eREFLECTIONS

Publication of the Georgia Council of Teachers of Mathematics

Vol I
No. 3
Spring
2012

Reflections on Reflections

Debbie Poss
President

Teaching is the only profession whose job is to change the brain every day." When you reflect on Dr. David A. Sousa's comment, you realize once again how important it is that we carefully plan the short time we have with our students in order to maximize that impact. Brain scans show that "rote rehearsal" (memorizing facts, performing algorithms, doing repetitive tasks) only utilizes a portion of the brain, while "elaborate rehearsal" (solving word problems, making connections, analyzing patterns, explaining thought processes, thinking creatively) stimulates more areas of the brain, thus making it stronger. Make activities requiring a higher level of thinking and deeper depth of knowledge a routine part of your class.

Looking at the 8 Mathematical Practices from the CCSS, (which seem to meld the the Georgia's Mathematical Process Standards and Science Habits of Mind), we can see how these practices stimulate brain activity and enrich the classroom. For more information about these 8 Mathematical Practices, as well as a wonderful preparation to teach the CCGPS, check out the GCTM/GDOE Summer Academies this summer (www.gctm.org). These 3-day academies will prepare teachers from K-10 to teach the CCGPS by focusing on the 3 most important aspects of the educational philosophy - mathematical practices, content and assessment. Available at 8 locations throughout Georgia, there should be one fairly close to you. But register soon - these academies are filling up fast!

Another resource for the CCGPS is www.georgiastandards.org . Informative webinars are still in process and previous ones have been archived. If the website doesn't have what you need, check back with it later. They are updating it all the time!

Spring is in the air, and that means it's time to look at summer opportunities for teachers. The National Council of Teachers of Mathematics (NCTM) is holding a grade 3-8 Institute on Algebra Readiness in Atlanta July 31 - August 2. For more information, check out http://www.nctm.org/profdev/content.aspx?id=27438 . Teachers Teaching with Technology (T^3) is holding a regional conference at Kennesaw State University on Saturday, June 9. You will find the details in this journal. Other opportunities can be found on our website and if you know of anything that isn't up there, but should be, please contact our webmaster, Paul Oser.

Keep sharing the beauty and power of mathematics because:

"Mathematics is the Key to the Future."

GCTM Has a New Office and Phone Number

PO Box 5865
Augusta, GA 30916
1-855-ASK-GCTM

Membership Memos

Susan Craig
Membership Director

Happy Spring to all! GCTM membership is about average at this time. A summary of region membership follows:

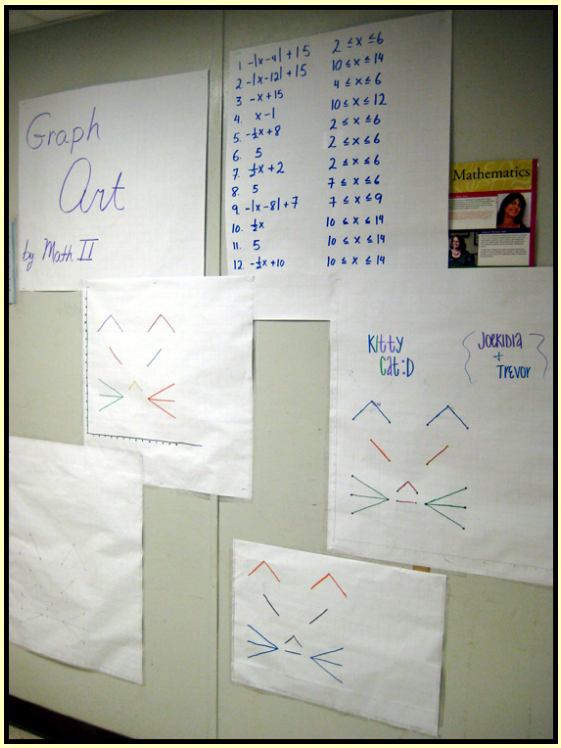
North West region - 299 members
North East region - 186 members
Metro West region - 449 members
Metro East region - 211 members
Central West region - 253 members
Central East region - 429 members
South West region - 214 members
South East region - 145 members
Total membership - 2186

With the previous issue of eReflections, we became aware that members might need to use personal email addresses rather than school addresses in their data base information. This is because many schools block mass emails, such as those sent by GCTM's website when we send you these issues of eReflections. Log in and edit your personal information to change to your personal email address. When editing, we request that you use correct postal mailing guidelines, i.e., don't use all lowercase, use GA for Georgia, add the extra 4 digits to your zip code. Thank you for helping us!

