



Math Collaborative Hosts Joint Workshop

On February 9th over eighty teachers in grades K-12 participated in the Math Collaborative's Joint Workshop held on the CSU campus at the Elizabeth Bradley Turner Center for Continuing Education. Teachers across all grade levels began the day by working on a problem designed both to promote teachers' algebraic thinking and to exemplify various algebraic habits of mind in its solution. In the *Golden Apples* problem, a prince encounters three trolls in succession who each demand half of his apples plus two more. Teachers were asked to find how many apples he started with if he had two apples remaining when he arrived home. They were then asked to find further generalizations if the number of apples he arrived home with varied. Participants found a variety of approaches that could be used for solving the problem, including using manipulatives and acting out the problem, building tables, trial and error, working backwards, developing function rules, and writing and solving symbolic algebraic equations. Teachers said they enjoyed seeing the variety of approaches



Linda Lenhard, Blackmon Road Middle, Amy Moxley, East Columbus Magnet Academy and Hope Phillips, CRMC Middle Grades Resource Teacher, discuss Algebraic Thinking.

that could be used by students to solve this problem. Many indicated that they couldn't wait to try the problem with the students in their classrooms.

Following the opening session, teachers divided into grade level groups, led by CRMC resource teachers, in which they engaged in activities tied to specific objectives

of the Algebraic Thinking grants. Elementary teachers participated in activities connecting children's literature to algebraic thinking.

One of the problems that teachers really enjoyed was the *Valentine Exchange* problem which resource teachers Cynthia Hill, Kimberly Voltz and Shannon Lewis used to engage teachers in algebraic thinking and looking for patterns.



Elementary teachers work on valentine project.

Hope Phillips worked with the middle grades teachers on a problem involving building staircases. Teachers used manipulatives and built tables in order to find various representations for the number of squares needed to build successive staircases. Kenneth Jones, CRMC Director, worked with the high school teachers on using Algeblocks® to help students build conceptual understanding of various algebra concepts.

Daniel Morgan from Lakeshore Learning assisted the CRMC resource teachers in presenting to the elementary teachers during the afternoon session. A variety of manipulatives and resources for elementary students were demonstrated for the participants. Teachers were especially excited when Mr. Morgan and Lakeshore gave away several kits and resources. Dr. Wendy Sanchez from Kennesaw State University worked with the middle grades teachers on a variety of open-ended problems. Dr. Sanchez has done a great deal of work in the Kennesaw area on using open-ended problems in teaching and assessment. Kenneth Jones led the high school teachers in exploring quadratic functions using the graphing calculator and the Texas Instruments Navigator system.

This workshop was one of two held each year as part of the Algebraic Thinking projects funded through the University of Georgia's Teacher Quality program.

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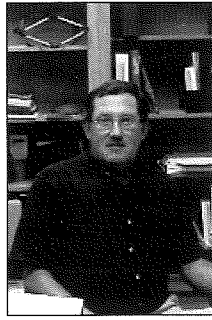
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THOUGHTS FROM THE DIRECTOR

It is hard to believe that another school year is almost over. I have enjoyed the experiences I've had during my inaugural year as Director of the Math Collaborative. The support I have received from the outstanding CRMC staff, CSU faculty and staff, and area teachers and administrators has been invaluable to me as I've worked to become familiar with the various aspects of this job. The quiet times of last July are a distant memory. Once school started things quickly got busy with workshop planning, presentations to teachers and students, grant writing, staff meetings, university faculty meetings, and the multitude of tasks associated with being director.



Kenneth Jones

I hope that my efforts have paid off for you. Hopefully, through your participation in some of our events this year you have gotten a new teaching idea or lesson, have tried something new, or have just been rejuvenated by participating in mathematics professional development with other teachers. If you still feel the need for additional professional growth—and I hope everyone does—please consider attending one of our summer workshops or teaching in one of our summer camps. My first experience with the Math Collaborative was about fifteen years ago as I attended one of the early workshops sponsored by the Collaborative. The following year, I had the opportunity to be one of the teachers during the first year of Prep PRIME, the high school camp. The opportunity to work with other outstanding teachers in that environment and to try out new lessons gave me the confidence to go back and try new things in my own classroom. I know that other teachers have had similar experiences

with working in camp. The \$400 you earn for teaching in the camp is not as much as you could earn with other summer jobs; however, it is an experience that I think you will find rewarding in itself. I hope that many of you will take advantage of this opportunity to develop as teacher leaders.

