eREFLECTIONS

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Reflections on Reflections

Debbie Poss
President

As we start a new year and reflect on the old one, the 52nd Annual Georgia Mathematics Conference at Rock Eagle stands out as a wonderful experience - indeed it was "More Than Meets the Eye". Many, many thanks go to the GMC Board for their hard work and to all of you who volunteered to make this conference such a success!

It's not too early to start preparing for the 2012 school year, when we adopt the COMMON CORE GEORGIA PERFORMANCE STANDARDS. Although the state department has already hosted several webinars about the changes, you can still view them through "Elluminate Live" at https://www.georgiastandards.org. Spring GPS broadcasts are available here.

Both GCTM and the Georgia Department of Education will be hosting summer workshops to help teachers realize and meet the changes of the CCGPS. Watch the GCTM website for more information!

As the standards change, we must use much formative assessment to insure our students don't suffer from the "gaps" that might occur. At the end of the day, we teach students mathematics, and the word "student" comes first.

Just as we now have Process Standards, the CCGPS includes the Standards for Mathematical Practice that describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

We can start working on these today!

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

For more information about the Standards for Mathematical Process, go to http://www.corestandards.org/assets/CCSSI_Math%20Standards.pdf

Report from the Executive Board by Patti Barrett

GCTM Enters the Digital Age

As communication methods change so rapidly in this electronic world, the GCTM Executive Committee has felt the need to change also. While there has been a GCTM website, and therefore a webmaster, for a number of years, the Executive Committee now feels we need to change that title to Information Technology Director. Since the position of Webmaster was never added to the Constitution, the Executive Committee would like to propose a revised GCTM Constitution to include that office and the duties of that position. The Executive Committee would also like to revise Article IX Parliamentary Authority to allow for electronic meetings and voting when necessary. Robert's Rules of Order pertains to face-to-face meetings only.

Therefore, the Executive Committee would like to propose the revised GCTM Constitution to be voted on at the annual business meeting at Rock Eagle in October, 2012. The Executive Committee has also taken this opportunity to clean up some unclear language and some grammar and typographical errors. Changes and additions have been highlighted in yellow. Deletions have been highlighted in red. If you have questions or comments, contact Vice-President for Constitution and Policy at pwbarrett@valdosta.edu.

Membership Memos

Susan Craig
Membership Director

Happy New Year GCTM members! It was such a pleasure to meet so many of you at the Georgia Mathematics Conference at Rock Eagle in October. A million thanks to those of you who stopped by the Membership table and took the time to update your personal information in the online database. If you did not get a chance to do that in October, you can do so at any time from your home computer. If you have any difficulties, please just drop me a line at secddc@aol.com. Thanks also to the many life members who responded to our request to join the online group.

Our membership stands at 2178. As always we encourage you to help us recruit new members within your schools and universities. Our professional organization offers career-long benefits , which enrich our classrooms, students and colleagues each day. Joining is easy to do online through credit card or Paypal. Someone is out there just waiting for you to invite them to be a part of GCTM. Ask them today!

Best wishes for a wonderful semester ahead! May it be one of engaged students and inspirational classes each and every day!

The next Georgia Mathematics Conference is just around the corner! With all of our minds on the Common Core Standards and what they mean for us and for our students, we have chosen "COMMON CORE - Seeds for Success" as our theme.

Plan now to attend to broaden your understanding of our new standards. Plan now to speak to share your experience and expertise. The speaker proposal submission form will be available at www.gctm.org beginning February 15, 2012.

GCTM Garage Sale at Rock Eagle!

Do you have used mathematics materials, textbooks, manipulatives, or other mathematical items that you are not using? GCTM will again hold a garage sale at Rock Eagle! We are asking that you price your items that you bring and take them to designated place that will be in the GMC program. Any non-price items will be considered "Give-Aways!" Last year so many of you walked away with great items for your classrooms! Especially thankful where the new teachers and pre-service teachers that purchased these items! So look around your home and your classroom and if you are not using the items, mark them and bring them to the Garage Sale at Rock Eagle Math Conference in October!

We're Sorry, This Number Has Been Changed or Disconnected

by Jason F. Williams, GCTM Southwest Co-Representative

At times, it can be very difficult to stay in contact with other individuals. Whether it is GCTM trying to stay in contact with you or you trying to stay in contact with your students and their parents, technology is available to assist you with this.