A Different Approach to Piecewise Functions

Emma Salzer
Southeast Co-Representative

In an attempt to engage students in learning and understanding piecewise functions, my co-teacher and I decided to take an artful approach. After a few days of piecewise instruction, we had the pairs of Math II Support students graph 12 functions with restricted domains. If graphed correctly a picture of a cat would emerge. The students were much more interested in graphing the "mystery picture" than graphing a piecewise function on a worksheet. The students worked very diligently on the "picture" and we learned very quickly what the problems were in graphing piecewise functions. A few samples of the artwork are shown in the picture.



T³ Regional STEM Conference

You are invited to attend the Teachers Teaching with Technology (T³) Regional STEM Conference to be held here at Kennesaw State University on Saturday, June 9, 2012. T³ Regional Conferences are open to all classroom teachers(K-12) and University educators interested in using educational technology to enhance their teaching and learning in Science, Technology, Engineering and Mathematics (STEM) disciplines. This year we will particularly emphasize connections to the Common Core State Standards.

Conference Registration is $60 and includes breakfast and lunch. Attendees can count on networking with teachers from across the region; learning from experienced educators; and participating in hands-on and demonstration sessions for new and experienced educators. You'll receive lots of great classroom activities and ideas, along with the latest news on Texas Instruments technology. And don't forget door prizes!

This conference has been endorsed by:

Who:
T³ Regional Conferences are open to all classroom teachers and University educators interested in using educational technology to enhance their teaching and learning in Mathematics and Science.

What:
Attendees can count on networking with teachers from across the region; learning from experienced educators; and participating in hands-on and demonstration sessions for new and experienced educators. You'll receive lots of great classroom activities and ideas, along with the latest news on Texas Instruments technology.

When:
Saturday, June 9, 2012

Key Information:
Teachers Teaching with Technology (T³) Regional STEM Conference will take place on the campus of Kennesaw State University. The Registration fee is $60.00, which includes breakfast and lunch. The deadline for receipt of payment is May 20, 2012.

How to Register:
1. Fill out the T³ Online Registration form. Application is only considered complete, once the registration fee is received. Deadline May 20, 2012.
2. Make Checks payable to : The A.T.O.M.S. Center
3. Mail in registration fee to: The A.T.O.M.S. Center
   ATTN: Dr. Nikita Patterson
   T3 Regional STEM Conference
   Kennesaw State University
   1000 Chastain Rd.
   The A.T.O.M.S. Center, MD 5900
   Kennesaw, GA 30144

The Stained Glass Window Project

by Susan Edwards, Ph.D.

Introduction

Susan Edwards, Ph.D

The stained glass window project is an authentic assessment that engages students in problem-solving within a real world context. The premise of this project is that the students are working for a stained glass window company. They must design a window, using construction paper and colored tissue paper, which meets certain specifications determined by the customer. The customer they are designing a window for wants specific geometric shapes in their window. Once the window is designed the students must answer questions to provide required information for the production department concerning the area of the glass that will be needed to produce the actual window.

Constructing the Windows

To make the windows, students use black construction paper to represent the supports in a stained glass window, and they use colored tissue paper to represent the glass. Students simply trace templates of geometric shapes that are cut from poster board to create the design they wish. Once the design is drawn, the shapes are cut out with scissors and tissue paper is glued to the back of the window.