Thank you to everyone who has helped me make the transition from the classroom to the Collaborative. I look forward to an exciting summer of professional development and even more activities for next year. I value the input of teachers and administrators as we plan our programs here at the Collaborative. Anytime you have ideas or suggestions, please don't hesitate to share them with me.

Enjoy the remainder of the school year as you continue to engage students in the study of mathematics. I hope to see you at our summer workshops and camps and wish for you a well-deserved restful summer.

Mathematics and Mardi Gras: Let The Good Times Roll

Area teachers and preservice teachers from Columbus State University and Auburn University celebrated Mardi Gras on February 28th by attending Spring Fling, co-sponsored by the Math Collaborative and the Chattahoochee Council of Teachers of Mathematics. The event was held at Allen Elementary School in Columbus, where participants enjoyed a genuine New Orleans feast of red beans and rice, chicken gumbo, and bread pudding catered by Erin McLemore from Northside High School.

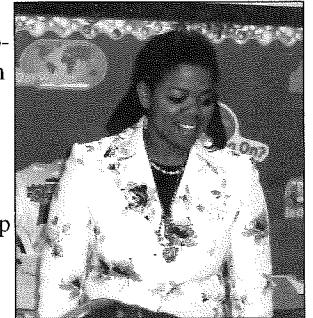
Dr. Michael Lacey, Georgia Institute of Technology, presented an entertaining and informative presentation on *John Conway's*

Tangles. John Conway was a famous mathematician who as a teenager discovered a method for describing tangles in string using rational numbers. Dr. Lacey demonstrated a method for creating unique tangles in two ropes using addition and negative inverses of rational numbers. The tangles were solved (untangled) using repeated operations to produce an integer which denoted the number of exchanges that needed to be made to untangle the two ropes.

Following the dinner and keynote presentation, teachers participated in grade level sessions. Stephanie Dalton and Stephanie Golden of Eastway Elementary in Muscogee County led the elementary session. Their topic was *Throw me some beads, mister!* Teachers made strings of Mardi Gras beads and sorted them according to various characteristics, formed different patterns with the colors, and discussed methods of expressing fractions using the beads. The teachers enjoyed the activities as well as the numerous suggestions for classroom management shared by these two presenters.

Amy Moxley from East Columbus Magnet Academy, also in Muscogee County, led the middle school session. She shared several activities from the book *Box Cars and One-eyed Jacks*

relating to probability, problem solving, and computation practice. Peter Anderson, a teacher at Troup County High School, led the high school session. Using the topic *The Princess and the Magic Bottle*, he shared a variety of activities that he uses in his classroom to engage students in learning mathematics.



Stephanie Golden, Eastway Elementary, watches as elementary participants work on the bead problem.



Elementary teachers count beads at Spring Fling.



Michael Lacey leads teachers through Conway's Tangles.

National Teacher Of The Year Visits CSU

Jason Kamras, the 2005 National Teacher of the Year, visited Columbus February 21-22. Mr. Kamras is a mathematics teacher at John Phillip Sousa Middle School in Washington, D.C. During his Columbus visit he spoke at a breakfast for Muscogee County Teachers of the Year, at a dinner meeting of the Columbus Chapter of Phi Delta Kappa, at a luncheon meeting for Fort Benning teachers, at a breakfast for Columbus State preservice teachers, and to a gathering of CSU faculty, staff, students, and a group of students from Hardaway High School.

The theme of Mr. Kamras' talks was the need for greater equity for all students in American education. He teaches in a system where ninety percent of the students fall below the poverty line, which is an income of \$19,500 for a family of four. In the shadows of buildings and monuments in Washington that proclaim "liberty and justice for all," he teaches children from some of America's poorest families in woefully

inadequate facilities. In spite of these obstacles, Mr. Kamras spoke of the successes his school has achieved in reducing the number of students who scored below grade level in mathematics—from 80% one year to 40% the next. One thing the school implemented was to increase the amount of time students spend in mathematics. However, Mr. Kamras attributed the greatest success to these facts: 1) all the teachers have high expectations for all the students and 2) the teachers have developed a sense of personal responsibility for the success of their students. According to Mr. Kamras, although high expectations is a common theme in education today, "still many children languish in classrooms where the bar is so low that the expectations do not prepare them to be well educated."

