

Columbus State University Columbus Regional Mathematics Collaborative

CRMC News

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Everyone's A Winner With Mathematics

In the midst of all of the competition in the fall for winners and losers in the political arena and in football stadiums, the Columbus Regional Mathematics Collaborative held its Fall MathFest with the theme, "Everyone's a Winner with Mathematics."



Cheryl Keck, ETA/Cuisenaire representative, delivers keynote address at Fall MathFest

The annual event was held October 9 at the Elizabeth Bradley Turner Center at Columbus State University. Cheryl Keck, educational consultant with the ETA/Cuisenaire Company, was the keynote speaker for the evening. She delivered an inspiring address that encouraged teachers to "get off of dead horses" and move forward in the journey to inspire students to learn to use mathematics.

Following Cheryl's keynote presentation, local teachers and CSU students participated in grade level sessions led by area teachers. Holleigh Davis, Brewer Elementary, led the session for grades K-2 and presented activities related to data analysis and probability. Peter Masuoka, local businessman and father of Lakewood Elementary fifth grade teacher, Tomiko Masuoka, presented a 3-5 session on using origami in the classroom. He displayed numerous models he had made

that illustrated a variety of geometry concepts and showed teachers how to make several models that they could use in their classrooms. Linda Lenhard, Blackmon Road Middle School, presented the 6-8 session. Linda showed her students' algebra expression stories with an accompanying rubric, and her students made up their own expressions and wrote stories to explain the expressions. Amanda Merritt, Jordan High School, presented the high school session. She shared several probability activities that could be incorporated into high school classes, especially the new Math 1 class.

Approximately 60 area teachers, CSU students and faculty attended the event. They enjoyed a pizza buffet in the Turner Center's Founders Hall, which was decorated to look like a political rally. Although none of the major political candidates attended the rally, there was a brief appearance by past NCTM president and former CSU faculty member, Dr. Mary Lindquist, who was in town for a visit. Those who knew and had worked with Mary enjoyed the opportunity to visit with her for a few minutes, and she was glad to see so many people involved in a mathematics activity.



Past NCTM president, Mary Lindquist, visits with Ruby Tucker, CRMC volunteer

Fall MathFest is one of two annual evening dinner meetings that CRMC sponsors each year. The other is March Mathness, which will be Tuesday, March 3, 2009.

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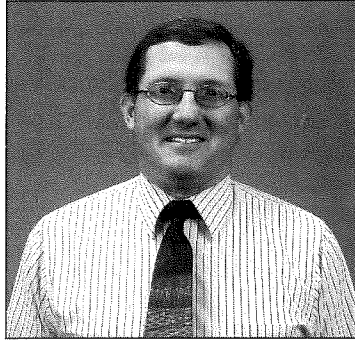
Director's Message

As Bob Dylan sang, "the times they are a changing." As we enter this new year change continues to happen all around us. Some we will embrace with elation and some we will run from and try to avoid at all costs. Because we are all different, you may run from those I embrace, and I may try to avoid those about which you are elated. But regardless of our wishes and desires, change will continue to come.

Charles Darwin reportedly once said, "It's not the strongest of the species that survives, nor the most intelligent that survives. It is the one that is the most adaptable to change." If we are going to navigate the sea of change in education, we must learn to adapt to those changes. One of the areas where we've seen significant changes in the past few years is with regard to accountability brought on by No Child Left Behind (NCLB). Because of the accountability measures of NCLB, pressures have increased to help students be successful on end-of-year tests that are used to determine whether schools make Annual Yearly Progress (AYP). How have these high stakes tests changed what goes on in our classrooms?

Are we still teaching a broad and rich curriculum as advocated by the National Council of Teachers of Mathematics' *Principals and Standards for School Mathematics* and the Georgia Performance Standards? Or have we narrowed the focus of our teaching to address only those portions of the standards that are assessed on the high stakes tests? As we begin the new year in our classrooms, it is important for us to remember that often, topics are selected for inclusion on end-of-year tests because they are easily tested in a multiple choice format. Many times those tests fail to adequately assess students' abilities to solve real open-ended problems, explain their reasoning, and communicate mathematics. Although these process skills may not be assessed when determining AYP, they are certainly important if one is to be truly mathematically literate.

