Columbus State University
Columbus Regional Mathematics Collaborative

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CRMC News

FALL, 2006

Grapes of Math Author Speaks at CRMC

Greg Tang, author of children's books, *The Grapes of Math, Math Potatoes, The Best of Times*, and others, visited Columbus October 2-4 to participate in the Columbus Regional Mathematics Collaborative's fall events. Tang began his Columbus Math Tour with a presentation to students in Dr. Sallie Miller's reading class. He shared poems and mathematics from several of his books, including material from his soon to be published *Math Fables, Too!* The students enjoyed hearing Tang's philosophy of teaching mathematics as well as his ideas about incorporating new vocabulary into his poems. Afterwards, Tang toured the Math Collaborative and met with the CRMC staff.

Greg Tang, Author, speaks at CRMC's Fall MathFest

On Tuesday, October 3, Tang spent the day sharing his ideas about mathematics with students, teachers, administrators, University personnel, and parents. He visited Brewer Elementary in the morning and Georgetown Elementary in the afternoon where he made presentations to groups of students. Over 250 students at these schools had the opportunity to interact with Greg Tang and experience his mathematics teaching. Later in the afternoon Tang participated in a book signing at the Columbus Public Library, where teachers, parents and students had the opportunity to talk with him and have books signed. Several young people even had the opportunity to play Tang's mathematics card game, NumSkill jr., with him. Several local school administrators and University faculty had the opportunity to visit with Tang during breakfast and lunch meetings hosted by the Math Collaborative.

Tang was the keynote speaker on Tuesday evening for the Collaborative's annual Fall MathFest held at CSU's Cunningham Center. Approximately 200 people attended the dinner event which included a keynote address by Tang. A separate session for children in grades K-5 was led by students from CSU's College of Education. The children enjoyed a variety of mathematics activities that were related to children's literature selections while teachers, parents, University faculty, and pre-service teachers enjoyed Tang's entertaining presentation about teaching children to have a better understanding of numbers. Following the keynote presentation, elementary teachers and parents watched Tang work with the K-5 children while middle grades and high school teachers participated in sessions led by local master teachers. Kenneth Jones, CRMC Director said, "We were extremely excited to have such a large turnout for MathFest. I hope the interest generated by Greg Tang's presentation will encourage teachers and parents to look for additional ways to help students do better in mathematics."

On Wednesday, October 4, Greg Tang was the major presenter at the Math Collaborative's Fall Joint Workshop. This workshop was part of the Collaborative's Building Bridges grant projects funded through the Teacher Quality Program at the University of Georgia. Tang presented the opening session to approximately 120 teachers in grades K-12. He shared ideas for developing a deeper understanding of place value with students, which he says forms the foundation for understanding mathematics from counting to calculus. During the day he also presented a session for elementary teachers on developing students' understanding of algorithms for addition and subtraction. During a session with middle grades and high school teachers he addressed understanding algorithms for multiplication, generalizing arithmetic algorithms to algebra, and developing conceptual understanding of division of fractions.

"Teachers were inspired by Greg Tang's enthusiasm for mathematics. His entertaining and humorous presentations were engaging and got teachers to think about how they teach mathematics," said Jones. Jones expressed appreciation to Dr. George Stanton, CSU's Vice President of Academic Affairs, for providing the financial support that enabled the Collaborative to bring Greg Tang to Columbus. In conjunction with Tang's visit, the Collaborative sponsored a book fair with Barnes & Noble Booksellers. The Collaborative earned over $500 from the book fair, which will help support future CRMC events.

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Director's Message

Do you remember those lazy, hazy, quiet days of summer? They probably seem a distant memory now that you are well into a new school year. They certainly seem a distant memory for all of us here at the Collaborative since we are well into a busy fall of workshops and activities. Attendance at all of our events this year has been up and that is keeping us busy. We want you to help keep us busy.

Kenneth Jones

When things are busy it is easy to think that there is not enough time to sit back, take a break, relax, and gather your thoughts. Research shows that, in general, people are much more productive in the long run when they take time to relax and let their brains catch up. I have to remind myself of this sometimes.