Mr. Kamras said that he enjoys the challenges of teaching, especially teaching mathematics. He said, "I like taking complex things and finding a way to break them down and then make it interesting." He has



Jason Kamras, National Teacher of The Year

used photography as a tool for teaching mathematics. Some of his students' work can be seen at www.exposeprogram.org.

CRMC Conducts Hands-On Workshops For MSCD Middle Grades Teachers

Muscogee County middle grades teachers participated in training on integrating manipulatives, graphing calculators, and other hands-on activities into the classroom. The training was conducted by Kenneth Jones, Director, and Hope Phillips, Middle Grades Resource Teacher.

Sixth-grade teachers attended six hours of training on January 19; seventh- and eighth-grade teachers attended three hours each on January 23. Approximately forty mathematics and special education teachers attended each session. Participants worked together to learn to use a variety of manipulatives included in the kits that all middle schools recently received from the State. Activities were selected

based on the content of the new Georgia Performance Standards. Sixth-grade teachers learned to use pattern blocks as models for addition, subtraction, multiplication, and division of fractions. Seventh- and eighth-grade teachers focused on the use of the Algeblocks® kits. Teachers were also introduced to several uses of graphing calculators in classroom investigations.

Follow-up sessions were held after school on February 2, March 2 and March 14. Teachers participating in the follow-up sessions are eligible to earn one PLU.

CRMC Develops Listservers To Promote Teacher Sharing

Three listservers have been established to facilitate sharing of ideas and discussion of mathematics education among area teachers, CRMC staff, and CSU mathematics and education faculty members. A listserver allows participants to subscribe to a list and then participate in ongoing discussions about relevant topics via their regular e-mail accounts. Members can choose their level of participation—some may choose only to read messages posted while others may choose to make regular comments to the list.

The lists are crmc-es (elementary), crmc-ms (middle school), and crmc-hs (high school). To subscribe to one of the lists, send an e-mail to majordomo@lists.colstate.edu with either "subscribe crmc-es", "subscribe crmc-ms", or "subscribe crmc-hs" in the body

of the e-mail message. For your protection these are closed lists, which means the list administrator at the Collaborative will have to grant approval before your registration is complete. If you decide at any time that you no longer wish to participate in the list, you may send a message to the above address with "unsubscribe *listname*" in the body of the message.

The lists will make it possible for lesson ideas to be easily shared among teachers throughout the Collaborative's service area. Teachers will be able to post questions related to mathematical content, pedagogy, classroom management, assessment, or any concern related to the teaching of mathematics. Any member of the list will be able to respond to teachers' postings. Subscribe to your grade level list and join the discussion today.

Shannon Lewis Joins CRMC Staff

The Math Collaborative is glad to welcome a new addition to our staff, Shannon Lewis, who has joined us as an elementary resource teacher. Shannon attended the University of Georgia as an undergraduate, received a Masters of Education at Columbus State University, and earned a Specialist in Education at Troy State



Shannon Lewis

University. She taught at Georgetown Elementary School before taking time off to be with her children.

While teaching first grade at Georgetown, Shannon says that she always enjoyed planning the math lessons because she liked the various techniques using manipulatives. Using the manipulatives, she says, helped her students to better understand the mathematical concepts that she was teaching. Not only was the hour spent in math stations a favorite with her, it was also a favorite with her students.

According to Shannon, "I am thrilled to have the opportunity to be a part of the Math Collaborative. As a new resource teacher... I feel privileged to serve teachers and students in our area to help develop a better foundation for mathematics."

We hope this is the beginning of a long relationship! If Shannon can be of assistance to you or your school, e-mail her at lewis_shannon@colstate.edu or call our office at 706-568-2480.

Middle School Summer Workshops Coming Soon

If you haven't had a chance to participate in one of the CRMC-sponsored events this year, it's not too late. The middle school summer workshop and camps (PRIME and POWER) are coming soon. In an effort to best meet your needs, each day of the workshop will focus on a different strand of the Georgia Performance Standards (GPS). We will have an algebra day, a geometry day, etc. The source for many of the activities will be the National Science Foundation-supported curricula for middle school. We introduced these in the workshop last summer. These curricula provide rich, ready-made problems that fit nicely with the

GPS. Workshop participants will work together to develop performance tasks for each strand, with the help of published curricula and our own ingenuity.

