

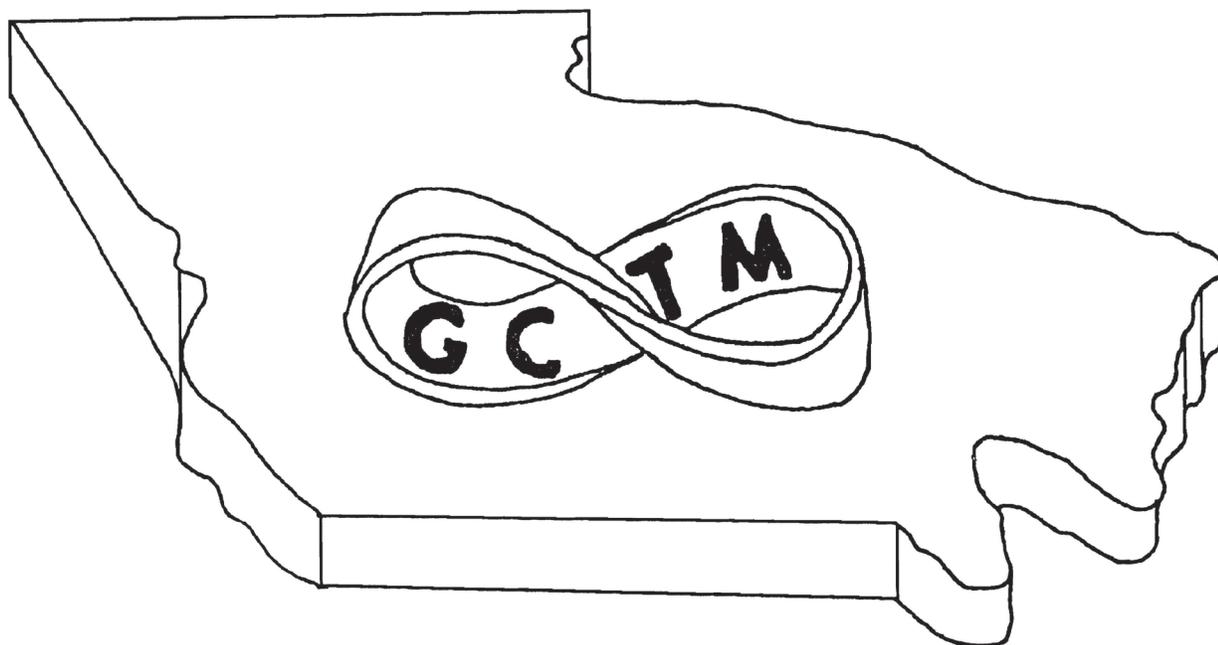


REFLECTIONS

BEEFLECTIONS

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Manuscripts should be double-spaced, with 1-inch margins on all sides, typed in 12-point font and follow the APA 5th Edition style guide. Manuscripts should be submitted in MS Word. If you have a picture or graphic in the text, please include the original picture(s) in a separate file.

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REFLECTIONS REFLECTIONS

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President's Welcome

by Lynn Stallings

GCTM President

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What's New?

At the recent biennial GCTM Executive Board Retreat, we talked extensively about the strategic goals for our organization. After much debate, we settled on the following three major goals for the rest of my term, continuing into President-Elect Debbie Poss's term:

Collaboration and Communication

- Provide vehicles for teachers to share professional knowledge.
- Provide relevant, timely professional development.
- Strengthen connections with organizations with similar goals.
- Advocacy and Publicity
- Impact public opinion on the learning of mathematics.
- Raise the profile of GCTM.
- Be proactive on issues relevant to mathematics education.
- Build relationships with policy makers.
- Review the processes and structures of GCTM.

One way we'd like to improve communication is by setting up a GCTM Facebook page. To find it, type GCTM in the search box and then press the "Join" button. Just be careful not to join the "Global Center Travian Monitoring" gaming group instead. We can use this Facebook group to share information, teaching ideas, even Rock Eagle presentation materials. I invite those of you who are Facebook aficionados to pioneer new ways we can use it to share information and help each other as mathematics teachers.