When registering for GCTM and/when your contact information changes, it is important to update your information with GCTM. Please visit the GCTM webpage to make sure your contact information is current.

Google Voice is a free service by Google where you can select a phone number called your Google Voice number. One feature is that you can call parents and/or students without them knowing your phone number. Check out the many other advantages of using a Google Voice number by going to www.google.com/voice

Do you want to contact all your parents at one time? If so, you can use DialMyCalls.com in order to do this. You have the ability to make your own recording, set the time the call will be made, and see a report that lists how each call was answered. To learn more about this great resource, please go to www.dialmycalls.com.

These are 2 great resources to help you stay connected with students and parents, while keeping your personal information safe and secure.

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Taking on the Challenges of the CCGPS Together: Transition Standards and Their Implications *part 1 of 3*

As you know, schools in Georgia will be implementing the Common Core Georgia Performance Standards (CCGPS) starting in the 2012-13 school year. Although the CCGPS and the GPS are very closely aligned, the transition will not be without some challenges. In this series of brief essay, my goal is to **clarify some of the challenges**. In doing so, some possible ways to tackle them will (hopefully) become clear, and we can work together to overcome those challenges.

As it has been announced by Sandi Woodall, Mathematics Coordinator at the State Department of Education, during the webinar on CCGPS, the CCGPS will match 100% to the Common Core State Standards (CCSS), no more, no less. Thus, the CCGPS standards you will see is exactly the same set of standards as you see in the CCSS. However, some CCGPS standards will appear in 2 different grade levels in the 2012-13 school year. These standards are called transition standards and only in effect for grades K-8 during the 2012-13 school year. They are clearly highlighted in the document, CCGPS Teaching Guides (2012-2013), which can also be found the same web page as CCGPS standards . These standards deal with those concepts and procedures that are being taught in an earlier grade than they have been taught under the GPS.

If you pause and think about it, the need for such transition standards becomes clear. For example, in Grade 5, the 4th grade CCGPS standards MCC4NF.1, MCC4NF.2, MCC4N.3, and MCC4N.4, are listed as transition standards. These standards address equivalent fractions and operations with fractions. These topics will be discussed in Grade 4 under the CCGPS, but they are currently discussed in Grade 5 under the GPS. Therefore, fifth graders in the 2012-13 school year will not have seen these topics in the fourth grade (that is, this academic year). Thus, if they are not included in Grade 5 standards during the 2012-13 school year, students will have important prerequisite knowledge necessary for tackling Grade 5 CCGPS standards.

Fortunately, there are not many transition standards in the whole K-12 CCGPS (seen on the next few pages). Although the number of grade levels with transition standards are not many, these transition standards do pose real challenges to Georgia teachers and those who support them. In the next issue, I would like to discuss some of the specific challenges implied by these transition standards. In the meantime, I encourage everyone to go to the DOE web site and read the CCGPS Teaching Guide . The more familiar we become with the standards, the easier perhaps it is for us to devise more effective plans to tackle the challenges of the CCGPS. Together, we can overcome these challenges.

Tad Watanabe is a Professor of Mathematics Education in the Department of Mathematics & Statistics at Kennesaw State University. His primary responsibility at KSU is to teach mathematics content courses for prospective teachers. His research interest includes teaching and learning of multiplicative concepts such as fractions and proportional reasoning and lesson study.

Taking on the Challenges of the CCGPS Together: Transition Standards and Their Implications *cont.*