Hopefully, there will be changes in NCLB in the coming year that will reduce the over emphasis on standardized testing in determining which schools, which teachers, and which students are making AYP. Until those changes come, it is important for us to



Kenneth Jones

remember that in education, change does not happen in isolation. Change doesn't have to be something that is done to us. It should be something that we are actively involved in. When change happens rapidly, as we have seen in education in the past few years and as we are now seeing in our political and economic worlds, there is a temptation to feel overwhelmed and to surrender and to just let things happen. As educators involved in teaching a generation that will one day run the world, we can't afford to surrender to the temptation to only teach those things that are easily accessible on a standardized test. We have to set our sights higher and try and

make sure our students have the skills they need to succeed on the test that is life. If our students can use and apply the mathematics we teach in real-world situations, they should possess the skills needed to do well on a standardized test. The converse, however, is not true—being able to do well on a standardized test may not be enough to do well even at the next grade level, much less later in life.

As you begin this new year, 2009, and encounter all of the changes it brings, don't let change just happen to you. Be a part of changing what happens around you for the better. The Chinese philosopher, Lao Tzu, once said, "If you do not change direction, you may end up where you are heading." Remember, you are the captain of your classroom. It is your decisions that will determine where your students end up. Don't be afraid to make adjustments and modify your direction. The National Council of Teachers of Mathematics and the Georgia Performance Standards have mapped out a desirable destination for all of our students. It's not an easy destination to take them to and it's not one that we are all comfortable with. It is however, I believe, a change in the right direction. Let's not miss the glory of witnessing our final destination by getting sidetracked by focusing only on what is easily tested.

Change is not easy—it's just inevitable. One of the main reasons the Columbus Regional Mathematics Collaborative is here is to help teachers navigate the sea of change in mathematics education. Don't travel alone. Call on us and utilize our resources. Together we will adapt and change.

Manipulative Activities for Modeling Multiplication and Division

Elementary Teachers, if you haven't used base-ten blocks lately, consider dusting them off and seeing how well they fit within the third- through fifth-grade GPS. Often used in the early elementary grades to teach place value, most elementary schools have this valuable manipulative. In October, Linda Hayes, Hope Phillips, and Ruby Tucker conducted a workshop at Park Elementary based on Unit Two of the GPS Frameworks, which focuses on multiplication and division, including decimals in the fifth grade. Base ten blocks provide a conceptual model for both multiplication and division, with a foundation of place value. They may also be used to model multiplication of decimals to the tenths place.

Often, teachers are concerned about students' abilities to move successfully from using manipulatives to paper-and-pencil work. CRMC resource teachers have developed multiple strategies for addressing this important issue. If you are interested in learning how to utilize base-ten blocks in your classroom, contact Hope Phillips.

CRMC Hosts Visit for Special Education Students

Students from Blackmon Road and Marshall middle schools visited CSU's campus on Friday, November 7, and students from Veterans Memorial Middle School visited on Friday, November 14, to participate in lessons taught by CRMC staff, CSU faculty, and CSU students. This was the second year for special education teachers Jeff Peoples, Carolyn Shafer, and Michelle Lowe to bring their students on a field trip to CSU to participate in math lessons. The students participated in hands-on activities that involved absolute value, equivalent fractions, decimals, and percents, characteristics of cylinders and cones, recognizing congruent figures, making tree diagrams, finding square roots of perfect squares, and making frequency distributions for a probability simulation. Many CSU students who were recruited by their instructors or by Lisa Shaw, Director of the SAFE Office, helped provide individual attention to the middle school students by helping to lead the lessons. For some CSU students this was a service opportunity and for others it helped fulfill course requirements for working with or observing special education students.

The middle school students were enthusiastic about the opportunity to visit CSU and to work with the faculty members and student volunteers. The regular classroom teachers benefitted from the experience because they discovered new lessons and materials that they could use to continue to work with their students. CSU students and faculty gained a better appreciation for the challenges and rewards of working with students with special needs. Dr. Greg Blalock, one of CSU's new Assistant Professors who teaches special education courses, participated in both days of lessons. He hopes to be able to work with CRMC and the schools next year to incorporate this experience into one of his courses so that students can participate, not only in teaching, but also in planning and developing the lessons.