As teachers under the pressures of AYP and NCLB, it is sometimes tempting to think that taking time away from class to attend professional development may reduce student learning. I don't believe that is necessarily true. When teachers have the opportunity to spend time with other professionals engaged in worthwhile professional development, the renewed energy and ideas for innovation you gain may actually improve your ability to meet the needs of your students.

This is an exciting year for mathematics teachers in this area. Not only do you have access to the professional development available through the Collaborative which we hope meets your needs, but the National Council of Teachers of Mathematics Annual Meeting is in Atlanta this spring. Make plans now to attend at least a part of this event, March 21-24. This is an outstanding opportunity to see and hear presenters from all over the country and you are sure to come back to your class with exciting new ideas to engage your students.

As you work hard this year to make AYP and leave no child behind, make sure you take the time for you to learn something new. The time you invest in your learning is sure to pay dividends with your students.

Building Bridges Follow-up Dinner Begins New School Year

Approximately 60 area teachers, administrators, CSU faculty members, and CRMC staff attended a dinner meeting on August 31 to kick of the school year follow-up portion of the Collaborative's Building Bridges grants projects. The dinner was held at the Elizabeth Bradley Turner Center for Continuing Education.

CRMC Director, Kenneth Jones, welcomed everyone to the meeting and introduced the CRMC staff and CSU faculty members in attendance. CSU faculty members attending were Dr. David Rock, Dean of the College of Education, Dr. Kitty Fouche, Director of the Centers of Excellence, Dr. Debbie Gober, Chair of the Department of Teacher Education, Dr. Tim Howard, Chair of the Department of Mathematics, Dr. Deirdre Greer and Ms. Gayle Herrington, faculty members in Teacher Education, and Dr. Cindy Henning, Interim Associate Dean of the College of Science. These faculty members provide frequent guidance to the Collaborative in program planning and serve as guest presenters at project events.

After dinner, Dr. Rock presented "Math Is NOT a Four Letter Word." He began by talking about NCLB and NEAP and provided statistics about Georgia's ranking. He then gave a four-letter mathematics word for each letter of the alphabet. His journey through the alphabet provided an entertaining and motivational look at the importance of being able to do mathematics. His talk motivated those present to begin their journey to Build Bridges to create a more mathematically literate society.

Jones provided an overview of the Building Bridges grants projects and outlined benefits and expectations for teachers and schools participating in the school year follow-up portion of the projects. Schools were selected for participation in this phase of the projects based upon their attendance at the summer workshop, administrative support, and an expressed desire for continued professional development. Georgetown Elementary and Hannan Academy are serving as follow-up sites for *Building Bridges and Digging Deeper in Elementary Mathematics.* Fort Middle School, Faith Middle School, and South Girard School are follow-up sites for *Building Bridges from Instruction to Assessment.* Columbus High School and Troup High School are follow-up sites for *Building Bridges to Performance Standards.*

In addition to attending the Math Collaborative's two all-day workshops at CSU, teachers at these schools will participate in after-school workshops at their schools, work with CRMC resource teachers to plan and present demonstration lessons, participate in videotaped lesson study, and create portfolios of lessons taught in their classrooms.

Dr. Rock presents "Math is NOT a Four Letter Word"

One goal of all three projects is to expand and develop teachers' mathematics content knowledge. Another is to develop teachers' abilities to use effective questioning to engage students in mathematical discourse. Each project has an additional objective that is specific to the project. The elementary teachers will focus on making connections between children's literature and mathematics. Middle grades teachers will focus on using and developing rich mathematical tasks for both instruction and assessment. The high school teachers will implement instructional activities modeled after the GPS into their current courses.

Summer Workshops

The staff of the Math Collaborative is busy building bridges this year. The three grants projects, *Building Bridges and Digging Deeper In Elementary Mathematics, Building Bridges from Instruction to Assessment in Middle Grades Mathematics,* and *Building Bridges to Performance Standards in Secondary Mathematics* began in June with a summer workshop on the Columbus State campus. Twenty-six elementary teachers, 14 middle grades teachers, and 14 high school teachers attended the weeklong workshop, June 5-9.

