Kentucky Council of Teachers of Mathematics

April 2003

Message from the President

Welcome to the KCTM Newsletter. This is an issue of firsts: first on-line newsletter, first newsletter for me as the new President, and first issue produced with a deliberate effort to incorporate more ideas from our affiliates and vice-presidents at each of the four levels of education. I want to elaborate on each one of these firsts.

Our first on-line edition of the newsletter provides us with many new opportunities. Because the newsletter is on-line, we can include many more pages of materials than a print newsletter. I foresee website links and links to expanded documents in future editions. An on-line newsletter also reduces the time necessary to print and mail the newsletters, so we anticipate more timely information reaching the intended audience.

Keeping your membership current will be vital to the ability to access the newsletter in the new format. Most of you arrived at this newsletter through receiving a postcard with a password. Please check the postcard right now and note when your membership expires. If your membership has expired, please download a membership form right now and send in your yearly dues. Postcards were sent to all members of our database; however, we will be purging the database of members who are not paid to date, and you will no longer receive the postcards or other mailings if you do not update your membership. We will continue to send out first class mailings with conference registration information to all paid members.

With this being my first newsletter as President, I wanted to tell you a bit about me. I am a high school teacher at Scott County High School, in Georgetown, KY. I have been teaching for eight years, and I have primarily taught algebra to the "low motivated" students. I also enjoy working with pre-service teachers, both student teachers and student observers. I believe that attending professional development workshops and conferences (NCTM and KCTM meetings, T^3 conferences, etc.) are vital to maintaining a current knowledge base, and I believe that good teachers strive for continuous improvement. I am "in the educational trenches" with you, and I celebrate and struggle with the same issues you do.

A new focus of the newsletter is to highlight a lesson used at each of the four levels of mathematics (college, high school, middle school, and primary) and to highlight the activities of each of the regional affiliates (NKCTM, WKCTM, EKCTM, CCTM, GLCTM, and LCTM). Be sure to read John Ashurst's "teachable moment" regarding the fate of an unfortunate swimmer. We hope that you find the lessons useful and the updates informative. Feel free to submit your own lesson to your affiliate representative or the vice-president at your level. If you aren't sure who that person would be, just ask.

I am excited to be writing my first "From the President" letter, and I am looking forward to working with the excellent board members who guide KCTM.

See you in the classroom!

Lori Durham
ldurham@scott.k12.ky.us

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The Case of the Struggling Swimmer

A Variation on Constructivism

John Ashurst, Harlan County Public Schools

Recently, I walked into one of my high school algebra classes and declared the following to the class:

"You know how some newspaper articles begin on the front page and conclude on another page?" After pausing for their response I continued, "I was reading a brief article yesterday and wanted to share it with you." I read the page-one portion of the article, and then declared that it was concluded on page seven. "Unfortunately, page 7 was a page I could not read! An unexpected cola spill had rendered several pages of the newspaper unreadable, and I had thrown them in the trash."

TOURIST TRAPPED BY TUG OF CURRENT

Just after high tide, 1:37 PM, yesterday, lifeguard Rikki Foley blasted her air-horn to alert neighboring lifeguards as she simultaneously jumped from her lifeguard chair in an effort to rescue a struggling swimmer. Joe T. Rist, address unknown, was approximately 50 meters away from shore and about 120 meters north of Foley's station when

Please see FOLEY, Page 7

Some students asked several questions and theorized about the outcome. Others began chatting about their personal experiences while vacationing at the coast. Gradually, they became refocused on the situation at hand as they asked a variety of unsolicited questions such as "Did the lifeguard save the swimmer?" My not having the answer to the more obvious questions led the students to speculate about the parameters of the situation. A few of their questions, and my responses, were:

- **"Tell us again how far away the swimmer was from shore?"**
  50 meters from shore and 120 meters up-shore from the lifeguard.
- **"How fast could the lifeguard run?"**
  How fast do you think the typical lifeguard runs?
  What is your running speed?
  Would you like being a lifeguard?
- **"How fast could the lifeguard swim?"**
  How fast do you think a lifeguard could swim in the ocean?
  What is your swimming rate?
  How is this rate determined?
- **"How far did the lifeguard run up the beach before entering the water?"**
  What difference would that make?
- **"How long could a person survive when struggling in the ocean?"**
  What do you think?
  What factors should be considered?
  How long could you survive without assistance?
  What do you mean by buoyancy?