So much is going on in mathematics education that I want to use this column to discuss three timely topics and what they may mean for us:

- Race to the Top
- Changes to Georgia's teacher certification system
- Release of K-12 Common Core standards

Race to the Top

Last summer President Barack Obama announced the Race to the Top (sometimes called RT3) funding program. He explained, "We want to challenge all the stakeholders—parents, teachers, unions, school administrators—to not only raise standards, but make the changes that are required to actually meet those standards, by having the best teachers and principals, by having the kind of data collection that tells us whether improvements are actually happening, and tying student achievement to assessments of teachers, by making sure that

there's a focus on low-performing schools, by making sure that the standards that have been set are ones that mean a kid who graduates can compete at the international level."

Race to the Top is a competitive grant program that will give \$4.25 billion in economic stimulus money to states who propose ways of achieving those goals. The four major areas of focus are

“adopting standards and assessments that prepare students to succeed in college and the workplace and to compete in the global economy;
building data systems that measure student growth and success, and inform teachers and principals about how they can improve instruction;
recruiting, preparing, rewarding, and retaining effective teachers and principals, especially where they are needed the most; and
turning around our lowest-achieving schools.” (from Governor Perdue's January 20, 2010 press release, cited below).

In January, Georgia submitted a proposal for \$462 million. Georgia's application was written collaboratively by the Governor's Office, the Office of Student Achievement, the Georgia Department of Education, and other education stakeholders. The proposal was critically reviewed by a representative panel of teachers, principals, superintendents, university faculty, members of other education organizations, state policy makers, and others. Twenty three Georgia school districts have signed on to participate: Atlanta, Ben Hill, Bibb, Burke, Carrollton, Chatham, Cherokee, Clayton, DeKalb, Dougherty, Gainesville., Gwinnett, Hall, Henry, Jones, Meriwether, Muscogee, Rabun, Richmond, Rockdale, Spalding, Valdosta, and White.

Georgia was one of only 15 states that was assisted in preparing our Race to the Top proposal by the Bill and Melinda Gates Foundation, selected because of our current educational policies and reforms. Winners of this first round of competition for the Race to the Top funds will be announced soon, in April 2010. Competition will be fierce, as 40 states and the District of Columbia applied.

For further information:

Official U.S. Department of Education announcement of Race to the Top Funding Program: <http://www2.ed.gov/programs/racetothetop/index.html>

Governor Perdue's January 20, 2010 press release: http://gov.georgia.gov/00/press/detail/0.,78006749_154885747_155733684,00.html



Georgia's entire application:
http://gov.georgia.gov/00/press/detail/0,2668,78006749_154885747_155733684,00.html

Final Draft of Common Core Standards

In the last issue of *Reflections*, we talked about the Common Core Standards. As a reminder, the Common State Standards Initiative (CSSI) is a collaborative effort between the National Governors Association Center for Best Practices (NGA Center) and the Council of Chief State School Officers (CCSSO), along with Achieve, ACT, and the College Board. Their goal was to adopt a common core set of standards for K-12 in mathematics and English-language arts so that the United States can retain our competitive edge globally.

This fall a K-8 draft was released for feedback and input. Now the final draft K-12 has been released for validation. States will be working on plans for implementing these standards later in 2010. The other major component of the CSSI is that all states benchmark against international standards. They argue that "new economic realities mean it no longer matters how one U.S. state compares to another on a national test; what matters is how a state's students compare to those in countries around the globe. America must seize this moment to ensure that we have workers whose knowledge, skills, and talents are competitive with the best in the world."

For further information:

Common Core Standards:
<http://www.corestandards.org/Standards/index.htm>
Development and feedback teams:
<http://www.corestandards.org/Files/K-12DevelopmentTeam.pdf>
International Benchmarking Report:
<http://www.nga.org/Files/pdf/0812BENCHMARKING.PDF>

Proposed Changes to Georgia's Teacher Certification System

The Georgia Professional Standards Commission is considering changes to how teaching certificates are upgraded. The main idea is that student achievement instead of graduate degrees would become the primary means of moving from one certificate level to another. The changes also impact the first teaching certificates all teachers would hold. I'm going to explain the proposals under discussion. These proposals haven't been finalized yet, but should give you some idea of what may be coming.

Preservice teachers would have to have a Pre-Service Teacher Certificate during student teaching. After completing an initial certification program or beginning GaTAPP, and upon employment, a teacher would be issued an Induction Teacher Certificate, a three-year, nonrenewable certificate. Before moving to the clear renewable Career Teacher Certificate, a teacher would need to show evidence of student achievement and complete the Georgia Induction Program, as well as being recommended by their employing school system and their university or GaTAPP.