Teachers from all grade levels met together each morning for a large group session led by CRMC Director, Kenneth Jones. After a morning warm-up problem using manipulative samples donated by ETA/Cuisenaire, participants worked together to explore the topic of using effective teacher questioning to improve student performance. The questioning focus revolved around a big problem that the teachers worked on throughout the week. The Candles Problem from Mark Driscol's *Algebraic Thinking Toolkit* provided participants with an opportunity to engage in active problem solving, utilize algebraic thinking strategies, explore multiple approaches, and communicate mathematical thinking. Teachers were able to see how the same problem could be approached and solved using various methods by students across all grade levels. One teacher told Kenneth, "I was a little frustrated when you didn't give us the answer at the end of the first day, but I kept working on the problem all week and I was excited that I was finally able to figure it out." Kenneth said, "It was exciting to hear teachers talking about mathematics with one another and sharing approaches and strategies, even during breaks and at lunch. That's ultimately what we want to try and get students to do."

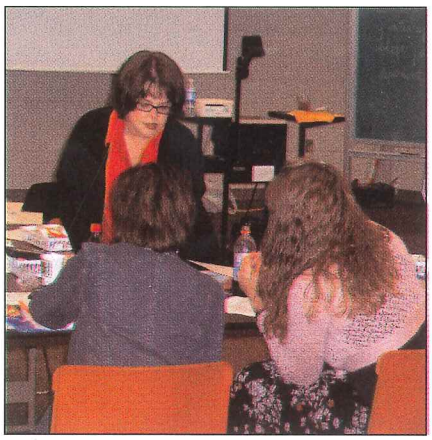
Elementary Teachers Work Candle Problem

After the morning general session, participants spent the rest of the day working in grade level groups. CRMC elementary resource teachers, Cynthia Hill, Shannon Lewis and Kimberly Voltz, led the elementary sessions. The elementary teachers focused on mathematical connections to children's literature and on developing mathematical understanding through hands-on activities. Dr. Deirdre Greer, Assistant Professor of Teacher Education at CSU, led a session on problem-solving strategies. Dr. Debbie Gober, Chair of the Department of Teacher Education, presented a session on how the Japanese use pictures and diagrams to help students develop mathematical understanding.

The middle grades workshop was led by CRMC middle grades resource teacher, Hope Phillips, and Ruby Tucker, a retired master teacher from Muscogee County. An atmosphere of engaging conversation and productive learning took place with teachers from Harris County, Muscogee County, Fort Benning, and Phenix City schools participating. Each day, a different content strand of the Georgia Performance Standards (GPS) was addressed. A main focus of the week was teachers learning to use rich problems to teach selected geometry and algebra content that was previously part of the high school curriculum in Georgia. Participants used Geometer's Sketchpad™, the TI-83+ graphing calculator, and various manipulatives to enhance the teaching/learning of these and other GPS objectives. Participants literally "played in the sand" to discover how rotating certain plane figures produces three-dimensional figures. Selected children's literature books, including *The Village of Round and Square Houses* and *Tikki Tikki Tembo,* were used to introduce geometry and data analysis concepts.

The middle grades teachers worked on a variety of open-ended tasks modeled after the new GPS. They focused on developing teachers' knowledge of topics that require deeper coverage at the middle school level, according to the new standards, such as geometry, statistics and algebraic thinking.

Northside High School teacher, Nancy Mims, and Kenneth Jones led the high school workshop. Teachers explored a variety of open-ended problem solving tasks similar to those being used in those courses that have already implemented the new GPS. The goal was to explore how some of these tasks could be integrated into current courses so that teachers could become comfortable with the GPS model of teaching prior to its implementation in the high school curriculum. The participants especially enjoyed the crime-solving activities from the NUMB3RS television show. Teachers also received a brief introduction to the TI-Navigator and to the statistical software package, Fathom™.