The students asked if we could postpone whatever was planned for the day and give them time to further investigate the plight of the struggling swimmer. After their urging, I agreed to allow them enough time to work in small groups and continue their investigation. Of course this was the intended activity for the day, but in the spirit of Tom Sawyer when given the task of whitewashing a fence, I saw no reason to reveal this information.

From their personal experiences, the students concluded the lifeguard's swimming rate would be less than the running rate and voted to calculate it at 45% of the runner's rate. To determine a likely running speed for the lifeguard, they decided to time various members of the class as they ran down the hall. (Yes, they agreed that running down the hall at school was not the best model for a barefooted person running on wet sand and debated whether to adjust their findings.)

There was no lecture or demonstration in this lesson; just a given situation and an opportunity to create their own problem to solve. The question, "Was the swimmer saved?" seemed so obvious to each member of the class that there was no reason to pose it as a formal question from the teacher. That would have restricted student thinking and the events of the day would have been little more than another assignment. Moreover, could we determine whether the swimmer was saved, or were we limited to determining the shortest amount of time required for the lifeguard to reach the swimmer? Again, the latter question sparked discussion that produced many more questions than answers, and each time this occurred, we discussed how we could reinvestigate. At this point, redoing the math and determining a specific outcome was of little interest. In fact, it would have only slowed the process of generalizing, i.e. how altering the run or swim rate for the lifeguard would affect the rescue time.

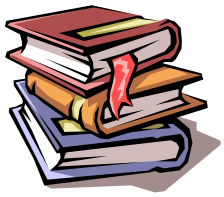
At this point, it seems appropriate to trace the data collection process of my students, to analyze their application of the TI-83 Plus for the analysis of data, and to summarize the mathematical procedures used by the various groups. This would be disastrous! It would immediately say to the reader of this article that there is a preferred process to be followed. It would say to the reader that I don't want you to think for yourself or ponder how your students would address this situation. It would say that I don't want you to connect this situation with previously learned mathematics or to formulate and test your own mathematics. It would say I don't want you to show your work – but that I want you to reproduce my work. In fact, if I leave the reader with a mystery, the reader is much more likely to consider using the activity, or a

variation thereof, in the classroom.

This variation on a process known as Constructivism has been most useful for me and even more enjoyable for my students. To read more about Constructivism and how it can become the strategy that excites and motivate your students, take time to peruse one or more of these web sites.

Constructing Knowledge in the Classroom.
http://www.sedl.org/scimath/compass/v01n03/1.html
CONSTRUCTIVISM from Philosophy to Practice.
http://www.stemnet.nf.ca/~elmurphy/emurphy/cle.html
Constructivism in the Classroom
http://mathforum.org/mathed/constructivism.html
Essays on constructivism and education.
http://www.towson.edu/csme/mctp/Essays.html

Scaffolding Instructional Strategies from Traditional to Constructivist Learning Environments.
http://www.cwrl.utexas.edu/~syverson/worldsfair/exhibits/hall3/strickler-wynn/resources/constructivism/constructtheory.htm



Reading in Math Class??

"You expect me to teach reading? I don't think so! " Rhonda Niemi, JCPS

I can't begin to count the number of times I have expressed exactly these sentiments. But it wasn't until I began teaching the Connected Mathematics program did I realize that I can no longer ignore the importance of reading in the content areas. One of my professional goals this past year has been to incorporate reading strategies in mathematics classes.

As a result of my research on reading in the content areas and networking with colleagues, I have learned that it is not really my job to **teach** reading. Rather, it is my job to help students to **make sense** of the mathematics they read. Reading mathematics requires different skills than other content areas. One needs to decode and comprehend symbols and graphics. To further confuse students, information is presented in a variety of ways: left to right, right to left (number lines), top to bottom (tables) or diagonally (graphs). Given these challenges, it is no wonder that many students cannot successfully read mathematics text.

As a result of my research, I have discovered a few strategies that have proven beneficial to me.