An upgrade from a Career Teacher Certificate to a Master Teacher Certificate would involve satisfactory evaluations, evidence of student achievement, recommendation by school system, no ethical sanctions, and holding Teacher Leadership Endorsement. The highest level of teaching certificate is the Teacher Leader Certificate, and it requires at least five years of successful teaching, meeting federal definition of highly qualified, recommendation by school system, a master's degree or higher in relevant field, no ethics violations, and selection by principal and school leadership team.

Another area of proposed change is that graduate degrees have to be in fields closely aligned with the area you teach to count towards a certificate upgrade. Note that in the paragraph above, it said that the certificate upgrade would be based on a Master's degree in a relevant area. How to define what degrees are relevant to different areas of teacher certification is being discussed.

For further information:

Some information is in the fall newsletter:
http://www.gapsc.com/MessageCenter/downloads/PSC_Pulse_2009_Fall.pdf

Watch <http://www.gapsc.com/> or the GCTM Facebook page for further details.

Summary

I don't know when in my 25-year teaching career have so many changes been underway simultaneously. It's both scary and exciting! With our rigorous GPS curriculum, Georgia moved boldly into the national spotlight as a leader in curriculum reform. Georgia's



relatively low ranking on many education measures means we have the opportunity to make tremendous strides. Within our teaching careers, we'll see that leadership pays off in a possible Reach for the Top grant, the implementation of the Common Core Standards, and gradually mathematics achievement we can be proud of for all of Georgia's children.

What can we do? Stay informed about these issues. Stay engaged in these discussions. Be open to change. Keep asking yourself what else we can do that will ensure Georgia children learn more mathematics than ever before. Our current economic challenges show we need to push harder to maintain our competitive edge.

Read the following quote and think of how your students want to stay in their "comfort zone," rather than pushing to grow and to learn more.

"If you want to feel secure, do what you already know how to do. If you want to be a true professional and continue to grow. . . go to the cutting-edge of your competence."

--Madeline Hunter, 1987

Now read it again and think of yourself as a teacher. Once you get to the cutting edge of your competence, you'll learn a funny thing. The "cutting edge of your competence" is elastic and can be stretched, and you can become even more competent and an even more effective teacher.

Call for Manuscripts

Topics:

GPS implementation manuscripts are needed. For example, instructional strategies to teach GPS, GPS implementation issues, working with special populations in a GPS environment and sample student task solutions are some of the ideas of interest.

Teaching Tips Ideas:

Share with your fellow teachers a pearl of instruction or assessment wisdom you have used in your classroom. Topics include how to design and implement effective warm-ups, strategies for implementing journal writing, etc. Manuscripts published in this section are typically one page in length.

Executive Director's Report

by *Becky King*
Executive Director
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PLU Update

During the 50th Annual Georgia Mathematics Conference last October, 220 teachers began the process required to complete one Performance Learning Unit. At the end of the conference 160 of the original 220 attendees turned in the on-site form and received the final form to be used for redelivery in their home school. The deadline for returning the redelivery form was December 31, 2009. As of February 15, 2010, only 43 have completed the PLU.

To the other 117: If you want GCTM to certify your PLU credit, please return the completed redelivery form ASAP!

If you have any questions, please contact Becky King at bwking@comcast.net.

GCTM Mission Statement

The mission of the Georgia Council of Teachers of Mathematics is to

- promote a high quality mathematics education for all students, encourage an active interest in mathematics and in mathematics education,
- promote ongoing professional development for mathematics education, and
- promote and reward excellence in the teaching of mathematics in the state of Georgia.

The objectives of the Georgia Council of Teachers of Mathematics are to encourage an active interest in mathematics and to act as an advocate for the improvement of mathematics education at all levels.

The Georgia Council of Teachers of Mathematics supports and encourages donations to the [Georgia Mathematics Education Trust](#).

GCTM NEWS



Membership Report

by Susan Craig
Membership Director
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Membership Matters

We are now surrounded by springtime CRCT, EOCT, and AP exams, fidgety students ready for the end of the school year, and our own spirits eager for the end-of-the-year tasks to be completed. The ending of an academic year is a blessing to educators. We have the opportunity to see completion for a class of students, to reflect on those things that were successful or not, and to plan for a new group – all with the resolution to continually improve our performance.