Grade	CCGPS
1	**MCCK.G.1** Describe objects in the environment using names of shapes, and describe the relative positions of these objects using terms such as above, below, beside, in front of, behind, and next to.
5	**MCC4.NF.1** Explain why a fraction a/b is equivalent to a fraction (n × a)/(n × b) by using visual fraction models, with attention to how the number and size of the parts differ even though the two fractions themselves are the same size. Use this principle to recognize and generate equivalent fractions. **MCC4.NF.2** Compare two fractions with different numerators and different denominators, e.g., by creating common denominators or numerators, or by comparing to a benchmark fraction such as 1/2. Recognize that comparisons are valid only when the two fractions refer to the same whole. Record the results of comparisons with symbols >, =, or <, and justify the conclusions, e.g., by using a visual fraction model. **MCC4.NF.3** Understand a fraction a/b with a > 1 as a sum of fractions 1/b. a. Understand addition and subtraction of fractions as joining and separating parts referring to the same whole. b. Decompose a fraction into a sum of fractions with the same denominator in more than one way, recording each decomposition by an equation. Justify decompositions, e.g., by using a visual fraction model. c. Add and subtract mixed numbers with like denominators, e.g., by replacing each mixed number with an equivalent fraction, and/or by using properties of operations and the relationship between addition and subtraction. d. Solve word problems involving addition and subtraction of fractions referring to the same whole and having like denominators, e.g., by using visual fraction models and equations to represent the problem. **MCC4.NF.4** Apply and extend previous understandings of multiplication to multiply a fraction by a whole number. a. Understand a fraction a/b as a multiple of 1/b. For example, use a visual fraction model to represent 5/4 as the product 5 × (1/4), recording the conclusion by the equation 5/4 = 5 × (1/4). b. Understand a multiple of a/b as a multiple of 1/b, and use this understanding to multiply a fraction by a whole number. For example, use a visual fraction model to express 3 × (2/5) as 6 × (1/5), recognizing this product as 6/5. (In general, n × (a/b) = (n × a)/b.) c. Solve word problems involving multiplication of a fraction by a whole number, e.g., by using visual fraction models and equations to represent the problem.
6	**CC5.NF.6** Solve real world problems involving multiplication of fractions and mixed numbers, e.g., by using visual fraction models or equations to represent the problem.
7	**CC.6.NS.5** Understand that positive and negative numbers are used together to describe quantities having opposite directions or values (e.g., temperature above/below zero, elevation above/below sea level, debits/credits, positive/negative electric charge); use positive and negative numbers to represent quantities in real-world contexts, explaining the meaning of 0 in each situation. ***continued on next page***

Taking on the Challenges of the CCGPS Together: Transition Standards and Their Implications *cont.*

	CC.6.NS.6 Understand a rational number as a point on the number line. Extend number line diagrams and coordinate axes familiar from previous grades to represent points on the line and in the plane with negative number coordinates. a. Recognize opposite signs of numbers as indicating locations on opposite sides of 0 on the number line; recognize that the opposite of the opposite of a number is the number itself, e.g., -(-3) = 3, and that 0 is its own opposite. b. Understand signs of numbers in ordered pairs as indicating locations in quadrants of the coordinate plane; recognize that when two ordered pairs differ only by signs, the locations of the points are related by reflections across one or both axes. c. Find and position integers and other rational numbers on a horizontal or vertical number line diagram; find and position pairs of integers and other rational numbers on a coordinate plane. **CC.6.NS.7** Understand ordering and absolute value of rational numbers. a. Interpret statements of inequality as statements about the relative position of two numbers on a number line diagram. b. Write, interpret, and explain statements of order for rational numbers in real-world contexts. c. Understand the absolute value of a rational number as its distance from 0 on the number line; interpret absolute value as magnitude for a positive or negative quantity in a real-world situation. d. Distinguish comparisons of absolute value from statements about order. **CC.6.NS.8** Solve real-world and mathematical problems by graphing points in all four quadrants of the coordinate plane. Include use of coordinates and absolute value to find distances between points with the same first coordinate or the same second coordinate. **CC.6.EE.3** Apply the properties of operations to generate equivalent expressions. **CC.6.EE.4** Identify when two expressions are equivalent (i.e., when the two expressions name the same number regardless of which value is substituted into them). **CC.6.EE.6** Use variables to represent numbers and write expressions when solving a real-world or mathematical problem; understand that a variable can represent an unknown number, or, depending on the purpose at hand, any number in a specified set. **CC.6.EE.8** Write an inequality of the form $x > c$ or $x < c$ to represent a constraint or condition in a real-world or mathematical problem. Recognize that inequalities of the form $x > c$ or $x < c$ have infinitely many solutions; represent solutions of such inequalities on number line diagrams. **CC.6.G.3** Draw polygons in the coordinate plane given coordinates for the vertices; use coordinates to find the length of a side joining points with the same first coordinate or the same second coordinate. Apply these techniques in the context of solving real-world and mathematical problems.
8	**CC.7.EE.4** Use variables to represent quantities in a real-world or mathematical problem, and construct simple equations and inequalities to solve problems by reasoning about the quantities. b. Solve word problems leading to inequalities of the form $px + q > r$ or $px + q < r$, where p, q, and r are specific rational numbers. Graph the solution set of the inequality and interpret it in the context of the problem. **CC.7.G.5** Use facts about supplementary, complementary, vertical, and adjacent angles in a multi-step problem to write and solve simple equations for an unknown angle in a figure. ***continued on next page***