For a copy of activity sheets for each grade level and more information go to: https://sites.google.com/site/mathstainedglasswindows/

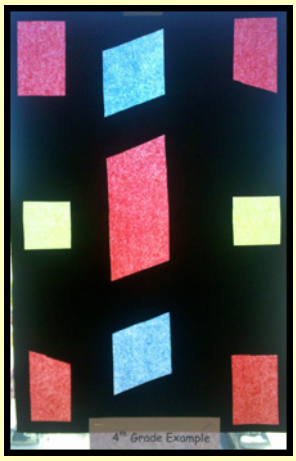
Susan Edwards, Ph.D. Assistant Professor
Augusta State University
Sedwar12@aug.edu

Content Involved

The project is ideal for helping students learn concepts related to polygons, area and scale factor. It incorporates both geometric and measurement concepts.

In 3rd grade, students can be given templates of the following polygons: rectangle, square, circle, scalene triangle, isosceles triangle, equilateral triangle, pentagon, hexagon, and trapezoid. The stipulation from the customer is that the window must include at least one of each of the polygons. The students design their windows and then list the names by color of the polygons included in their window. They then trade windows with a partner and list the polygons in their partner's window by color. For younger students it is best to use larger construction paper and shapes. Students may need assistance in cutting the shapes out of the construction paper (Georgia Performance Standards-M3G1).

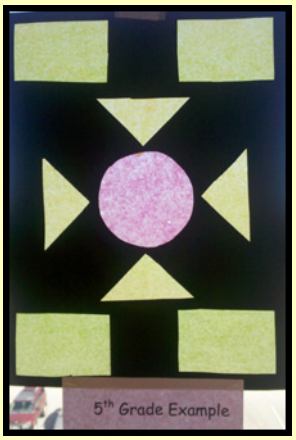
In 4th grade, students can be given templates of the following quadrilaterals: rectangle, square, parallelogram, trapezoid, and rhombus. The students not only must identify the quadrilaterals included in their window, but must also combine two (or more) of these polygons together to create a larger quadrilateral. For example, two rhombi



The Stained Glass Window Project *cont.*

can be placed side by side to create a larger parallelogram. Students must name the quadrilaterals by color in their window and justify those conclusions by describing the characteristics of each polygon. They then trade windows with a partner and list the quadrilaterals by color in their partner's window (Georgia Performance Standards-M4G1).

In 5th grade, students are given templates of rectangles, triangles, and circles with whole number dimensions. The stipulation from the customer is that the window must have at least one of each of the three geometric shapes. Once they design the window, the students find the area of the various polygons and the total area of the glass of the window (Georgia Performance Standards-M5M1).



In 6th grade, students are given templates of rectangles, triangles and circles which have fractional dimensions. The stipulation from the customer is that the window must have at least one of each of the three geometric shapes. Once they design their windows, they find the area of the various polygons and the total area of the glass of the window (Georgia Performance Standards-M6M2).

In 7th grade, students are given templates of rectangles, triangles and circles. The stipulation from the customer is that the window must have at least one of each of the three geometric shapes. Once they design their window, they must determine the dimensions and area of every part for a window 2 ¼ times larger than the sample (Georgia Performance Standards-M7G3).

Differentiation

This project offers many opportunities for differentiation. By providing more structure and scaffolding, and lowering the cognitive demand, students who may be struggling can focus only on the standard being addressed. By removing structure and scaffolding, and increasing the cognitive demand, higher-achieving students can be challenged to a higher level of critical thinking.

Possibilities for Differentiation for Struggling Students

- Guided handout with more structure
- Give shapes cut out with whole number dimensions
- Limit color choices to two colors
- Multiple check-in points throughout the project
- Provide formulas

The Stained Glass Window Project *cont.*

Possibilities for Differentiation for High Performing Students

- Guided handout with more structure
- Give shapes cut out with whole number dimensions
- Limit color choices to two colors
- Multiple check-in points throughout the project
- Provide formulas
- Have to construct shapes given dimensions
- Use fractional dimensions
- Give dimensions of actual window and construction paper. They have to figure out the ratio.
- Can use multiple colors
- Question about producing 20 windows
- Can create irregular figures made up of smaller shapes.
- Add stipulation that the customer wants a certain amount of particular colors (e.g. at least 20in^2 of red)
- Find the area of the black

Sample Activity

You are working as a designer in a stained glass window company. The customer wants windows with patterns made up of only triangles, rectangles, and circles. Your task is to design a sample window using black construction paper (to represent the supports) and colored tissue paper (which will represent the glass). Download the rest of the activity here!