So spring into action and let us make similar resolutions

- to make GCTM even better and larger and to improve our own participation.
- to invite a new or veteran teacher to join us, testifying to them of the benefits of membership.
- to volunteer to serve as a leader in GCTM. Involving more members infuses us with new ideas and enthusiasm.
- keep GCTM informed of address changes. Returned mail is costly.
- contribute to GMET, GCTM's education trust which offers grants and awards to GCTM members.

As always, send information and questions to Susan Craig at secddc@aol.com

Have a wonderful spring and summer!

Learn More About Your Organization

www.gctm.org

- * Grants and Award Information
- * Membership Renewal
- * Mathematics Competitions
- * Previous *Reflections* Issues
- * Other



Proposed Change to GCTM Constitution

Term of Regional Representatives

Currently:

The regional representatives shall each serve a two-year term. The regional representatives are appointed.

Proposed:

Each region will have two region representatives who will each serve a four year term. One Region Representative will be appointed in year n and the other in year $n+2$.

Rationale:

Adding a region representative and lengthening and staggering the terms of the two region representatives will help with continuity and the potential impact of the region representatives.



GCTM Awards

GCTM Awards

Do you know a mathematics educator who deserves to be honored?

Go to Grants and Awards at gctm.org and follow the instructions for nominating an outstanding educator.

Each year, GCTM sponsors five awards that are presented at the Georgia Math Conference at Rock Eagle in October:

Gladys M. Thomason Award for Distinguished Service

This award is given for distinguished service in the field of mathematics education at the local, regional, and state levels, where the service is significant, is beyond normal job requirements, and is primarily for the improvement of mathematics instruction.

Awards for Excellence in the Teaching of Mathematics

Three awards, one each for elementary, middle, and secondary levels, are given to excellent teachers who have strong content foundation in mathematics appropriate for their teaching level, show evidence of growth in the teaching of mathematics, and show evidence of professional involvement in GCTM and NCTM.

Teacher of Promise Award

GCTM recognizes one outstanding new teacher in the state each year who has no more than 3 years experience at the time of the nomination and who demonstrates qualities of excellence in the teaching of mathematics.

John Neff Award

This award is presented to a member of GCTM who demonstrates excellence as a full time post secondary educator and/or district supervisor. The recipient is someone who is an inspirer, a mentor, and an advocate of mathematics and mathematics education.

Dwight Love Award

This award is presented to a teacher in Georgia who models excellence in the profession and in life and gives much to others beyond the classroom as mentor, teacher and leader. The awardee is a master teacher, professionally active, and promotes GCTM and its mission.



CALL FOR *REFLECTIONS* EDITOR!

If you have an interest in becoming the next *Reflections* Editor, please contact Gregory Chamblee, gchamblee@georgiasouthern.edu for additional information.

Call for Speaker Proposals

Georgia Mathematics Conference

Go to www.gctm.org and click on the proposal link on the homepage.

Teaching Tip

by John A. Fulgham
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Conceptual Development: Division of Fractions

Everyone knows how to solve a problem like $3/4 \div 5/6$. Just invert the fraction on the right side of the problem and multiply. Simple. No problem. Unfortunately, this simple trick for solving problems involving division of fractions gives no clue as to the reason for this inversion.

As educators we know that understanding the meaning of a concept is crucial to remembering it. To assist with the goal of “remembering the concept,” research supports the use of manipulatives. While manipulative based models for addition, subtraction, and multiplication of fractions are easy to find and equally easy to use in developing understanding of the rules for computation with fractions, the same cannot be said for working with division of fractions. The following is an effective technique for developing an understanding of the “invert and multiply” rule using Unifix Cubes to help students conceptualize the “invert and multiply” rule.

Before beginning to use the Unifix Cubes, students must understand the following concepts:

1. The meaning of multiplication. For example, 3×5 means three groups of five members.
2. The numerator of a fraction represents the number of parts being considered in the whole.
3. The denominator represents the total number of parts in the whole.
4. A fraction with the same numerator and denominator equals one whole; $4/4 = 1$.
5. Multiplication of fractions.
6. Division as repeated subtraction.

Instructional Strategy

In step one of the lesson, ask the students if anyone has ever shared a pizza with someone else. Get a variety of responses from the students showing into how many parts the pizza was divided. Let's say the student says the pizza was divided into 6 pieces. Write 6 on the board. Discuss that there are 6 pieces thus the whole is 6. Since no one has eaten a piece of the pizza, we are considering 6 pieces. Therefore, $6/6$ represents the whole pizza or 1 pizza. Repeat with two or more of these familiar examples and then move the Unifix Cubes which are a more abstract representation. Demonstrate a few more of the pizza examples in order to review with the students

that when the numerator and denominator are the same, the fraction equals one.