CSU student volunteers work with special education students on math lesson activities

Seeking Funding for New Projects

CRMC recently submitted three proposals to fund elementary, middle school, and high school projects during the 2009-10 school year. The proposals were submitted to the Improving Teacher Quality Higher Education Program administered by the University of Georgia. If funded, the projects would begin with our summer workshops this June.

Connecting and Applying Math for Life is a project for elementary teachers to help improve their mathematics content knowledge and pedagogy and to help them make real world connections to mathematics for their students. The project consists of a summer workshop with extended follow-up and support throughout the school year. A proposed special project involves helping students make mathematical connections to their school and community through the creation of local math trails.

Modeling in Middle Grades Mathematics (M²GM) would provide professional development to middle grades teachers through a two week summer workshop, a practicum teaching experience, and participation in the development of a database of performance tasks. Participants would be exposed to modeling pedagogy, use of the graphing calculator, and experiments and hands-on explorations linked to the middle school GPS. During the year participants would develop additional performance tasks that would be piloted in their classrooms. The performance tasks and sample student work

and rubrics would be made available through the CRMC website.

Helping Teachers Help Students with Just-in-time Delivery would expand our current high school project to include Math 2. A summer workshop would provide opportunities for teachers to delve deeper into the mathematics content in the new course and explore additional activities and tasks that could be included in the Math 2 course. The project would allow CRMC to offer just-in-time planning sessions for Math 2 teachers during next year similar to those that Math 1 teachers have been involved in this year.

A special feature of all of the projects is the inclusion of a component to look at differentiating instruction for students with special needs. Each of the proposed projects includes involving special education faculty from CSU to help participants identify ways to modify instruction to meet the needs of diverse learners.

You can view summaries of the proposed projects on the *Other Resources* page of our website. CRMC should receive word by early March whether the projects are funded. Watch your mail and email for additional information. More information about the projects will be available in our Spring newsletter.

Teacher Quality Grant Helps Teachers Open Doors to Student Understanding

Teachers at Dimon Magnet Academy in Muscogee County and Park Elementary and New Mountain Hill Elementary in Harris County are participating in the school year portion of the Collaborative's 2008-09 Teacher Quality grant, *Process Standards Open the Door*. The project seeks to develop teachers' mathematics knowledge; promotes the use of the process standards of problem solving, reasoning, representation, connections and communication as integral parts of instruction; and seeks to develop teachers' abilities to assess student learning using alternative forms of assessment. Teachers at these three sites are engaged in ongoing work during the school year that involves exploring student work and examining student thinking using a set of common grade level assessments.

CRMC resource teachers meet with faculties at the schools bi-monthly to share an assessment task for each grade level. At these meetings, teachers work through the tasks, examine their own thinking about the problems, and discuss how they think their students might respond to the problems. Teachers then present the problems to their students and collect student work samples. Once all the teachers have used the tasks in their classrooms, the CRMC resource teachers return to the schools and meet with the teachers to explore the student work samples and examine student thinking—especially in relation to the process standards. Teachers discuss ways to use the results of the assessment to make decisions about the next steps in instruction. Each school will participate in three assessment cycles during the year. Teachers who are participating in the project will receive PLU credit.

In addition to the regular meetings at their own schools, teachers participate in two all-day workshops during the year. The first workshop was held on November 13 at CSU's Cunningham Center. Teachers attending the workshop explored a variety of algebra, geometry, and data analysis activities that they could do in their classrooms. Fourth and fifth grade teachers also explored the Singapore method for drawing pictures to help solve a variety of mathematics problems. Teachers continued their exploration of rubrics and alternative assessments by looking at several ways that rubrics could be used to help distinguish levels of student performance on the types of open-ended assessment task they are working to implement in their classes.