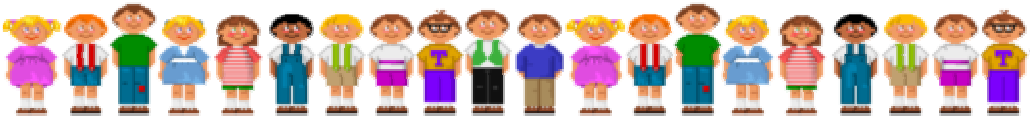
- Graphic Organizers, such as webs, Venn diagrams, and concept definition maps, can be used to compare / contrast, classify, and identify common characteristics.
- Vocabulary: Laminate words on color-coded paper according to the strand in mathematics. Have students write a definition in their own words and discuss with their peers. On the laminated paper, write the agreed upon definition and a graphic representation or example of the term. Post the vocabulary words throughout the room.
- Develop an anticipatory guide for a more difficult reading selection. Create questions that will identify the students' prior knowledge, their common misconceptions, and key points they will read about.
- Math textbooks do not always follow the principles of writing that students have learned in Language Arts. For example, the main idea may not appear in the beginning of a word problem or cue words might not be used. It is important to make students aware that reading math textbooks is different from what they might have learned about reading in general.
- Model "think alouds" with students. The teacher reads aloud and verbalizes his / her thinking while reading the passage. Ask students to read and "think aloud" to the class.
- Have students "pair-share": Take turns reading / listening to each other and discussing what they know or don't know.
- Prepare a bookmark with tips for reading mathematics for students to place in their math book. An article entitled, "Making Math Make Sense" by Doug Buehl sites this strategy. The bookmark is entitled: Keys to Reading Math and includes the following tips:
  1.) Read carefully and make sure each sentence makes sense.
  2.)Try to summarize what you read, in your own words.
  3.) When you encounter a tough word, try thinking of easier words that mean the same thing and substitute the word.
  4.) Talk over what you read with a partner to make sure you get it right and to clear up anything you don't understand.
  5.) Be on the lookout for things the author thinks you already know and things you have learned in math before.
  6.) Read with a pencil - Work the examples as you read them.

As educators, we are obligated to prepare students for the informational world and we are federally mandated to narrow the achievement gap. The challenges facing teachers in this diverse world are compounded as a result of more ESL students and students with other special needs. We are no longer solely teachers of mathematics; we are teachers of the whole child.

Resources:
Barton, M.L.& Heidem, C. (2002) Teaching Reading in Mathematics (2nd ed). Aurora, CO: Mid-continent Research for Education and Learning.

Barton, M.L., Heidema, C. & Jordan, D. "Teaching Reading in Mathematics and Science". Educational Leadership. Association for Supervision and Curriculum Development. 60(3), 24 – 28.

Buehl, Doug. "Making Math Make Sense". The Reading Room. October 1998



Teaching Tips

Kathleen Wonderling, Dixie Heights High School
I choose everything by rolling dice. I have 4,6,8,10,12,and 20 sided dice. I use these to select which team goes to the board (8 teams).

Who within a team turns in homework (4 people to a team). If I roll 1 - 4,that person turns in their own homework as a representation of the team. If the die rolls 5 or 6, I don't pick it up. Do I want class notes? Roll even, odd, divisible by 3, etc. No one ever says I'm picking on them. Everyone feels they have a chance of things going their way. Very Positive.

Penny Roberts, Greenville Elementary School
Angle Plates: Two different colors of paper plates are used and cut from the outer edge to the center point, then slid together. The plates can then be used to represent different types of angles. For starters, they can simply be used to form acute, obtuse and right angles to check for understanding. Once students have internalized the angles of varying pattern blocks, the plates can be used as an estimation tool to form an estimated 30, 60, 90 degree angles and so on. To check for accuracy, the students place a vertex point of the pattern block into the center vertex point of the plastic plate angle to see how well they estimated.

Geometry Riddles: Students place their hands in a bag without looking and try to find a pattern block according to feel that meets the conditions of the riddles. EX. Two of its sides are the same length. It has one square corner. This can also be done with geoboards.