Wendy Sanchez Works With Teachers

Dr. Wendy Sanchez, Kennesaw State University, was a presenter for one day of the workshop. Dr. Sanchez has done a lot of work with open-ended questioning and is a frequent contributor to several National Council of Teachers of Mathematics publications. During the morning general session, Dr. Sanchez presented research and strategies for using more open-ended questions in the classroom. She then worked with each grade level group on modifying traditional assessment items to make them more open-ended and to give students an opportunity to demonstrate deeper understanding of mathematical content.

Participant evaluations of the workshops were very positive. Teachers across all grade levels expressed appreciation for the opportunity to see how they were building foundations for later mathematical learning or how they were expanding upon those foundations that had been developed in earlier grades. The feelings of many teachers are reflected in the comments on one of the evaluations. "This is really challenging me to think outside of the box. I realize that my understanding needs to go deeper so that I can transfer that to my students. I need to challenge myself and them to think more."

Students Learn Math and Have Fun At Camp

While many students were spending the first part of their summer sleeping late and watching television, approximately 70 students were learning mathematics in the context of fun and engaging activities in the Math Collaborative's summer camp program.

Elementary students in grades 2-5 enjoyed *A Journey Into the Unknown* during PRISM Camp, June 12-16. They explored mathematical patterns and algebraic thinking in the context of an undersea adventure. Using manipulatives like dominoes, pattern blocks, starfish, and seashells, they represented algebraic expressions and solved equations. CRMC's elementary resource teachers coordinated the camp which was taught by Amelia Hoag, Double Churches Elementary, Douglas Dickerson, Hannan Elementary, and Dawn Anderson, Georgetown Elementary. The culminating activity for the week was a fieldtrip to Monkey Joe's for some exciting math activities.

PRISM Students Explore Math with a Journey Into the Unknown

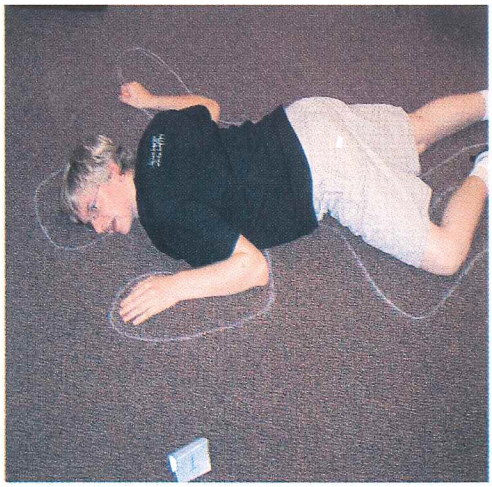
The Sights and Sounds of Mathematics was the theme for PRIME Camp which was held June 12-16. Twenty girls in grades six through eight were surprised to see how mathematics is involved in the arts. Mary Lou Wilson, Rothschild Middle, and Amanda Merritt, formerly of Academic Success Center and now Jordan High School, were camp teachers. Several guest speakers shared their artistic and mathematics expertise with the girls. Local architect, Julie Smith, discussed the use of the golden rectangle in architecture and gave the girls a "sneak peak" at her drawings of the new Burger King in Uptown Columbus. Professional quilters Teresa Singleton and Linda Camp helped the girls design their own quilt squares and discussed a history of quilting. With CSU music education graduate student Adam Mitchell, the girls created a rhythm tree from a whole note divided into half, quarter, eighth, and sixteenth notes. As the culminating project to a discussion of angles, the girls enjoyed making authentic kaleidoscopes. To remember the week, each girl designed her own unique camp T-shirt of colorful quilt squares using Geometer's Sketchpad™.

POWER Camp for middle grades boys also used the theme *The Sights and Sounds of Mathematics.* Christie Nestor taught the camp, assisted by Ben Bingham, a volunteer from Columbus High School, and CRMC summer volunteer worker, Darius Rogers. The boys enjoyed creating line designs using needle and thread, creating tessellations, designing works of art based on the fractional note values in a piece of music, and building a kaleidoscope. They also designed a building and used their blueprints to create their unique camp T-shirt. POWER Camp was held June 19-23.

