upon our own early teaching experiences.

Needless to say these identified factors confound the experiences of early career teachers who have not dealt with their own issues regarding mathematics anxiety. In my own research (Allen, 2000), I have found a strong correlation between content knowledge and the development of math anxiety. Examination of this correlation implies elementary pre-service teachers are not learning the mathematics necessary to feel comfortable teaching at an elementary level. This discomfort manifested as "teacher math avoidance", this means that teachers who are uncomfortable with a content area often give cursory attention to that area by spending very little time teaching students that specific mathematical content (on a side note, any reader who believes teaching elementary

mathematics requires only a cursory understanding of mathematics should read the following article http://www.maa.org/devlin/devlin_06_08.html).

The point I want to make is this, helplessness, insecurity, and inferiority are common manifestations of math anxiety in elementary school pre-service teachers (Dodd, 1992; Tobias, 1988). Is this the product we want to present from our institutions of higher learning? Shouldn't we be a bit more concerned about the future teachers we are preparing in our courses? Ponder this thought, teachers who are insecure in their own abilities to teach mathematics are teaching children who will grow up to be TEACHERS.....are you prepared to break the cycle?

Until our next visit.....

- Dodd, A. W. (1992). Insights from a math phobic. *Mathematics Teacher*, 85, 296-298.
- Harper, N., & Daane, C. (1998) Causes and reduction of math anxiety in preservice elementary teachers. *Action in Teacher Education*, 19(4), 29-38.
- Kelley, W. P., & Tomhave, W.K. (1985). A study of math anxiety/avoidance in preservice elementary teachers. *Arithmetic Teacher*, 32(5), 51-53.
- Tobias, S. (1988). Dealing with math/science blocks. *Liberal Education*, 74(2), 20-23.

Mathematics for the High School Teacher

Brought to you by Debbie Sylvester

Always wanted to learn how to use a dynamic mathematics software, but not had time? Ever wanted to take your students to the lab but not been able to do it because of lack of time, availability, or facility with the software?

Have you seen GeoGebra? It is a free dynamic mathematics program that is available for download from www.geogebra.org.

Don't know how to use the software? Check out the *Introduction to GeoGebra*. This book is available online. It takes you from installation through making your own dynamic worksheet (sketch) for your students that can be uploaded and shared with others.

Don't have enough time to create your own dynamic worksheet? Check out the *GeoGebraWiki*. It is full of activities that you can use for demonstrations or for student interaction. Just click on the language you intend to use to see the list.

Think dynamic mathematics software is just for Geometry? Wrong! Dynamic worksheets are available for algebra, precalculus and calculus too!

Want to see more? At the SMARTT conference this November, check out the presentation entitled *Dynamic Modeling Software: Not Just for Geometry*.

U.S. Dept. of Energy's Real World Design Challenge

Brought to you by Sid Cooley

On August 21, 2008, at Seaman High School, Governor Kathleen Sebelius announced Kansas' Partnership in the U.S. Department of Energy's Real World Design Challenge. The Energy's Real World Design Challenge is a nation-wide contest that puts Kansas high school students along side industry experts to solve real engineering problems.

Participating schools will receive significant resources and support including:

- Training in the use of Pro/Engineer, a 3D computer aided design CAD software; Windchill Project-Link, a global collaboration software; Engineering Fluid Dynamics software; and in the application of these tools to the classroom

- Software licenses valued at \$944,100 per teacher/school or additional licenses for each additional teacher.

- \$200-\$300 in training costs per participating teacher.

- Science and engineering mentors from the DOE Energy Laboratories, FAA, associated universities, and participating business and industry partners.

- The opportunity to have student teams participate in solving real-world problems in collaboration with knowledgeable professionals, and possibly win state or national recognition for their efforts.

All districts and all STEM teachers (science, technology, engineering, math) are eligible to participate. Schools may form multiple teams with individual or groups of teachers. The goals of this nation-wide challenge are to inspire and engage all students in STEM education and to highlight career opportunities in science and engineering fields. Those goals are in perfect alignment with Kansas educational objectives.

U.S. Department of Energy's challenge will give Kansas high schoolers the opportunity to use CAD software to design 'greener' aircraft, looking for ways to increase aircraft performance and reduce operating costs. Students working on the project will also be able to collaborate on-line with mentors from the aviation/aerospace industry, the Department of Energy laboratories across the nation, as well as scientists from the Oakridge National Laboratory in Tennessee.

Engineers from Kansas-based Cessna Aircraft Company lead of a national group of experts from education and the aviation/aerospace industry in developing the curricula for this aviation-themed design project. Other contributors include the Federal Aviation Administration, the U.S. Department of Energy's Office of Science, Build A Plane, and many others.

Students and teachers in high schools across the state will form teams to work on this Real World Design Challenge and will also participate in local and state competitions. A winner will be announced to represent Kansas in the final competition to be held at the National Academy of Engineering in Washington D.C.

To participate in the program, teachers must attend a two-day training course to learn to use the PTC CAD software. Cost of the training course is free to Kansas teachers, compliments of Cessna Aircraft Company. Participants completing the training will each receive more than \$900,000 worth of the CAD software to use in their classrooms and in the Real World Design Challenge. The software comes with free lifetime updates.