Next have the students represent the following with the cubes.

$$3/3 = 1$$

$$7/7 = 1$$

$$5/5 = 1$$

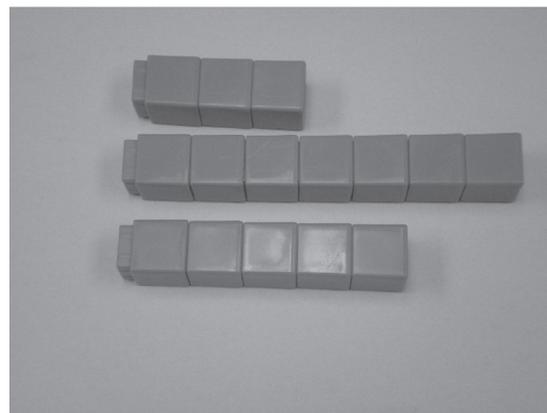


Figure 1

Continue having students use the cubes to represent fractions that equal one whole until they can easily represent equivalents to one with ease and can name an individual cube as, for example, one-third, one-seventh, one-fifth.

When students are able to show unitary fractions easily, in Step 2 of the lesson show the students how to use the cubes to show a whole number divided by a unitary fraction. Demonstrate how to use the cubes to show three divided by one-third. At this point it is sometimes helpful to represent the problems as $3 \div 1/3$ (this should look like a traditional whole number division problem). Read the problem as “how many groups of $1/3$ are there in three. In addition, it is helpful to remind students that this is a kind of repeated subtraction problem. In this way, students can see that the three tells how many groups are to be divided; $1/3$ tells how much must be subtracted each time. So to make the subtraction easy, each of the wholes is shown as three-thirds.

Represent the three wholes as three stacks of three cubes connected as shown.



Figure 2a

Emphasize that each individual cube represents one-third of the whole.

We have three stacks of three. We now want to see how many groups of $1/3$ we can subtract from three. Break the cubes apart so that each part is $1/3$. You now have 9 individual cubes.

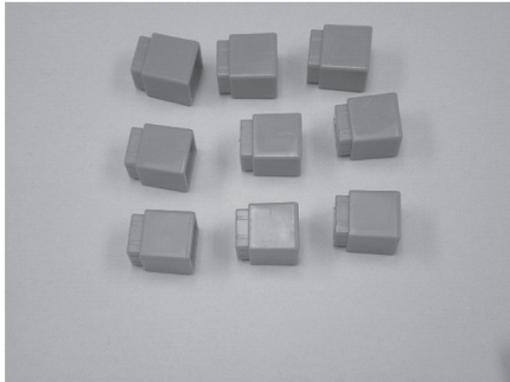


Figure 2b

Therefore, 3 divided by $1/3$ equals 9. Write the problem on the board: $3 \div 1/3 = 9$

Demonstrate other examples such as (A) $2 \div 1/2$. Represent the two stacks as shown.

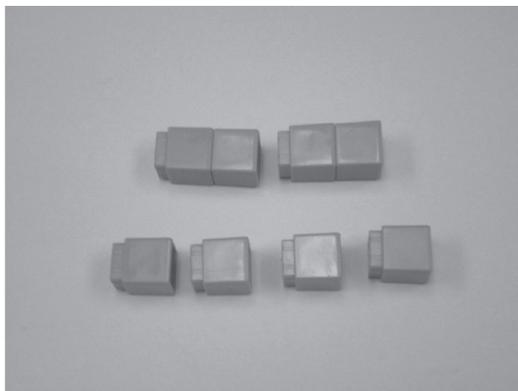


Figure 3

Break (divide) the stacks into $1/2$ as shown. (See figure 3).

You have 4 individual cubes. Thus, 2 divided by $1/2$ equals 4. Write the problem on the board: $2 \div 1/2 = 4$

Demonstrate other examples such as (B) $7 \div 1/4$. Represent the 7 stacks as shown.