Taking on the Challenges of the CCGPS Together: Transition Standards and Their Implications *cont.*

	CC.7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy. a. Develop a uniform probability model by assigning equal probability to all outcomes, and use the model to determine probabilities of events. b. Develop a probability model (which may not be uniform) by observing frequencies in data generated from a chance process. **CC.7.SP.8** Find probabilities of compound events using organized lists, tables, tree diagrams, and simulation. a. Understand that, just as with simple events, the probability of a compound event is the fraction of outcomes in the sample space for which the compound event occurs. b. Represent sample spaces for compound events using methods such as organized lists, tables and tree diagrams. For an event described in everyday language (e.g., "rolling double sixes"), identify the outcomes in the sample space which compose the event. c. Design and use a simulation to generate frequencies for compound events.
HS	**MCC8.G.8** Apply the Pythagorean Theorem to find the distance between two points in a coordinate system. **MCC8.G.9** Know the formulas for the volume of cones, cylinders, and spheres and use them to solve real-world and mathematical problems. **MCC6.SP.5** Summarize numerical data sets in relation to their context, such as by: c. Giving quantitative measures of center (median and/or mean) and variability (interquartile range and/or mean absolute deviation), as well as describing any overall pattern and any striking deviations from the overall pattern with reference to the context in which the data was gathered.

GCTM will be offering academies during the summer of 2012 to help Georgia teachers understand the CCGPS. To accomplish this we need first class instructors and aides. If your are interested in teaching teachers this summer, please send your resume to Peggy Pool or Debbie Poss. Our goal is to have every Georgia teacher ready to embark on this new adventure.

Coins, Quantity, and Concrete Representation

by Rachael Barr, Lauren McLain, and Katie McLendon

The degree of difficulty a student experiences when developing an abstract understanding of a math concept depends both on the learner and the concept. In this regard, teaching the value of coins can be a daunting task because traditional approaches do not target conceptual understandings of quantity. While teachers frequently use manipulatives like plastic money and coin value may be addressed, the conceptual relationship between the quantities of coins may be overlooked and the disproportionality between size and quantity may cause further confusion.

To address these challenges, manipulatives by *Learning with Alisha!* were purchased, in part, by a grant received from the Georgia Council for Teachers of Mathematics. The manipulatives were modified base-10 blocks and served to help a student gain understanding of the quantity of each coin and to understand differences in value in relationship to the penny, nickel, dime, and quarter. In order to differentiate between the modified base 10 blocks and the base 10 blocks typically used to teach place value, language was modified. Thus, the one block was referred to as a penny cube; the remainder of the adjusted names is available in Table 1. Additionally, there were two options for demonstrating the value of a dime; the student can work with a dime-rod that is two nickel-rods side by side or two nickel-rods placed together so that it resembles the base 10 rod used to represent 10 (Table 1). Students used these manipulatives with both explorative and direct instruction until they were able to synthesize information and understand that a quarter is the same quantity, or has the same value as, twenty-five pennies, 5 nickels, 2 dimes and a nickel, or any other variation, and not just identify that a quarter is "twenty-five".

Manipulatives were used in correspondence with the research-based concrete, representation, abstract (CRA) approach to

teaching mathematics (The Access Center, 2004). This is a sequence of instruction that transitions a student from using manipulatives to using representations to thinking abstractly about an idea. Figure 1 provides a picture of the manipulative (concrete), illustrates the representation, and demonstrates how the abstract piece was represented (symbols and digits). When using the manipulatives, students were guided to identify the number of units in each manipulative and to determine the relationship between the manipulatives (i.e. 5 penny cubes are the same quantity as one nickel-stick). After students demonstrated proficiency with this task, representations were drawn using graph paper with the manipulatives as a guide. Students were then taught the quantity associated with each coin (i.e. the nickel-stick is made of 5 penny-cubes like the nickel is the same quantity as 5 pennies). The end result was that learners of all abilities were able to identify the value of each coin and determine the quantity of a set of coins.

References:

Learning with Alisha! http://www.learningwithalisha.com

The Access Center: Improving Outcomes for All Students K-8. (2004). Concrete-representational- abstract instructional approach. Retrieved from http://www.k8accesscenter.org/training_resources/CRA_Instructional_Approach.asp

Rachael Barr, Lauren McLain, and Katie McLendon are interrelated special education teachers at Locust Grove Elementary School. They have taught for a collective 17 years and have worked with students in the general population and students with disabilities who have ranged from needing minimal support to students who require full day special education services from prekindergarten to grade five. The combined higher education experiences of all members include a B.S., M.Ed., and Ed.S. degrees in special education, intellectual disabilities, early childhood education, curriculum and instruction, and middle grades education. In the future, they have a continuing desire to diversify their professional experiences.