One of the highlights for campers in both PRIME and POWER was the opportunity to create unique computer animations using the programming language Alice. Faculty and students from CSU's Department of Computer Science worked with campers two afternoons to help them learn the basics of this programming language and to assist them in creating computer animations in their selected virtual world. Each camper was given a copy of the software and a reference book for Alice. This aspect of the camps was made possible through the contributions of the local chapter of the American Association of University Women (AAUW) and the Department of Computer Science.

CSI:Mathematics was the theme for the ten high school students who participated in PSI Camp the week of June 12-16. During the week students gathered evidence and used mathematics to try and solve several crimes. Several of these crimes were based on activities from the popular CBS television show NUMB3RS. Campers used graphing calculators and CBL probes to find the pH of mystery substances and to explore the characteristics of different types of ink in their efforts to solve the crimes. A body on the floor and bullet holes in the walls required the students to explore bullet trajectories and angles in an attempt to identify the location of a mythical shooter. Nancy Mims, mathematics department chair at Northside High School, was the coordinator and lead teacher for the camp. Camp teachers Christine Jones, Columbus High, Steve Meredith, Beauregard High, and Catina Harvey, Atlanta's Eastpoint High, were assisted by CRMC summer volunteer worker, Farrah Shelly.

In addition to providing engaging and worthwhile mathematics learning activities for students, the camps offer teachers the chance to try out new lessons and new teaching strategies with students in a relaxed environment. The camps also provide teachers with the opportunity to team teach lessons with other teachers and to learn from one another.



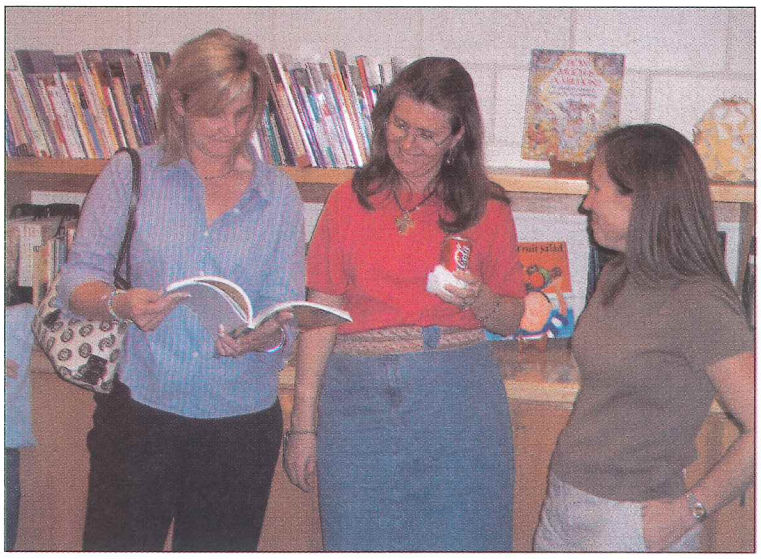
PSI Student Creates Crime Scene

Teachers Attend CRMC Open House

More than 30 area teachers and administrators attended the Math Collaborative's Fall Open House on September 21 from 3:00-6:00 P.M. The open house provided the opportunity for teachers to visit the Collaborative, view the many resources available for teachers' use, and meet the Collaborative staff. For the majority of the teachers attending, this was their first visit to the Collaborative. Many were amazed at the extensive library of resources available for their use and many took advantage of the opportunity to check out resources to use in their classrooms.

"We were delighted to see so many new faces at the open house," said director, Kenneth Jones. "I think many times teachers don't realize what all is available to them when their system joins the Collaborative. Once they get here and see all that is available, they are more likely to make full use of it."

Several schools encouraged teachers to attend by having the open house take the place of a regular weekly faculty meeting. Schools that were not able to attend this open house are encouraged to schedule a visit to the Math Collaborative for their faculties. The CRMC staff would be glad to host groups of teachers any afternoon.