Integration with other subjects

There are opportunities to integrate this project with other subjects. For example, if using this in a 7th grade classroom, the book Mosque by David Macaulay is a great literature choice to accompany this project. The book describes the building of a mosque including stained glass windows in sixteenth-century Istanbul, a clear connection to the seventh grade social studies standards requiring the study of Islam and the Middle East.

Another example for integration is the book Mama's Window by Lynn Rubright. This story takes place in the Mississippi Delta and is loosely based on the childhood experiences of Reverend Owen H. Whitfield, an African-American sharecropper and minister in Arkansas during the Great Depression. The story centers around James Earle Sugar Martin's mother who has taken on extra work to earn money for a stained-glass window for their new church.

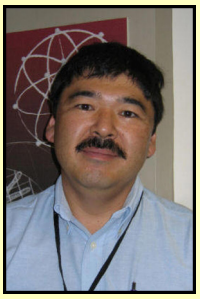
Conclusion

This project provides rich opportunities for students in various grade levels to engage in mathematical reasoning around important geometric and measurement concepts. The context for the project is of interest to students in grades 3-7, and the project has particular appeal to students who are artistic or creative. The opportunities to integrate this mathematics project with language arts and social studies make it a great choice for a middle level classroom.

*e*REFLECTIONS is designed by The Digital Pen, Rome, GA

www.thedigitalpen.com · 706-346-8731

Taking on the Challenges of the CCGPS Together: Transition Standards and Their Implications *part 2 of 3*



Tad Watanabe

In the last issue, we discussed one of the challenges posed by transition standards - the issue of time. In this issue, we want to look at another challenge - in fact, I believe this is the most significant challenge of the CCGPS. Remember that these transition standards are there for the school year 2012-13 because the topics discussed in the transition standards have been shifted to an earlier grade. For example, let's look at MCC4.NF.1, which is a Grade 5 transition standard:

> Explain why a fraction a/b is equivalent to a fraction $(n \times a)/(n \times b)$ 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.

This standard corresponds to the GPS M5N4 b and c. Thus, fifth grade teachers are familiar with this standard already. They are not asked to teach a new topic when they teach this transition standard. In fact, the 2012-13 school year will be the last time they have to teach this idea in Grade 5. Starting with the 2013-14 school year, fifth grade teachers may have to remind students about MCCN4.NF.1 as they discuss addition and subtraction of unlike denominators. However, because the standard is taught in Grade 4, it will no longer be a major focus of instruction in Grade 5.

On the other hand, Grade 4 teachers face a more significant, challenge. In the current GPS, M4N6a expects students to understand that some fractions that look different may still represent the same number and quantity, but they are not necessarily developing the formula for generating equivalent fractions. Thus, Grade 4 teachers are expected to push students further than they have been expected under the GPS. Perhaps the distance between understanding why 2/3 = 4/6, maybe through the use of concrete materials, and understanding expected in MCC4.NF.1, "the value of a fraction is not changed when both its numerator and denominator are multiplied or divided by the same number" (M5N4b) isn't so significant. However, another transition standard in Grade 5, MCC4.NF.4, which deals with the idea of multiplying fractions by whole numbers will be a completely new topic in Grade 4. How can we teach this topic that was previously taught in Grade 5 to fourth graders? Collaborating with Grade 5 teachers to learn about what they currently do may be helpful. On the other hand, perhaps the treatments of fractions and fraction operations are significantly different that not everything the current Grade 5 teachers do is appropriate with to do fourth graders in the 2012-13 school year (and beyond). The split of fraction multiplication into 2 stages, multiplying fractions by whole numbers in Grade 4 and multiplying fractions by fractions in Grade 5, appears similar to the way multiplication of decimal numbers are treated in the GPS. Is there anything we learned from that experience that can perhaps inform us as we try to teach MCC4.NF.3 and 4? The CCGPS emphasizes the use of a linear model in dealing with fractions, but how can we incorporate linear models in learning of MCC4.NF.3 and 4?