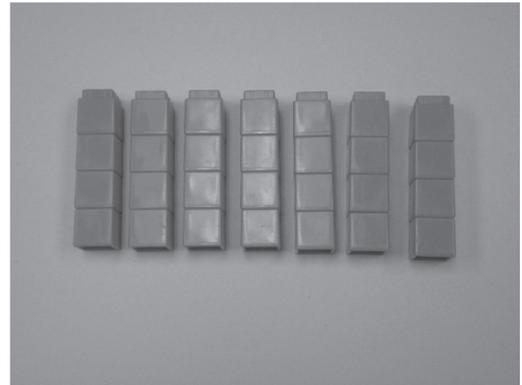


Figure 4a

Break (divide) the stacks into $1/4$ as shown. You have 28 individual cubes. Thus, 7 divided by $1/4$ equals 28.

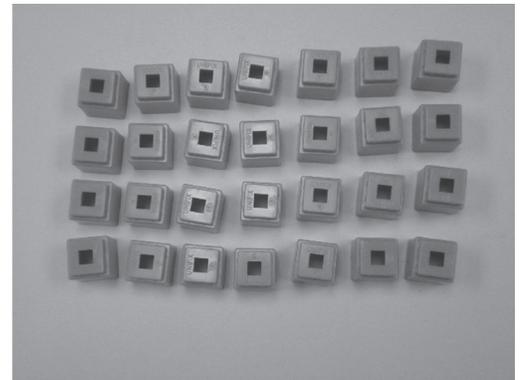


Figure 4b

Write the problem on the board: $7 \div 1/4 = 28$.

In step three, have the students use the cubes to work some problems in which a whole number is divided by a unit fraction.

Some examples are:

$$\begin{array}{ll} 5 \div 1/9 & 8 \div 1/5 \\ 4 \div 1/6 & 7 \div 1/4 \end{array}$$

As each problem is demonstrated either by you or the students, write the problem on the board. Ask the students if they see a pattern that will help them remember how to divided fractions. Discuss with them their ideas; lead them into discovering that you can multiply the whole number by the denominator and that the denominator remains the same. DO NOT state the rule for division of fractions.

Next demonstrate how to divide a whole number by a non-unit fraction. Again as you demonstrate, write the problem on the board.

Following are examples of how to demonstrate a whole number divided by a non-unit fraction:

$$5 \div 3/7: \text{ Make 5 stacks of 7 cubes each.}$$



Figure 5a

Remind the students that the 7 tells how many are in the whole. The 5 tells how many groups. To show the repeated subtraction, continually break the 5 stacks into groups of 3 since the 3 tells how many parts you are considering. You will have 35 Unifix Cubes connected in groups of three.

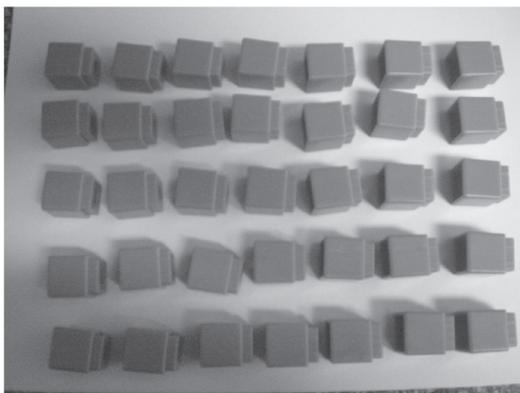


Figure 5b

Count the cubes. There are a total of 35 cubes. The new whole is 3. Therefore, the answer to $5 \div 3/7$ is $35/3$.

Write the problem on the board: $5 \div 3/7 = 35/3$

Another example: $3 \div 2/4$

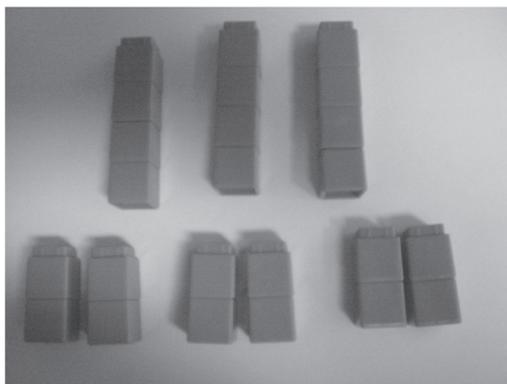


Figure 6

Make 3 stacks of 4 in each stack. Remind the students that the 4 tells how many are in the whole. The 3 tells how many stacks. To show the repeated subtraction, continually break the 3 stacks into groups of 2 since the 3 tells how many parts are being considered. You now have 12 Unifix Cubes connected in stacks of 2 (see figure 6). The new whole is 2. Therefore, the answer to $3 \div 2/4$ is $12/2$. Write the problem on the board: $3 \div 2/4 = 12/2$.