Teachers View Materials at CRMC Open House and Share Ideas with Resource Teacher Kimberly Voltz

Future Teachers Visit CRMC

Future Teachers from Columbus High School Visit CRMC

Thirteen students from Columbus High School, who are interested in being teachers, recently visited the Math Collaborative. The students are taking Introduction to Teaching, taught by CHS mathematics teacher, Christine Jones. The students toured the Collaborative and learned about the resources available to help teachers. Ms. Jones said, "I've used a lot of the resources here. This is where I learned more about using the graphing calculators we used in math." While at CSU the students also visited the Childcare Resource and Referral Center and learned about the services they provide to the community and to CSU students and faculty.

The high school students were very interested to learn that Columbus State University is unique in having the resources of these two Centers of Excellence in its College of Education.

CRMC Staff Presents at Barnes and Noble

Shannon Lewis, CRMC elementary resource teacher, presented a mathematics and literature lesson at Barnes and Noble Booksellers in Columbus on Saturday morning, September 16. She presented a lesson using the book, *The Napping House* by Audrey Wood, to approximately ten children. Jennifer Sparks, Barnes and Noble Community Relations Manager said, "Shannon did a great job and the kids really enjoyed it. I just wish we had more kids."

Barnes and Noble worked with the Collaborative last year to hold the Math FUNtastics event at the Columbus Public Library. They partnered with the Collaborative again this year to hold a book fair in conjunction with Greg Tang's visit to Columbus. More than $2600 in books were sold at a book signing at the Public Library, at Fall MathFest, and in the store as part of the bookfair. The Collaborative earned over $500 from Barnes and Noble.

The Math Collaborative plans to have additional mathematics and literature events at Barnes and Noble on November 9 and December 7.

Pluses and Minuses Equal Staff Changes at CRMC

In July, CRMC said goodbye to long-time secretary and staff assistant, Terri Abrams. Terri accepted a promotion and moved across campus to Plant Operations to be a Facilities Assistant/Sign Maker. She also received her Bachelor of Arts degree in Communications from the University of Alabama this summer. CRMC Director, Kenneth Jones said, "Terri has been a tremendous asset to the Collaborative for many years. She knows almost everyone on campus and could always help us find the right person to get the job done. We will miss her at the Collaborative."

Chiquita Brock, the Collaborative's student assistant for the past two years, graduated from CSU with a degree in Criminal Justice in May. Chiquita was one of the best student workers the Collaborative has had. She was always very helpful and quick to do any job she was asked to do. We miss working with Chiquita but wish her all the best in pursuing her chosen profession.

Joetta Reeves
Staff Assistant

Joetta Reeves joined the Collaborative staff in August as the new staff assistant. Joetta comes to the Collaborative after many years of experience managing the local office of IBM. She has three children, two of them products of Columbus State University and one who is currently a junior at the University of Georgia. Her oldest daughter is teaching at Edgewood Elementary in Muscogee County. Joetta currently shares her empty nest with husband, Ronald. Joetta says she has been impressed by the family atmosphere of the CSU campus staff and looks forward to working with the wonderful people at the Collaborative.

Linda Hayes
Secondary Resource Teacher

Linda Hayes also joined the Collaborative in August as the new secondary resource teacher. Linda has many years teaching at the middle, high school and collegiate level. She retired from Central High School in Phenix City in 2000 and worked as the secondary resource teacher at CRMC during the 2000-2001 school year. Linda returned to the classroom the next year and has taught at Lee Scott Academy in Auburn for the past six years. She brings a wealth of experience and knowledge to the Collaborative. Welcome back, Linda!

Howard Giambrone became the new student assistant at CRMC once fall semester started. Because he plans to become a secondary mathematics teacher, he was excited at the opportunity to work in the Collaborative. We are glad to have him and know that he will have the opportunity to become familiar with a wealth of mathematics resources. Howard is in his second year at CSU.