The examples above suggest that perhaps the way the transition standards are currently listed in the Teaching Guide document is misleading in that the teachers who will be most affected by the implementation of the CCGPS may not recognize the

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

impact. Moreover, whether or not a topic came from a grade level above or grade level below, it might be helpful if the document identified those topics that are new in each grade level clearly. Perhaps one potentially useful professional development activity is for grade level teams to go through the CCGPS and identify those topics that have not been addressed in their grades under the GPS. Then, they can discuss with other grade level teams to identify where those topics were addressed previously and exchange ideas on how to effectively approach them.

I have discussed only a few of the challenges that arise as we start thinking about the implementation of the CCGPS. Although the CCSS and the GPS may align well, there are still some changes that require significant amount of thought and effort. They are perhaps overwhelming if teachers try to tackle them individually - maybe it is too much even for grade-level or vertical teams at a single school building. We know the value of collaboration in mathematics learning, but it appears that we need to collaborate more than ever as we face the challenge of implementing the CCGPS. Moreover, we need a systematic way to disseminate the efforts of a variety of individuals and groups throughout the state so that they can be more widely shared, examined, and improved upon. I hope members of the GCTM will use *e*REFLECTIONS as one way to disseminate their ideas to support the implementation of the CCGPS.

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.

GCTM Has Something New for You!

Although GCTM has held summer academies in the past, this is the first time we have held eight 3-day academies across Georgia during 6 weeks of the summer in partnership with the Georgia Department of Education. Approximately 3, 100 K-12 Georgia teachers of mathematics will be better prepared to teach the CCGPS because they will be attending one of these academies. All of this is being done by volunteer members of GCTM! Yes, you read this correctly… close to 100 GCTM members have volunteered their expertise and time to assure these academies are a success in supporting teachers of mathematics as we move toward implementing the new Common Core Standards.

You may register today at www.gctm.org for the location/dates of your choice.

Academy #1:	June 11-13	Atlanta/DeKalb County
Academy #2:	June 13-15	Jackson County
Academy #3:	June 19-21	Fannin County
Academy #4:	June 25-27	Cobb/Paulding County
Academy #5:	June 27-29	Lowndes County
Academy #6:	July 10-12	Richmond County
Academy #7:	July 17-19	Houston/Bibb Count
Academy #8:	July 24-26	Chatham County

A registration fee of $25 will give you three days of quality training with all of the supporting materials. Hurry, because even though the registration deadline is not until May 28, 2012, several sessions have already been filled to capacity and closed. More information is available here.

Math Competition Update

Chuck Garner
Vice President of Competitions

The State Mathematics Tournament will be Saturday, April 28, at Macon State College. This tournament is invitation only! The best 36 schools in the state (as determined by submitted results from other tournaments in Georgia) are invited to bring a four-student team to compete for the state math championship. The list of invited schools will be posted on http://www.gctm.org/StateTournament no later than April 3. Any questions regarding invitations should be directed to Tom Fulton, the Tournament Secretary, at tfulton42@gmail.com. All other questions should be directed to Chuck Garner at cgarner@gctm.org.

Do you want to get your Math Team prepared for the State Math Tournament? Or are you just looking for challenging problems for your students? Then the two published volumes of State Math Tournaments are perfect! Volume 5, collecting the 2005-2010 tournaments, was published last year, and Volume 4, collecting the 1998-2004 tournaments, is new this year! Included in each book are all problems from the tests and ciphering rounds with full solutions. Each problem is also categorized and indexed, so you can easily find challenging problems on any topic. For more information and pricing, visit http://www.gctm.org/tournament_book. All proceeds from sales of the book go towards the State Math Tournament.

Finally, the nationwide math team competition, American Regions Mathematics League (ARML) is June 2 at the University of Georgia. The coaching staff of the Georgia ARML team will field four teams of 15 students each to vie for the national championship. Over 130 teams for around the globe will be competing simultaneously at four sites in the U.S. on June 2: Penn State, UNLV, Iowa, and UGA. The Georgia ARML team has placed in the top 15 for 21 years, and we hope the Georgia ARML team wins the national title this year. Since the competition is at UGA, the ARML organizers ask for volunteers to help run the event. Please consider volunteering to staff the merchandise table, for chaperoning, for proctoring portions of the competition, or other miscellaneous duties. If you are interested in helping a nationwide event run smoothly and successfully, please contact UGA Site Coordinator and Head Coach for the Georgia ARML team, Don Slater, at Don.Slater@cobbk12.org.