Name	Coin	Quantity	Manipulative	Manipulative Language	Representation	Abstract
Penny		1 cent		Penny-cube	11	1¢
Nickel		5 cents		Nickel-stick	01	5¢
Dime		10 cents	111 or	Dime-stick	0101010 or	10¢
Quarter		25 cents	11	Quarter-plate	01010101	25¢

The 2011 Georgia Mathematics Conference A Mathemagical Week!

by Nikita Patterson, 2012 Georgia Mathematics Conference Board Chair

This past year, the theme for the 52nd Annual Georgia Mathematics Conference was "More Than Meets the Eye", and this proved to be true. Approximately 1500 attendees joined us for a conference that focused on exploring mathematics and its applications in meaningful, exciting, and sometimes surprising ways. We showed many ways that mathematics can sometimes seem magical to both students and teachers. Here are some highlights of this year's conference.

We began on Wednesday with our open house style pre-conference sessions called "Hands-On Mathemagic". This proved to be a real treat for attendees who arrived early because they were able to receive supplies and instructions for exploring mathematics through games and tasks that can be used in their own classrooms. These sessions were "drop-in" style, so participants were able to come as they pleased, enjoy the activities, ask questions, network, and leave when they were satisfied --- with a goody bag of mathematical magic.

For our opening keynote that Wednesday, Dr. LouAnn Lovin kicked off our conference with a discussion on teaching learner-centered mathematics. We were very lucky to have Dr. Lovin, mathematics education professor, author, and former classroom teacher, visit us from James Madison University in Harrisonburg, VA.

Throughout the day on Thursday morning, there were presentations by featured speaker David Schwartz. Mr. Schwartz is an accomplished author and storyteller who used humor and visuals in his presentations. Elementary school teachers came away from his sessions with a wealth of unusual, whimsical ways to make math and science come alive.

Another of our featured speakers was Dr. Sloan Despeaux, associate professor of mathematics at Western Carolina University in Cullowhee, NC. She has a passion for mathematical history and literature that showed throughout her different sessions. She incorporated poetry into her lessons on mathematics and participants found her delightful.

We continued the theme of magic in mathematics with our Thursday keynote session featuring a great presentation by "mathemagician" Arthur Benjamin. Dr. Benjamin is a professor of mathematics at Harvey Mudd College in Claremont, CA. His presentation was highly entertaining as he shared his passion for mental mathematics and dazzled the conference participants. His talk was also interactive as he brought several participants to the stage to also take part in his amazing mathematics. Everyone who attended came away thinking he was nothing short of amazing!!

We closed the conference on Friday with a keynote presentation by our friend, David Hammett. David was a local mathematics teacher at South Cobb High School in Austell, GA for many years, later he was a teacher and department chair in North Hollywood, CA, and has worked as a mathematical consultant for several television game shows. He shared with us his unique perspective and it was a wonderful way to end a very successful conference week.

If you were at Rock Eagle for the 2011 conference, I'm sure it was magical for you as well. If you were not there, you truly missed a great time. You will definitely want to join us for the 53rd Annual Georgia Mathematics Conference October 17-19, 2012. Our theme for the conference is "Common Core: Seeds for Success." As you can see, this will be a huge year and you won't want to miss what we have in store.

See you in October!

GCTM 2011 AWARD WINNERS

Gladys M. Thomason Award
Lynn Stallings - Kennesaw State University, Marietta, GA

Dwight Love Award
Storie Atkins - Colmubus High School, Columbus, GA

John Neff Award
Shelly Allen - Richmond County Schools, August, GA

Teacher of Promise Award
John Hollar - Northeast Health Science Magnet High School, Macon, GA