The school sites participating in this project were selected based on the significant numbers of their teachers who participated in CRMC's June workshop. This workshop, attended by 33 area teachers, was designed to help improve teachers' mathematics knowledge and to help them better implement the mathematics process standards in their classrooms. Teachers in the workshop engaged in activities from the NCTM publications, *Navigating through Algebra*, *Navigating through Geometry*, and *Navigating through Data Analysis and Probability*. Teachers engaged in the content and process standards as they engaged in the activities. Elementary teachers met daily with middle grades and high school teachers to explore the use of alternative assessments in their classrooms. The grade appropriate volume of NCTM's *Mathematics Assessment Sampler* served as the text for this portion of the workshop. Teachers received copies of all the books used in the workshop.

Did You Know?

Did you know that in...

1489 Johann Winmann first introduced the + and – symbols?

1491 Filippo Calandri introduced the long division algorithm we use today?

1525 Christoff Rudolff introduced the square root symbol?

1557 Robert Recorde first used the = symbol?

1583 Christopher Clavins used a dot for multiplication?

1613 William Oughtred used the symbol X for multiplication?

Teachers Learn New Strategies at Fall Workshop

Over fifty teachers from around the area attended CRMC's Fall Workshop on October 21. Teachers participated in grade band sessions led by CRMC staff members, all centered around the theme, *Engaging Students Through Hands-on Learning*. The day-long workshop was held at CSU's Elizabeth Bradley Turner Center.

Teachers in grades K-5 began the day by exploring a variety of problem solving activities led by resource teachers Cynthia Hill and Shannon Lewis. During the second morning session the K-2 teachers participated in games that promote mathematical thinking and problem solving. Participants used dice, cards, and various other materials to explore mathematical concepts through playing games. Kenneth Jones helped teachers in grades 3-5 explore ways to help their students understand fraction concepts, especially adding, subtracting, and multiplying fractions by drawing pictures and using fraction squares. Teachers were excited to have a different visual method to present fraction operations to their students. During the afternoon session, elementary teachers estimated, gathered, organized, and summarized data on the number of raisins in a box. They created a tally chart and a line plot, used to analyze data and make a recommendation on which type of raisins to purchase.

During the morning, CRMC resource teacher Hope Phillips worked with middle school teachers from Muscogee County, Phenix City, St. Luke, and Our Lady of Lourdes schools. Participants learned to use pattern blocks and two-color counters to help their students solve two-step equations. Pattern blocks enable students to more easily work with equations having fractional coefficients. The teachers also explored area and perimeter concepts on using geoboards. After lunch, Kenneth worked with the teachers to explore several problems that made connections between data analysis, probability and other concepts.

CRMC resource teacher Linda Hayes worked with the high school teachers throughout the day. Teachers worked on numerous hands-on activities. In Algebra they explored functions: linear, quadratic, and exponential using manipulatives and hand-held technology. In Geometry they explored the Pythagorean Theorem, the triangle inequality, quadrilateral properties and networks. Again, each activity involved the use of hands-on materials: toothpicks, spaghetti, geoboards, pennies, graph paper, string, polygon cut-outs, graphing calculators, and even bugs and spiders!

Upcoming CRMC Events

Process Standards Open the Door Follow-up workshop – February 19, 8:30-3:30, Elizabeth Bradley Turner Center

This workshop is for teachers who attended the original Process Standards workshop in June and for teachers at Dimon, Park, and New Mountain Hill Elementary Schools who are involved in our special school year project involving looking at student work.

Supporting the Standards with Just-in-time Delivery Follow-up workshop – February 19, 8:30-3:30, Elizabeth Bradley Turner Center

This workshop is for teachers who attended the original Supporting the Standards workshop in June and for Math 1 teachers from schools involved in our Just-in-time Delivery project.

March Mathness – March 3, 5:30-8:00, Cunningham Center

This is CRMC's annual spring evening dinner meeting with a keynote speaker and grade level sessions led by area teachers. The cost for the evening event is \$10.

Spring Workshop – Empowering Students Through Games, Technology, and Hands-on Activities – March 4, 9:00-3:00, Cunningham Center

This is a free workshop for teachers in CRMC's member systems. K-2, 3-5, 6-8, and 9-12 grade band groups will explore ways to engage and empower students through a variety of games, technology explorations, and hands-on activities.