GCTM MIDDLE SCHOOL MATHEMATICS TOURNAMENT

SATURDAY, APRIL 21, 2012

Fun, competition, lunch, prizes, trophies!

Competition to be held at:

Thomson Middle School
Centerville, Georgia

For more information and to register, visit the competition link at www.gctm.org.

Matrix Multiplication: A More Spatially Intuitive Approach

by Bill Shillito, C2 Education (East Cobb)

***CCGPS Standard*: MCC9-12.N.VM.8 (+) Add, subtract, and multiply matrices of appropriate dimensions.**

Matrices are arguably some of the most powerful tools available to us as mathematicians. They allow us to pack lots of data together in an easy-to-visualize form, and by combining matrices through the operations defined on them, they have an almost endless array of applications. Unfortunately, when our students are first introduced to matrix multiplication, their eyes glaze over out of sheer confusion because the definition of matrix multiplication is incredibly complicated compared to that of matrix addition. In addition, most attempts to make it easier involve hand movements that basically boil down to the mathematical equivalent of rubbing your head and patting your stomach at the same time. (Or was it patting your head and rubbing your stomach? I always forget which way it goes…)

When two matrices are multiplied, each entry $x_{i,j}$ (i-th row, j-th column) in the resultant matrix is found by multiplying all the entries of the i-th row of the first matrix by all the entries in the j-th column of the second matrix, then adding all of these products together. So:

$$\begin{bmatrix} 1 & 2 & 3 & 1 \\ 1 & 2 & 0 & 4 \\ 2 & 1 & 3 & 0 \end{bmatrix} \begin{bmatrix} 3 & 2 \\ 3 & 1 \\ 2 & 0 \\ 1 & 4 \end{bmatrix} = \begin{bmatrix} 16 & 8 \\ 13 & 20 \\ 15 & 5 \end{bmatrix}$$

In this example, the entry $x_{2,1}$ (second row, first column) is found to be:

$$1 \cdot 3 + 2 \cdot 3 + 0 \cdot 2 + 4 \cdot 1 = 13$$

However, when trying to calculate this, students find themselves getting lost trying to both keep track of where they are and find the products of the entries.

The dimensions of the resultant matrix can also often be confusing to students. When an $m \times n$ matrix (m rows, n columns) is multiplied by an $n \times r$ matrix, the result will be an $m \times r$ matrix. Therefore, for matrix multiplication as defined above to even be defined, the number of columns of the first matrix must equal the number of rows of the second matrix. Unfortunately, these facts are often relegated to the status of mere rules, to be memorized rather than understood.

With these problems in mind, I offer a new method of visualizing matrix multiplication that has helped a number of my students. Instead of writing the two matrices to be multiplied adjacent to each other, we take the second matrix and shift it upward, like this:

$$\begin{array}{cc} & \begin{bmatrix} 3 & 2 \\ 3 & 1 \\ 2 & 0 \\ 1 & 4 \end{bmatrix} \\ \begin{bmatrix} 1 & 2 & 3 & 1 \\ 1 & 2 & 0 & 4 \\ 2 & 1 & 3 & 0 \end{bmatrix} & \begin{bmatrix} \cdot & \cdot \\ \cdot & \cdot \\ \cdot & \cdot \end{bmatrix} \end{array}$$

Matrix Multiplication: A More Spatially Intuitive Approach *cont.*

The result after multiplication will appear in the blank matrix to the bottom right. With the matrices arranged like this, the multiplication becomes more natural: everything falls neatly into place. For instance, to find the entry $x_{2,1}$ as above, it is much more intuitive to multiply everything from the second row of the first matrix by the first column of the second matrix:

$$\begin{array}{cc} & \begin{bmatrix} 3 & 2 \\ 3 & 1 \\ 2 & 0 \\ 1 & 4 \end{bmatrix} \\ \begin{bmatrix} 1 & 2 & 3 & 1 \\ 1 & 2 & 0 & 4 \\ 2 & 1 & 3 & 0 \end{bmatrix} & \begin{bmatrix} \cdot & \cdot \\ 13 & \cdot \\ \cdot & \cdot \end{bmatrix} \end{array}$$