For more information on the Real World Design Challenge visit the KSDE website at <http://www.ksde.org/Default.aspx?tabid=2878>

Board Member Spotlight

Dr. Karla Childs is an assistant professor in the mathematics department at Pittsburg State University in Pittsburg, Kansas. She studied at the University of Arkansas in Fayetteville, Arkansas and graduated with a Bachelor of Science degree in mathematics education in 1978. Ms. Childs attended Harvard University in Cambridge, Massachusetts during the 1976 summer semester and the 1984 summer semester. She received a Master of Science degree in higher education with the Graduate Dean's 4.0 scholastic honors from Pittsburg State University in May, 1993. In 2006 she received her Ph.D. with co-disciplines in Mathematics and Curriculum and Instruction at the University of Missouri-Kansas City.

Ms. Childs began her career in mathematics education teaching mathematics and computer programming at Joplin High School in Joplin, Missouri. Since 1991 she has taught in the mathematics department at Pittsburg State University.

Ms. Childs is a member of the National Council of Teachers of Mathematics, KATM, MAA, Kappa Mu Epsilon National Mathematics Honor Society, AMTE and Phi Kappa Phi National Honor Society.



Karla Childs is the Zone 4 Coordinator. Zone Updates can be found on page 9.

Commissioner Posny, Partnership for 21st Century Skills Highlight KLFA

The Kansas Learning First Alliance met August 21 and 22 to kick off its 2008-2009 year of work with a renewed focus on action to bring 21st century learning opportunities to every public school student in Kansas. Joined by numerous guests from the Kansas State Board of Education and the Governor's Pre-school-Grade20 (P20) Council, Alliance members received welcome from Commissioner Alexa Posny. Two members of the national Partnership for 21st Century Skills Board, Kathy Hurley (Pearson Education) and Lillian Kellogg (Education Networks of America) outlined key initiatives to infuse a rigorous basic curriculum with the 21st century skills students will need for success. More than 50 representatives and guests from over 25 of its organizational members attended the meeting, held at the Kansas NEA office.

Friday morning included significant work time for strategic planning by the three work groups of KLFA. Community Engagement, Professional Development, and Student Achievement workgroups each developed both short-term action ideas and initiated long-term planning. Ideas for action included:

- building community readiness for change in our schools
- infusing curriculum standards and indicators with 21st century knowledge, skills, and dispositions
- developing a new vision for teaching and learning with school faculty
- creating the infrastructure to support new outcomes and strategies
- instituting professional learning communities for collaboration and integration
- advocating for assessment of what matters, integrated in ongoing teaching/learning rather than as an add-on event.

Schools and districts are encouraged to contact KLFA leaders to schedule workshops or presentations to engage communities and school faculties in deep conversations about the needs of students and the resources for schools and teachers in the 21st century.

Working along with staff from the Kansas State Department of Education, KLFA will meet in October to review descriptions of what the graduate with 21st century skills should know and be able to do... and what kind of learning environment is needed for our schools and classrooms to achieve these challenging results. The next meeting is October 9, 2008 at KASB.

COMPUTING COMBINATIONS FOR PAIRS

David R. Duncan and Bonnie H. Litwiller

If you have an idea you would like to share with KATM Members, please submit articles in Word format to lyoung@fhsu.edu

Mathematics teachers are always on the lookout for novel connections. We present two such settings involving pairs:

Drew buys a package of eight jogging socks, all identical.

- How many pairs of socks does he actually have? Since any two of the eight socks will

constitute a pair, Drew has $C(8,2) = \frac{8!}{(6!)(2!)} = 28$ pairs.

- If one sock wears out, how many pairs does Drew now have?

Since seven socks remain, he now has $C(7,2) = 21$ pairs. Another approach to this result is to note that the worn out sock was initially paired with each of the other seven socks. Hence, seven pairs of the original 28 pairs are no longer available - 21 pairs remain.

- As additional socks wear out, Drew would have successively:

$$C(6,2) = 15 \text{ pairs}$$

$$C(5,2) = 10 \text{ pairs}$$

$$C(4,2) = 6 \text{ pairs}$$

$$C(3,2) = 3 \text{ pairs}$$

$$C(2,2) = 1 \text{ pair}$$

Note the appearance of the triangular numbers in this problem.

Laura likes a particular style of shoe. When she finds this shoe on sale, she buys four identical pairs.

- How many pairs of shoes does Laura actually have?

This problem differs from problem 1 in that of the eight shoes Laura bought, four are “left-footed” and four are “right-footed.” Consequently, to choose a pair of shoes, Laura must use one of each type. This selection can be done in 4×4 or 16 ways.

- Suppose that one of her shoes wears out. She now has seven shoes - three of one type and four of the other. The number of possible pairs is then $3 \times 4 = 12$ pairs.
- As additional shoes wear out, the number of possible pairs depends upon the number of each type remaining. These numbers of pairs may be:

$$\begin{array}{cccc}
 4 \times 2 = 8 & 3 \times 2 = 6 & 2 \times 2 = 4 & 1 \times 1 = 1 \\
 4 \times 1 = 4 & 3 \times 1 = 3 & 2 \times 1 = 2 &
 \end{array}$$

Note the appearance of the rectangular numbers in this example.