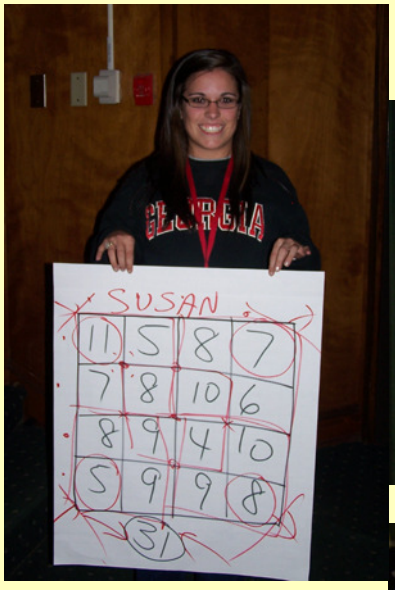
Elementary Teacher of Excellence Award
Kathy Spruiell - Stripling Elementary School, Norcross, GA

Photo Not Available

Secondary Teacher of Excellence Award
Donna Campbell - Emanuel County Institute, Twin City, GA

Rock Eagle Photo Gallery

Rock Eagle Photo Gallery



Web Finds from Cheryl! by Cheryl Hughes, Editor

Here are my two latest web discoveries. Try them and then email me to tell me how you are using them in your classroom.

TeachersPayTeachers.com

Lesson plans, SmartBoard activities, worksheets, PowerPoints, Unit plans, quizzes/tests, created by teachers and for teachers, are available on this website for free and for a minimal fee.

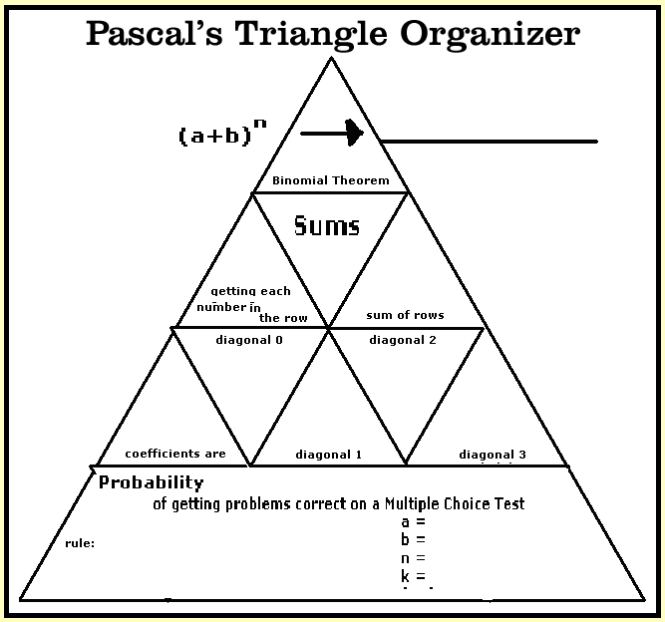
When you find ideas you like, you can choose to "follow" that teacher. TPT will notify you when that teacher posts something new.

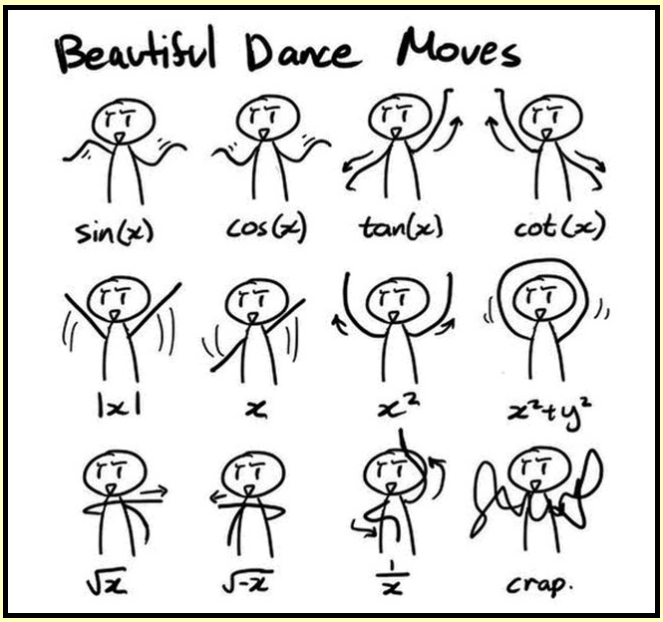
Email me if you are already offering to share or sell on TPT. Let's be sure Georgia teachers are well-represented.

Pinterest.com

Create your own bulletin boards, each with a different theme. On these boards you can "pin" a picture you find online, or pictures of websites you have found that you like. Later you can use those pictures or investigate the website further.

You can follow the bulletin boards of others (those that are public), and "repin" pictures or ideas they have found. Here's one I found:





GCTM Has a New Office and Phone Number

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