With the theme The Sights and Sounds of Mathematics, PRIME and POWER camps will link the arts and mathematics to enable students to experience mathematics from a different perspective than school. Guest speakers will provide authentic models of how art and mathematics coalesce, and daily work on crafts will enhance students' understanding of varied uses of mathematics.

Opportunities To Be A Leader In Math Education

Do you want to become a leader in mathematics education? Are you willing to volunteer to help other mathematics teachers? Mathematics teachers in the Chattahoochee Valley area have several opportunities to be leaders. If you are not already a member of the Chattahoochee Council of Teachers of Mathematics, please consider joining this local affiliate of the National Council of Teachers of Mathematics. The local president is Lynn Perkins who teaches at Northside High School. She can be reached by e-mail at LynnPerkinsCCTM@aol.com. The next meeting is May 4th from 4:45 p.m. until 6:45 p.m. at a location to be determined. You are invited to come and to bring an activity to share with other teachers.

You can communicate with other mathematics teachers online

by joining the CCTM Internet Classroom on Nicenet.org. Go to Nicenet.org and register as a new student using the class key 6Z35499C88.

You can help provide service to the National Council of Teachers of Mathematics by volunteering to help with the 2007 Annual Meeting and Exposition in Atlanta, March 21-24, 2007. Cathy Franklin, at Columbus High School, is coordinating local volunteers. You can download the volunteer form at www.nctm.org or send an e-mail to atlantavolunteer@nctm.org or contact Cathy at Columbus High (706-748-2534). Volunteers are needed to help place signs outside meeting rooms, assist in the Press Room and hand out the on-site conference newspaper, and to host and assist in the Cyber Café.

An Interesting Solution to a Problem

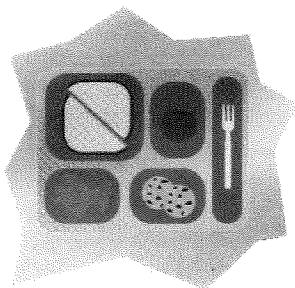
The following problem was posed to Mr. Jason Kamras' students during a review for their state assessment.

"A store sells small T-shirts for \$10 each, medium T-shirts for \$15 each, and large T-shirts for \$20. List at least three ways that you can spend exactly \$50 and not get any change."

Otis, a very bright and witty student, gave this answer.

"You could buy five small T-shirts for \$10 each, or you could buy two mediums for \$15 each and a large for \$20, or Mr. Kamras, you could buy three smalls for \$10 each, a medium for \$15 and tell the clerk to keep the change."

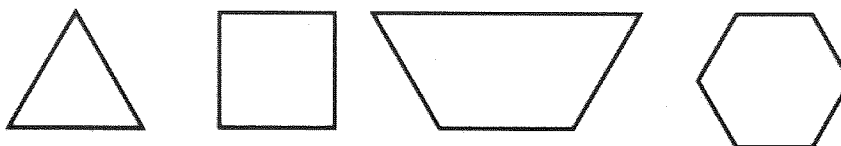
Otis got an A!



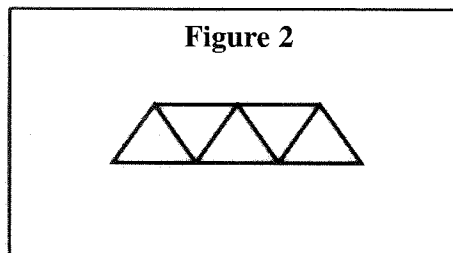
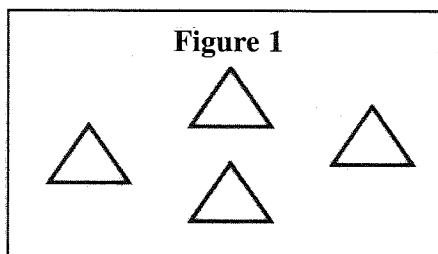
Algebraic Thinking

New Tables for the Cafeteria

Your school cafeteria manager is considering buying new tables for your cafeteria. The tables come in the shapes of the pattern blocks shown below. One person can sit at each side of a table except with the trapezoid table where two people can sit on the longer side.



The cafeteria manager needs your help in determining the number of tables needed to seat different numbers of students. Two different arrangements of the tables are possible. Restaurant style means that each table is individual as shown in Figure 1. Banquet style means the tables are arranged in a long row as shown in Figure 2.