Teachers and their students are encouraged to find other applications that connect mathematics to the real world.

Combinations and permutations can be difficult concepts for students.

The fruit salad is a combination of peaches, watermelon, and grapes. We do not care what order the fruit is in.

The combination to the safe was 862. The word combination is still used but the order of the numbers is very important if I am to get into the safe. This is a permutation.

Combination – order doesn't matter

Permutation – order matters.

$${}_n P_r = \frac{n!}{(n-r)!}$$

$${}_n C_r = \frac{n!}{r!(n-r)!}$$

David R. Duncan and Bonnie H. Litwiller are Professors of Mathematics at the University of Northern Iowa in Cedar Falls. They can be reached at david.duncan@uni.edu or blitwiller@math-cs.cns.uni.edu

ZONE NEWS

ZONE 1: Kathy Desaire (kdesaire.usd269@ruraltel.net)

Western Kansas Math Conference presented by SWPRSC

"Teachers Change Lives 24/7" with Jim Burgett

October 15, 2008, 8:30 am* - 3:15 pm *registration @ 8:00 am

Liberal High School

1611 West 2nd

Liberal, KS

More information at www.swprsc.org

ZONE 2: Deb Nauerth (DEBN@manhattan.k12.ks.us)

Greetings from Zone 2 and your new Zone Coordinator! My name is Deb Nauerth and I have lived in Manhattan for 28 years. Go Wildcats! This is my 13th year teaching. Through the years I have taught 6-8 Science, K-6 Resource Room and K-12 Gifted Education. Currently, I am a K-6 Gifted Education Teacher serving 3 buildings. I enjoy walking, hiking, bicycle riding, reading, scuba diving, traveling, and spending time with family and friends.

Isn't it hard to believe the hustle, bustle and excitement of the 2008/09 school year is already upon us? I am excited to take an active role in the KATM Board to see change in action and help cultivate a professional organization that provides valuable insights and mathematics leadership. Please let me know if I can be of any assistance. I look forward to meeting and serving you.

ZONE 3: Pat Foster (pfoster@usd341.org)

Zone 3 members can check out our new webpage. Go to the KATM website and click on the link provided. News and other information will be posted periodically to keep members up to date.

The Northeast Kansas Association of Teachers of Mathematics have scheduled several meetings throughout the year. Following is a list of meeting times, locations, and topics. Please join us. If you have any questions, email Pat Foster at pfoster@usd341.org.

October 16, 2008: Shawnee Heights Middle School

The discussion will be centered around strategies for struggling learners and finding the time to implement those strategies.

January 13, 2009: Curriculum Resources Center, Washburn University

Available materials will be shared to encourage teachers to use this valuable resource.

March 3, 2009: Seaman Middle School

The Annual Pi Day Celebration will be held and practical ideas for celebrating Pi Day in the classroom will be shared.

ZONE 4: Karla Childs (kchilds@pittstate.edu)

JOIN US! The 2008 MOKAN Secondary Math Conference is Tuesday, September 23, 2008. Put a request in with your principal and send your registration form in now. No worries...if you didn't receive a registration form you can still attend. Either fill out the attached form or just reply to this email and I will register you! This year the conference will be held at PSU and topics included for presentation and discussion are:

Cooperative Learning in the math classroom, Smartboard mathematics lesson presentations, Mathematics Presentations from Pitsco, Facebook for MOKAN, Kansas State Department Mathematics Consultant, Planetarium Show, Information from the American Statistical Association about the 2008 poster competition. We're also planning a vendor area and door prizes! Hope to see you Tuesday, September 23, 2008.

ZONE 5: Jennifer Weilert (jweilert@usd259.net) SCKATM (South Central Kansas Association of Teachers of Mathematics) had a successful Spring Social in April. Dozens of math teachers from Wichita and surrounding districts met at a local restaurant in Old Town to enjoy food, fun, and networking with each other. Several lucky people won fantastic door prizes, such as KATM memberships, IPODs, digital cameras, and gift cards to book stores. It was a great time for all!

SCKATM will be hosting the 3rd Annual *Math at the Zoo* event on October 4 at the Sedgwick County Zoo from 9:00-12:00. All teachers in and around Wichita are invited. Those who attend receive free admission to the zoo that day for their families. Teachers can enjoy morning refreshments and choose from several sessions that will be presented by their peers. It will be a wonderful opportunity to network with others, pick up a new teaching strategy or two, and have fun at the zoo!

ZONE 6: Tracy Newell (tnewell@gckschools.com)

Western Kansas Math Conference presented by SWPRSC

"Teachers Change Lives 24/7" with Jim Burgett

October 15, 2008, 8:30 am* - 3:15 pm *registration @ 8:00 am

Liberal High School

1611 West 2nd

Liberal, KS

More information at www.swprsc.org

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