The Math Project Journal

The Math Project Journal is published 6 times a year and is a wonderful resource for high school math teachers. This small magazine is full of math projects including length of time, clues, tips, and area the project covers. This magazine includes a sight license; you are encouraged to make copies for others at your school. For more information contact:

Maggie McGatha, Ed.D.
College of Education
Northern Kentucky University
Highland Heights, KY 41099
Phone: 859-572-6902
Email: mmcgatham@nku.edu
Webpage: http://www.nku.edu/~mcgatham

COMPASS (Curricular Options in Mathematics Programs for All Secondary Students)

Compass is co-hosting a national conference in Chicago June27-29. The conference will showcase middle and high school standards-based curricula.
It will be aimed at teachers, administrators, state education personnel, and teacher educators. Further info at:

www.ithaca.edu/compass

or 800-688-1829

or write Katy Duggan-Haas kdugganhaas@ithaca.com

New Reference Sheets

The reference sheets for the Mathematics part of the Kentucky Core Content Test have been revised. Copies of the revised sheets are can be viewed at these links: Grade 8 Reference Sheet and Grade 11 Reference Sheet.

Reports from Affiliates

WKCTM

Wanda Weidemann, Western Kentucky University

WKCTM's fall meeting is tentatively scheduled for Sept. 8 from 4:30-7:30 p.m. The theme of the conference will be "Math the Hands-On Way." Participants will have a choice of two 75-minute sessions, each of which will involve the use of technology or manipulatives. For further information (including final location), contact Wanda Weidemann by email at wanda.weidemann@wku.edu. Teachers should contact their P.D. coordinators about professional development credit.

LCTM

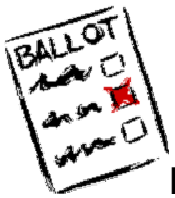
Debbie Waggoner, Eastern Kentucky University

The Lexington Council of Teachers of Mathematics, LCTM, sponsors workshops each winter/spring.
This year we had over 85 participants K-12 to attend workshops held at Lafayette and Henry Clay High Schools on February 26th, 2003. LCTM provided teachers sessions on using Two-Color Counters Venn Diagrams, and Number tiles for Algebra. LCTM also helped to sponsor our regional mathematics textbook showcase on January 28th, 2003 at P.L. Dunbar High School.

LCTM sends members a monthly newsletter that includes current information and articles from members, sample activites, puzzles, problems, and websites. Each month Fayette County Mathematics Specialist, Natalee Feese, has her favorite problem of the month and the first member to e-mail her a solution wins a great prize. Congratulations to Natalee and her family on the birth of Nate Feese on March 24th, 2003. This also means LCTM President-Elect, Bev Dean, Fayette County Elementary Mathematics Specialist is keeping extra busy.

LCTM also sends congratulations to Evelyn Christensen who is not only the Secretary of LCTM but has recently published 5 new mathematics books available at www.MINDWAREonline.com: Multiplication Mosaics, Division Designs, and Venn Perplexors (Levels A, B, & C).

If you wish to join LCTM, the membership fee is $8.00 each year and you may send your renewal to CARMEN RADER-BOWLES, LCTM Treasurer, 1837 ENDON DRIVE, Lexington, KY 40505.



Nominations Being Accepted for Fall 2003 Elections

The following board positions will be elected in the fall of this year: Vice-President College, Vice-President Primary, and Treasurer. If you would like to nominate yourself or someone else for a position, please submit your name to one of the Elections Committee Members listed below. Deadline for nominations is August 15, 2003.

Not sure what the job would entail? Contact the current officers in these positions, and they can explain what is involved. These names can be found on the website under “KCTM Officers.”

The Elections Committee is made up of the membership chair (Ruth Casey, ruthcasey@aol.com) and the two vice-presidents in the first year of their two-year terms. This year, those people are Rhonda Niemi (rniemi1@jefferson.k12.ky.us) and John Ashurst (jashurst@harlan.k12.ky.us). Contact one of these people with your nominations.

Speakers Needed

Consider volunteering to share some teaching ideas at the KCTM Fall Conference at Ryle High School in Union, Kentucky on October 25. Click here for the Speakers Form.

Amy Herman, Editor

Kathy Mowers, Website Adaptation

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