Have the students use the cubes to work some problems in which a whole number is divided by a non-unit fraction.

Some examples are:

$$5 \div 2/9 \quad 8 \div 3/5 \quad 4 \div 4/6 \quad 7 \div 2/3$$

As each problem is demonstrated either by you or the students, write the problem on the board. Ask the students if they see a pattern that will help them remember how to divide fractions. Discuss their ideas and lead them into discovering that you can multiply the whole number by the denominator to get the answer and the numerator becomes the new denominator.

As students work with the unit and non-unit fractions, they should discover the rule for dividing fractions:

To divide fractions, you invert (flip) the fraction on the right (divisor) and follow the rule for multiplying fractions: you multiply the numerators; multiply the denominators.

After the students have discovered the rule for dividing fractions and students have worked many problems dividing fractions. Introduce the term “reciprocal.” When you flip or invert the fraction, you have a reciprocal of the original fraction. Example: the reciprocal of $3/4$ is $4/3$.

The reason we invert (form the reciprocal of) the end fraction is because any number multiplied by its reciprocal is equal to 1. $3/4 \times 4/3 = 1$

When a fraction is divided by another fraction, the result is a complex fraction (see below). To simplify the complex fraction, we multiply the numerator and the denominator by the denominator’s reciprocal. See the example below. This results in a multiplication problem.

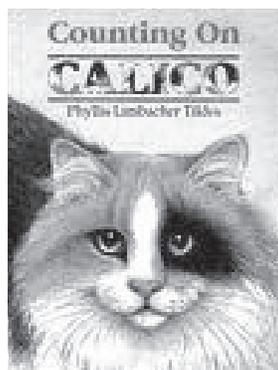
$$\frac{3/4}{2/5} = \frac{3/4 \times 5/2}{2/5 \times 5/2} = \frac{3/4 \times 5/2}{1} = \frac{15}{8}$$

Therefore, it is much simpler for students to learn the rule of dividing fractions. To solve $3/4$ divided by $2/5$, turn the problem into multiplication by forming the reciprocal of $2/5$. The problem becomes $3/4 \times 5/2$ which equals $15/8$.

As previously stated, students can better remember a concept when they visualize the idea through using manipulatives. Using Unifix cubes is an excellent method to help students conceptualize the “invert and multiply” rule when dividing fractions.

Books That Make Good Math Even Better

Are you looking for a good math literature book to help introduce your math vocabulary? Or maybe you want to demonstrate how a concept relates to real life. Do you need a good lead-in to the concept? There just seems to be an endless supply of math literature books out there, and I love sharing them with you. I've said it before and I'll say it again, nothing starts a math lesson any better than a math literature book. It also gives you a chance to introduce and reinforce math content vocabulary. Books can also serve as a springboard for writing activities. But enough of that, let's look at some books.



Counting On Calico by Phyllis Limbacher Tildes (Scholastic, Inc. 1995) offers a look at counting and some interesting cat facts. It begins with 1 tail and then provides information about the cat's tail, such as using it for balance. And a twitching tail means a cat is angry or getting ready to pounce. It provides counting and cat trivia from 1-20. The pictures are soft and very realistic. This book could be followed

up by letting children write their own book about another animal such as dogs, horses, mice, etc. This could be done as a class or individually. Younger ones could dictate their stories to someone. Share the books and practice counting.

If you are working on time and distance, here is a marvelous book to bring the concepts to life. Amy Axelrod has written several books in her Pig series and her sixth one is **Pigs On the Move: Fun with Math and Travel** (1999, Simon & Schuster Books for Young



Readers). If you are familiar with Axelrod's Pig books you know that they are all funny, colorful, and full of misadventures. In this one, the Pig family is going on vacation. But they miss their flight and have to zigzag across the country moving in and out of time zones. Be sure you read this to your students for

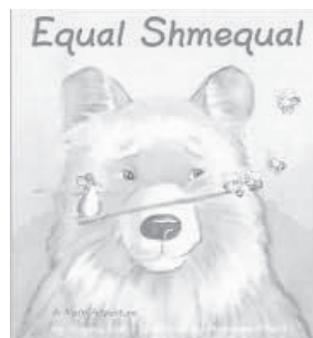
the pure enjoyment of it before you begin looking for the math. As an extra for teachers or parents, there's a page discussing time zones and distance. You will also find some elapsed time word problems with time zone changes for the older students. Students can also do map reading with this book. For older students, have them find the names of the cities with nicknames on the map, such as Big T OK, City of Roses, OR. or Frog Town, OH. Have students write simple time problems, such as, "If you leave Music City at 9:00am, and it takes 4 hours to fly to the City of Angels, what time will it be when you get there?" Whether you use this book with elapsed time, map reading, or time zones, just be sure to read it. It's great!