Your task is to build a table of values for each type of table and table arrangement that shows the number of students that can be seated at each type of table and to develop a rule that the cafeteria manager can use that will tell the number of people that can be seated if the number of tables is given.

Table Shape:		
Number of Tables	Restaurant Style	Banquet Style
1		
2		
3		
4		
5		
6		
.		
20		
N		

Recommended By CRMC Staff

A+ Compass – Kenneth found this at the NCTM Regional Conference in Birmingham. It is a compass designed for use either with chalk on the chalkboard or with markers on a dry erase board. It will hold any size marker, pen or pencil and is useful for doing large constructions on paper as well. According to Kenneth, “It doesn’t slip like many of the large board compasses I’ve tried and it works equally well on a chalkboard or dry erase board and it’s durable.” They also have a smaller version available now for use on the overhead projector. You can see this product and order it at www.apluscompass.com.

Problem Solving Websites – An excellent source of intriguing and challenging problems for grades K-12 can be found at www.olemiss.edu/mathed/contest. The problems are divided by grade level and subject matter. The contest is not active but the past problems provide a wealth of challenges for your students. A current problem of the week contest is active at www.umassd.edu/mathcontest. Weekly problems are posted on the site and students who e-mail correct solutions are recognized on the site. Past problems are also available on this site. Another weekly problem of the week contest is available at www.whitehouse.gov/kids/math. The problems change every week.

Mathematics on Television – In the CBS television show *NUMB3RS*, an FBI agent turns to his brother who is a mathematician for help in solving crimes. The show airs on Friday nights at 10:00 Eastern time. Student activities that relate to each show, as

well as background information about the show, can be found at www.cbs.com/numbers. The NBC show *Deal or No Deal*, which airs on Monday and Friday nights, provides an interesting scenario for investigating probability. Contestants choose one of 26 briefcases, each holding an amount of money between \$0.01 and \$1,000,000. They then have the opportunity to open remaining briefcases to find out what is not in theirs. At various points during the game a banker offers to buy their briefcase. An interactive version of the game can be found at www.nbc.com/deal_or_no_deal. The game could be used to generate a lively classroom discussion of probabilities and expected values.

Interactive Websites – Visit www.mathplayground.com for a variety of interactive activities geared mostly toward K-12 mathematics. Most activities are geared toward elementary and middle school students but high school students will enjoy the logic games and the SAT review information. This site contains a variety of interactive practice activities and games. The Function Machine would be great for whole class instruction. The Math TV lessons could be used to introduce content or for students to learn content independently.

Sudoku Puzzles – If you or your students enjoy the Sudoku puzzles that are sweeping the country, you’ll want to visit www.websudoku.com to get puzzles at a variety of difficulty levels that you can print out and use in your classroom.

Summer Opportunities For Teachers And Students

Mark your calendars for the week of June 5-9 and plan to attend one of the CRMC *Building Bridges* summer workshops. Specific details and registration information is found elsewhere in this newsletter. The workshops will concentrate on developing teachers’ skills at questioning. Teachers across all grade levels will work together for a portion of the workshop to consider ways to improve the quality of questions they use both in classroom discourse and in assessment. Teachers in the elementary, middle grades and high school workshops will look at specific content related to the new Georgia Performance Standards for those grade levels. The focus will be on broadening and deepening teachers’ understanding of the mathematics while modeling instructional strategies that can be implemented in the classroom. All of the workshops will incorporate a variety of hands-on activities as well as technology.

The cost of the workshops is \$200 for teachers from member systems and \$250 for teachers from non-member systems. The fee includes all workshop materials, refreshments, and lunch on Monday through Wednesday.

Teachers can further develop and refine skills learned in the workshop by teaching in one of the Collaborative’s summer camps. Teachers in the camps have the opportunity to “test drive” new lessons and activities with students before implementing them in their own classrooms. Past camp teachers have said that the opportunity to try out and refine lessons in the supportive camp environment has been a key factor in helping them incorporate new teaching methodologies into their classrooms. Teachers earn a \$400 stipend for teaching in camp.