The rest of the entries can also be computed in this way. Because the entry being calculated is always to the right of the row and under the column needed to calculate it, students do not lose their place. In fact, this method of calculation closely resembles something students have been familiar with since elementary school:

Times Table - 12x12

	1	2	3	4	5	6	7	8	9	10	11	12
1	**1**	2	3	4	5	6	7	8	9	10	11	12
2	2	**4**	6	8	10	12	14	16	18	20	22	24
3	3	6	**9**	12	15	18	21	24	27	30	33	36
4	4	8	12	**16**	20	24	28	32	36	40	44	48
5	5	10	15	20	**25**	30	35	40	45	50	55	60
6	6	12	18	24	30	**36**	42	48	54	60	66	72
7	7	14	21	28	35	42	**49**	56	63	70	77	84
8	8	16	24	32	40	48	56	**64**	72	80	88	96
9	9	18	27	36	45	54	63	72	**81**	90	99	108
10	10	20	30	40	50	60	70	80	90	**100**	110	120
11	11	22	33	44	55	66	77	88	99	110	**121**	132
12	12	24	36	48	60	72	84	96	108	120	132	**144**

As it turns out, it's not just that matrix multiplication mimics a multiplication table; rather, a multiplication table is an **example** of matrix multiplication! The table above is the result of multiplying a ***12* x *1*** "column matrix" by a ***1* x *12*** "row matrix," for which the entries in each are the natural numbers 1 through 12.

An added benefit of this method is how it neatly integrates both the requirements for matrix multiplication and the dimension of the resultant matrix. First of all, the spatial placement of the two factor matrices intuitively suggests the dimensions of the resultant matrix. Second of all, if the factor matrices can't be multiplied because their dimensions are invalid, the students will notice on their own that they'll run out of rows or columns! No longer are these properties just rules to be memorized; they instead become an inherent part of the entire process.

Further reading on matrix multiplication—as well as the source of this method—can be found on Wikipedia.

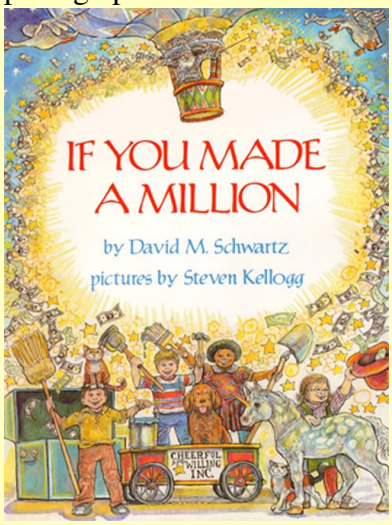
Bill Shillito is the lead instructor and math tutor at C2 Education in East Cobb. He is a graduate of Lassiter High School and Georgia Institute of Technology, and is currently pursuing his Master's of Arts in Teaching Mathematics. His career goal is to become a high school (especially calculus) teacher."

Author David Schwartz Coming to a School Near Your

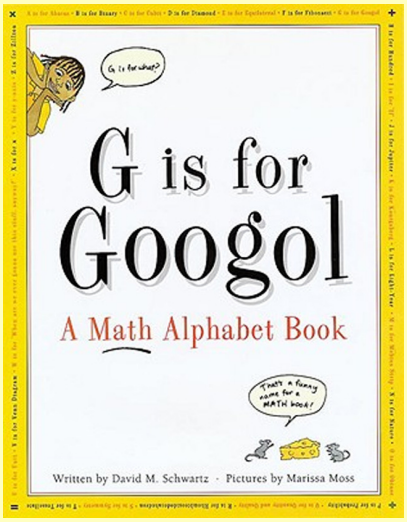
David Schwartz

Former teacher David Schwartz began his second career when a classroom activity and a faculty lounge conversation with a colleague led him to write a magazine article that was published in Smithsonian. From there he went on to become one of America's most-loved authors of math and science books for children.