Mathematics on the Web

Looking for ways to get your students involved in problem solving? Columbus State University recently unveiled a new mathematics problem solving contest for students and adults. Dr. David Rock, Dean of the University's College of Education, has operated a problem solving contest for several years. With his arrival at CSU the problem solving contest has found a new home. The site www.colstate.edu/mathcontest features a Problem of the Week, Algebra in Action, Middle School Madness, and an Elementary Brain Teaser. Students submit answers online and student names and schools with correct solutions are posted in order of submission. It is a great site to encourage your students to think about mathematics.

Looking for ways to learn additional mathematics content for the courses you teach? Check out online courses at www.online-mathcourses.org.

Looking for ways to integrate history into mathematics? Visit www.mathdl.maa.org/convergence/1/. You'll have to register to access the articles but registration is free.

Looking for real world applications and sources for performance tasks? Visit www.bced.gov.bc.ca/careers/aa/lessons/math.htm. These Canadian lessons offer good applications of mathematics and suggest valuable classroom explorations and problems.

Looking for activities and games to engage your students in problem solving? Visit www.exploratorium.edu/math_explorer. There are a variety of mathematics activities appropriate for a variety of grade levels. The Exploratorium homepage also has links to some outstanding science activities.

Looking for some outstanding performance-based lesson plans? Visit www.uen.org and view the teacher resources

Looking for great thinking games? See www.coolmath.com.

Do you have a favorite website that you use with your students? Send it to crmc@colstate.edu and we can share it with others.

Coming Soon to CRMC

Destiny Library Manager

Have you ever wished you could find out if a resource is available at the Collaborative while you are in your classroom or at home planning your lessons? Soon you'll be able to. With a grant from the Improving Teacher Quality Program at the University of Georgia, the Math Collaborative has purchased Destiny Library Manager. Once it is installed and all of CRMC's library data has been updated, teachers will be able to browse the Collaborative's collection of books and materials via the Internet.

Destiny is the same library management program used in all Muscogee County Schools. In addition to allowing teachers access to our catalog of resources using our Web page, this new software will allow the Collaborative to better track usage by school systems and will make it easier to add new resources to our catalog. Teachers will be able to search for a particular resource or to search by topic, author, or publisher.

We believe this will be a great addition to the Collaborative. It should make it easier for teachers to use our resources. Muscogee County teachers will be able to search for a resource, find out if it is available, call the Collaborative, and have it sent to their school using Muscogee County's Pony Mail, which makes daily trips to CSU. The new program will also make it easier for teachers in outlying systems to find resources they need before they come to the Collaborative.

Watch for the on-line catalog on the Math Collaborative's web page at crmc.colstate.edu.

Professional Development

NCTM E-Workshops

Geometric Thinking in Grades 3-5, November 16 at 7:00 P.M. at CRMC (Follow-up on January 18 at 7:00 P.M.)
Problem Solving in Grades 3-5, November 30 at 4:00 P.M. at CRMC (Follow-up on January 11 at 4:00 P.M.)
Problem Solving in Grades 6-8, December 6 at 7:00 P.M. at CRMC (Follow-up January 17 at 7:00 P.M.)
Implementing the Algebra Standards is PK-2, January 30 at 7:00 P.M. at CRMC (Follow-up March 6 at 7:00 P.M.)
Geometric Thinking in Grades 9-12, February 1 at 7:00 P.M. at CRMC (Follow-up March 8 at 7:00 P.M.)

Building Bridges Half-Day Workshop, December 5, TBA
Building Bridges Winter Workshop, February 15, Turner Center, 8:30 A.M. - 3:30 P.M.
CRMC Spring Fling, March 8, TBA
NCTM Annual Meeting, March 21-24, Atlanta
Building Bridges Half-Day Workshop, April 26, TBA

CRMC to Host NCTM E-Workshops

The Collaborative will offer teachers the opportunity to participate in several NCTM E-Workshops during the year. The E-Workshops are presented by nationally recognized presenters and members of the NCTM staff, and are broadcast to local sites via the Internet and a phone connection. Participants at the local sites are able to interact with the presenters using the web connection and a speaker phone. Several teachers and CRMC staff members participated in a couple of these E-Workshops last year and found them to be informative. The workshops include an initial 90-minute session and one follow-up session. Participants in the workshops will receive an electronic copy of the workshop materials.