CRMC Involved in Work with Parents

CRMC staff members have been busy during the fall helping schools in the area with math events for parents. Elementary resource teachers presented at several family math nights in Muscogee County. Tracy Belt, the 21st Century coordinator for MCSD, arranged parent/family math nights throughout the county to help parents develop a better understanding of the Georgia Performance Standards. Elementary resource teachers Cynthia Hill and Shannon Lewis introduced parents to several games using cards and dice that can easily be implemented at home with little cost. They presented activities at math nights for Lonnie Jackson Academy, Matthews Elementary, and Muscogee Elementary during the fall and are scheduled to present at Georgetown, South Columbus, and St. Mary's elementary schools in January.

Faculty from Fort Middle School visited CRMC in November to meet with staff members Kenneth Jones and Hope Phillips to discuss ideas for activities for teachers to use during their family math/science night held later that month. Although no one from CRMC was available the night of the event to present, several faculty from CSU's College of Science provided science demonstrations.

Kenneth Jones shared a variety of games for reinforcing basic skills and problem solving to parents and their children

at a family "Lunch and Learn" at Wesley Heights Elementary on November 17. Approximately twenty parents and grandparents attended the event. Their students joined them for lunch and participated with them in the activities. This was the first time Wesley Heights had included students in the lunch and learn session.

Students and parents always get excited about doing mathematics when they encounter the mathematics in games and hands-on activities. Contact the Collaborative for assistance in planning a family math night for your school.



Student enjoys Lunch and Learn at Wesley Heights Elementary School

CRMC Hosts E-workshops

Area teachers, CSU faculty and CSU students participated in a variety of electronic professional development activities hosted by the Collaborative during the fall. Several of the events involved hosting the broadcast of web conferences. *Beyond Slices of Pizza: Teaching Fractions Effectively* was the title of a web conference presented by the Center for Comprehensive School Reform and Improvement. Several CSU faculty members and students attended the webcast along with a couple of area teachers. An archive is available at www.centerforcsri.org/webcasts/fractions/. CRMC also hosted the Phi Delta Kappa web presentation of the results of the 40th Annual PDK/Gallup Poll of the Public's Attitudes Toward the Public Schools. Information about the PDK/Gallup Poll is available at www.pdkintl.org/kappan/kpollpdf.htm.

NCTM E-workshops have been a popular offering at CRMC for the past couple of years. Thanks to a large group of students from Dr. Richard Stevens' classes, a capacity crowd attended the workshop for *Reasoning with Data and Probability in Grades 3-5* on October 22. Participants received an overview of the NCTM data analysis and probability standards, participated in several online data explorations, and were introduced to a number of interactive online applets that could be used in their classrooms. A smaller crowd returned on December 3 for a follow-up workshop. This year NCTM offered their popular New Teacher workshop in the E-workshop format. The workshop provided information on topics such as classroom management, motivation, and meeting the needs of diverse learners for new and pre-service teachers. Teachers were also introduced to mathematics activities they could use in their classrooms during these three-hour workshops. A session for K-6 teachers was held on November 4 and a session for 6-12 teachers was held on November 12.

The NCTM E-workshop, *What Does it Mean to be Ready for Algebra (Grades 6-8)* was presented on January 26, from 4:00-5:30. The workshop covered the distributive property, proportionality, and why and how mastery of these concepts will help students with algebra. A follow-up session will be held at the same time on March 16. *Math Games for the Classroom in Grades 6-8* was held on January 28, from 4:00-5:30 PM. A variety of games for teaching and reinforcing number and operations were explored. A follow-up session will be held on March 18. The follow-up session will focus on games that encourage problem solving skills. These workshops are free to teachers from CRMC member systems. Sign up by clicking on the registration link at <http://crmc.colstate.edu>.

Teacher Quality Project Supports Math 1 Teachers

The Columbus Regional Mathematics Collaborative is conducting a project this year to help teachers with the implementation of the new Mathematics 1 curriculum. The project, *Supporting the Standards with Just-in-time Delivery*, is funded through a grant from the Improving Teacher Quality Program at the University of Georgia.