In PRISM, rising 2nd through 5th graders will use the theme *Journey Into the Unknown* to explore mathematics in the context of

an undersea adventure. It will be held June 12-16 at the Elizabeth Bradley Turner Center. PRIME, the camp for rising 6th through 8th grade girls, and Power, the camp for rising 6th through 8th grade boys, will each use the theme *The Sights and Sounds of Mathematics*. Students will explore connections between mathematics and the arts as they create tessellating patterns, explore kaleidoscopes, and investigate relationships in music. PRIME will be June 12-16 and Power will be June 19-23. Both camps will be held at the Elizabeth Bradley Turner Center. PSI Camp (Problem Solving Investigations) is the camp for rising 9th through 11th graders. The theme will be *CSI:Mathematics* and will focus on mathematical applications that are useful in solving crimes. Many problems and activities will be based on the popular TV show NUMB3RS. PSI Camp will be June 12-16 at the Elizabeth Bradley Turner Center. All camps meet daily from 9:00 A.M. until 3:00 P.M. The cost for each camp is \$160, but students who register before May 3rd will get a \$10 discount. If you have students who might be interested in attending these camps, they may register online by going to <http://conted.colstate.edu>.

The camps are designed to appeal to students with a range of mathematical abilities and to excite them about and engage them in the study of mathematics. A major goal of all the camps is to help students see that mathematics can be fun. If you have students who could benefit from attending, please share this information with them. School business partners or Parent/Teacher Organizations might consider providing financial assistance to students who are interested in attending. Please contact the Math Collaborative if you need more information or if you would like hard copies of the registration form.

Columbus Regional Mathematics Collaborative Workshops

June 5-9, 2006

REGISTRATION FORM

Name _____ Certificate Type _____

SSN _____ - _____ - _____ Date of Birth _____

School _____ School System _____

School Address _____ School Phone () _____ - _____

Home Address _____ Home Phone () _____ - _____

All workshops are \$200 for member systems and \$250 for nonmember systems. Participants will receive 3 Professional Learning Units (PLUs). Additional professional development credit may be awarded for attendance at follow-up activities throughout the academic year. Cost includes materials, breakfast, and lunch on Monday, Tuesday and Wednesday. All workshops will be held in the Davidson Student Center at Columbus State University. Call (706) 568-2023 for directions.

Please check the workshop you will attend: All workshops begin promptly at 8:30 a.m.

_____ Building Bridges and Digging Deeper (Grades K-5)

_____ Building Bridges from Instruction to Assessment (Grades 6-8)

_____ Building Bridges to Performance Standards (Grades 9-12)

Please choose one of the following: _____ PLUs _____ Graduate Credit

If are asking for PLU credit, please complete the following:

I certify this person for participation in the above-named PLU credit program.

Signature of Superintendent or designee _____

Position _____ System _____

Please indicate method of payment:

*Purchase order number _____ Check (payable to CSU) Money Order

MC/Visa: _____ Account # _____ Exp. Date _____

Signature _____

*** Required if registration fee is being paid by school/school system; must be submitted with this form.**

Registration will not be accepted without a purchase order number.

Registration deadline is Friday, June 2, 2006. Return this form and method of payment to:

Continuing Education, Columbus State University, 4225 University Avenue, Columbus, GA 31907-5645.

2006 Summer Workshops

June 5-9 (8:30 a.m -4 p.m. on M, T, W; 8:30 a.m.-1:00 p.m. on Th and F)

Davidson Student Center

Elementary – Building Bridges and Digging Deeper

- Engage in rich mathematical activities designed to broaden and deepen knowledge of mathematics, especially topics addressed in the Georgia Performance Standards
- Learn to use children’s literature as a springboard for engaging students in a variety of hands-on learning tasks
- Develop the ability to use good questioning skills as a means of enriching classroom learning experiences including assessment

Middle Grades – Building Bridges from Instruction to Assessment

- Expand understanding of mathematics topics addressed in the Georgia Performance Standards through participation in hands-on activities
- Develop skills in selecting and developing rich mathematical tasks for instruction and assessment
- Develop the ability to use good questioning skills as a means of enriching classroom learning experiences including assessment

High School – Building Bridges to Performance Standards

- Engage in activities to deepen understanding of functions, coordinate geometry, and statistics
- Learn to implement instructional strategies in the model of the Georgia Performance Standards
- Develop the ability to use good questioning skills as a means of enriching classroom learning experiences including assessment

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Columbus Regional
Mathematics Collaborative

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