Geometric Thinking in Grades 3-5 will be presented by Amy Mirra, a former elementary school teacher and recent NCTM staff member, on November 16 at 7:00 P.M. The workshop will offer approaches and techniques for integrating geometric concepts in the classroom and provide activities for classroom implementation. The follow-up session will be held on January 18 at 7:00 P.M.

Problem Solving in Grades 3-5 will be presented by James M. Rubillo, a former high school teacher, community college teacher, leadership development consultant, and current Executive Director of NCTM. The workshop will be November 30 at 4:00 P.M. with the follow-up session on January 11 at 4:00 P.M. Teachers will have the opportunity to interact with several problems as they explore the problem solving expectations as defined in NCTM's *Principles and Standards for School Mathematics.* Mr. Rubillo will also present *Problem Solving in Grades 6-8* on December 6. This workshop will offer middle grades teachers approaches and techniques for integrating problem solving in the classroom and provide activities for classroom implementation. The follow-up session will be January 17 at 7:00 P.M.

Implementing the Algebra Standard in PK-2, presented by Emily Hendricks, will be offered on January 30 at 7:00 P.M. with follow-up on March 6 at 7:00 P.M. Emily has been an elementary school teacher and is currently the Professional Development Director and Curriculum Coach for her district. She is a past Presidential Awardee in Mathematics and was lead writer of Indiana's Math Curriculum Framework document. Teachers in the workshop will gain an overview of the NCTM algebra standards and will experience approaches for integrating algebra into the PK-2 classroom.

Geometric Thinking in Grades 9-12 will be presented by Fred Dillon, a high school math teacher in Strongsville, Ohio, and professional development consultant. He has served on NCTM's Professional Development Services Committee and is nationally certified in Adolescent and Young Adult Mathematics. This will be the final E-Workshop of the year and will be held on February 1 at 7:00 P.M. with a follow-up session on March 8 at 7:00 P.M. Teachers will experience ways to engage their students in learning geometry.

All of the workshops will be hosted in the CRMC offices in Jordan Hall and are free to teachers in CRMC member systems. Please contact the Collaborative for further details.

New Books

Good Questions For Math Teaching: Why Ask Them and What to Ask (K-6)
Thought-provoking questions can transform classrooms into dynamic learning environments. Open-ended questions prompt children to think creatively and critically. This book helps teachers define good questions, offers tips on how to create their own good questions, and includes a wide variety of questions for use in the classroom.

Classroom Discussions: Using Math Talk to Help Students Learn (1-6)
This book offers a unique look into the significant role that classroom discussions can play in teaching mathematics in grades 1-6. It's not enough to have a math class filled with conversation—what matters is the talk, skillfully guided by the teacher, results in deeper mathematical understanding for the students and clearer insight on the part of the teacher into what students comprehend and don't comprehend. This book shows teachers how they can become skillful facilitators for making classroom discussions the heart of their mathematics teaching and the key to their students' learning.

Mathematics Assessment Sampler: Items Aligned with NCTM's Principles and Standards (Pre-K-2, 3-5, 6-8, 9-12)
This series was designed to present samples of student assessment items aligned with NCTM's Principles and Standards for School Mathematics. The problems, which were designed as formative assessments, focus on students' conceptual knowledge as well as their procedural skills and are stuitable for use as benchmark assessments or as evaluations of how well students have met particular NCTM Standards and Expectations.

Thinking and Reasoning with Data and Chance: NCTM's Sixty-eighth Yearbook
This book focuses on students' and teachers' learning in statistics centered on a set of activities. Topics include the relation between mathematics and statistics, the development and enrichment of mathematical concepts through the use of statistics, and discussion of the research related to teaching and learning statistics.

Family Math Night: Math Standards in Action and Family Math Night: Middle School Math Standards in Action
These books provide activities, ready to use with parents and students at family math nights. This is a great resource for planning programs for your parents and helping them understand the types of learning activities students are doing in your classroom.

Columbus Regional
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