The project, designed to assist teachers make the transition to the new Georgia Performance Standards Mathematics 1 curriculum, began with a week-long workshop for teachers, held June 9-13, 2008. During the workshop, fifteen teachers from Muscogee, Harris, and Troup counties had an opportunity to explore, in depth, topics from the new Math 1 course. Teachers focused particularly on function concepts as they explored the Transform App on the graphing calculator, geometry concepts as they worked with patty paper, and probability as they conducted probability simulations. Participants in the workshop received copies of three books that provide additional activities for use in Math 1—*Transforming Functions* from Texas Instruments, *Exploring Geometry with Patty Paper*, and *Probability Simulations*, both Key Curriculum publications. Workshop participants met daily with teachers in the elementary and middle school workshops to explore using alternative forms of assessment in their classes. Participants received the NCTM publication, *Mathematics Assessment Sampler: Grades 9-12*, to use as a resource for developing

alternative assessments.

A group of teacher leaders, selected from the summer workshop participants, compose a Just-in-time Delivery group and includes teachers from Jordan, Spencer and Kendrick high schools and the Teenage Parenting Center in Muscogee County; Harris County High School; Troup County High School; and Central High School in Talbot County. The group has been meeting regularly this fall to cooperatively plan tasks, instructional activities, and assessments for each upcoming Math 1 Unit. They have explored tasks from the Frameworks, from materials that they received at the summer workshop, from NCTM tasks found on the website, and from a variety of tasks they each submitted. Each teacher then returned to their respective schools to share this information with other Math 1 teachers.

As well as planning tasks, the teachers shared their experiences with the tasks from the Frameworks. Participants report that these meetings have been very helpful in providing the support needed as they implement this new and, in many ways, challenging curriculum. The Just-in-time sessions have given them the opportunity to share ideas about implementing the tasks such as:

- * how to introduce them,
- * when to work as an entire class and when to work in groups,
- * ways to alter the tasks to fit their students,
- * management techniques that they've implemented, and
- * assessment.

Additional Just-in-time meetings will be held on January 15 (Unit 5 Planning) and on February 19 (Unit 6 Planning). The teachers will meet from 9:00a-3:00p in CRMC's offices in Jordan Hall. Funds from the Teacher Quality grant will help reimburse schools for substitutes.

Additional support for Math 1 teachers is provided through two day-long follow-up workshops held during the year. The first follow-up workshop was held on November 13 at CSU's Cunningham Center. The next follow-up workshop will be February 19, 8:30a – 3:30p, at CSU's Turner Center. This workshop is open to teachers who attended the summer workshop and to any other teachers currently teaching Math 1.

CRMC staff is in the process of submitting a grant application for a similar project to provide extensive support for the implementation of Math 2 next year and to provide continuing support to Math 1 teachers. Contact Kenneth Jones at the Collaborative if you are interesting in learning more about how you can be involved in this project.



Just in time delivery participants transform a function



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Web Links

Interactive Math Glossary – This interactive glossary for students in K-6 provides a database of math terms along with illustrations and animated examples.

www.hbschool.com/glossary/math2/index.html

Activities for parents to engage young children – This site gives parents easy to use activities that they can use to help engage young children in beginning math concepts. www.talkaboutmath.org

What Works Clearinghouse – This site provides a link to the recently released publication *Turning Around Chronically Low-Performing Schools*. The guide identifies practices that can help improve school performance. Several other useful guides are also available on the site including *Organizing Instruction and Study to Improve Student Learning* and *Encouraging Girls in Math and Science*.

http://ies.ed.gov/ncee/wwc/publications/practiceguides/#turning_pg

Financial Literacy Materials – This site provides activities to help students in grades 4-6 learn about the importance of saving and responsible spending. The site contains information and activities that teachers can incorporate into mathematics and an interactive game for students. www.FeedthePig.org/Tweens

The Futures Channel – This site provides a library of free online movies and related lesson plans that make mathematical connections to different careers and real-world applications. www.thefutureschannel.com

GPS tasks for grades 6, 7, 8 and Math 1 – This site provides links to performance tasks and activities developed and compiled by Kennesaw State University that match the Georgia Performance Standards. <http://math.kennesaw.edu/mathed/NMMC>

Math Games for Basic Facts – This site provides a variety of different computer games at various levels to help students learn and practice basic facts.

www.aplusmath.com