During his first years as a classroom teacher it was his responsibility to comment on each student's progress in his class on their report card. Some of his colleagues were impressed with his writing, and mentioned it to him. One in particular was a fellow teacher who accompanied David and his class when they drove around the countryside looking at weather vanes, a folk art form, on barns in Vermont. He asked David to write a companion piece to the photographs he was going to take, and the goal was to submit it to a magazine. David wrote the article, which was accepted by Smithsonian Magazine for publication, but his friend did not follow through with the photographs of the weather vanes. The Smithsonian Magazine liked the article so much that they sent a staff photographer to get the pictures, and the article was published.



His professional development was achieved by following his childhood musings into the world of children's books. Having always loved big numbers, he decided to write a book about them. After a dozen revisions and even more rejections from publishers, his first book, How Much Is a Million? was published to widespread acclaim in 1985. It has become a classic in the genre of math literature and is still going strong more than a quarter-century later. David has followed it with over 50 other books about math or science (many of them bridging the two subjects). If You Made a Million, Millions to Measure, If You Hopped Like a Frog, If Dogs Were Dinosaurs and G Is for Googol: A Math Alphabet Book are but a few of the popular titles he has published.



David also has a career bringing his excitement about math, and his talent for explaining difficult concepts in an entertaining way, to audiences of children in schools and teachers at conferences. He was a keynote speaker at the Georgia Mathematics Conference last fall. He has given author presentations (more like performances) at over 1,000 schools in the USA and many overseas. At the very moment this is being written, he is visiting Brazil to speak at an American school in that country, having done the same in Israel just last month.

David will be speaking at schools in Georgia in 2012-13. For further information about possibly bringing him to yours, you may contact him at david@davidschwartz.com or through his website, www.davidschwartz.com.

Save the Date!
The 53rd Georgia Mathematics Conference
Rock Eagle 4-H Center
October 17-19, 2012

Featured Speakers

Dr. Brad Findell, member of the Mathematics Work Team for the Common Core State Standards now working as a consultant focusing on the implementation of the Common Core State Standards and one of the authors of the National Research Center publication Adding It Up: Helping Children Learn Mathematics (2001)

Dr. Christine Franklin, Senior Lecturer in Statistics at the University of Georgia and lead writer for the American Statistical Association Pre-K-12 Guidelines for the Assessment and Instruction in Statistics Education (GAISE) Framework that influenced the Common Core State Statistics Standards

Dr. Irina Lyublinskaya, an associate professor in the Department of Education at the College of Staten Island/CUNY and co-director of The Discovery Institute who has been featured in the ASCD Constructivist Series Video "Putting the Learner First"

Stuart J. Murphy, author of numerous children's books in the MathStart series focused on mathematics and in the I See I Learn series for preschoolers and kindergartners focused on skills from one of four domains: cognitive, social, health and safety, and emotional

Dr. Juli Dixon, Professor of Mathematics Education at the University of Central Florida with interests related to developing and deepening teachers' mathematics content knowledge for teaching and communicating and justifying mathematical ideas

Illuminations, grade level sessions focused on resources containing lessons, activities, and web links

Keynote Speakers

Dr. Tim Kanold, a mathematics educator and former President of the National Council of Supervisors of Mathematics and the lead author for NCTM's update of the Teaching Performance Standards Document

Dr. Larry Lesser, a "mathemusician" and mathematics profession who has merged two of his great loves - math and music to create entertaining, unique and popular math songs with lyrics about math topics such as infinity, pi, problem solving, graphing functions, as worldly applications such as understanding the lottery

Dr. Francis (Skip) Fennell, former President of the National Council of Teachers of Mathematics (NCTM, 2006-2008) and a professor of education at McDaniel College in Westminster, Maryland and one of the writers of the Principles and Standards for School Mathematics (NCTM, 2000) and of the Curriculum Focal Points for PreK-8 (NCTM, 2006)

53rd Annual Georgia Mathematics Conference
CommonCore
Seeds for Success
October 17 - 19, 2012