For your younger students (K-2) **Just a Minute!** By Teddy Slater (1996, Scholastic) provides students with an entertaining look at time. As you begin to learn about units of time, this book would be a good way to introduce the unit of a minute. Following the story Marilyn Burns offers some activities that can be done at school or at home. Once you've read the story, follow up by having the class estimate how many minutes it takes

to do various activities, such as spell their full name, count to 20, recite the alphabet, etc. Or have the class make a list of things that take about a minute to do. Whatever you choose to do, this book is of a minute.

If you are discussing what "equal" means, don't miss the book **Equal Shmequal** by Virginia Kroll. (2005 Charlesbridge) This story begins with students making equal teams for some outdoor games and relays. Soon the animals see them and decide to try some of their own. They get into discussions of what is equal. The book is cute and can lead to class discussions of what is equal in different situations. The last page talks about what is equal in math, in sports, in law



and in art. This is a good book for exploring the meaning of equal. You could follow-up with problems on cards for students to explain whether the two sides are equal or not.

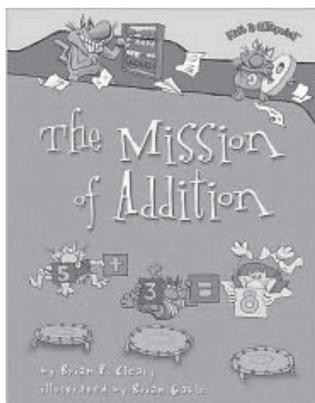


Everybody Wins! By Sheila Bruce (2001 The Kane Press) is part of the Math Matters series for grades 1-3. In this book Oscar was eating lunch and read about a contest. The winner gets 100 frozen pizzas. The book explores how Oscar works to get the box tops he needs to enter and the deals he makes with his friends to get those tops. It's a good look at why division is important and how it applies to

everyday experiences. This is another book that offers activities at the end relating to division. As a follow-up, have students write word problems and illustrate them.

How many of you have teddy bear counters in your classroom? Now there's a new book to go with them. **Teddy Bear Counting** by Barbara Barbieri McGrath (2010 Charlesbridge) gives students a look at colors, numbers from zero to twelve, and basic shapes. The book is in rhythmic text and very appealing to young children. For a change of pace, use gummy bears rather than teddy bear counters to replicate the pages in the book. Students can also illustrate what they see or make up simple problems and illustrate them.

If you are familiar with the Words Are Categorical series of books, Brian Cleary now has a new series entitled Math is Categorical. **The Mission of Addition** by Brian Cleary (2007 First Avenue Editions) is one of the books in this series. The illustrations in this book are just wonderful. Students can see that manipulatives are more than cubes, bears, or straws. They can be cats, dogs, hoops or more.



Children will love this book. It is full of life, full of color and loads of fun. They see that addition is joining smaller groups and making them into larger groups. The possibilities for extensions following this book are plentiful. Students could make their own version of the book to share with others in the class. They could also act out problems. The book sets out to illustrate what addition never gets smaller and does a great job of it. However, with everything on the pages and it's relatively smaller size, this book is a little difficult to share with a big group. Hopefully, it will be published as a big book one day. Other books in the series include The Action of Subtraction, How Long or How Wide, and On a Scale, a Weighty Tale.



If You Were a Plus Sign by Trisha Speed Shaskan (2008 Coughlan Publ.) is part of the Math Fun Series for 4-8 year olds. Hilarious pictures make learning and laughter equal elements of this book. There are animals like polar bears, tigers, and seals all showing what a

plus sign can do and what it means. Here's another book that focuses on vocabulary and the meaning of the sign. For students struggling with math content vocabulary, this book and the other five books of this series, will be very helpful in seeing what these terms mean. **If You Were a Plus Sign** will be a plus in any math literature library. The whole set would be.

I hope you've found something new to add to your collection. If you have a new book you'd like me to share with others, please email it to me for inclusion in future columns.

Until next time, keep reading that math!

Reflections Purpose

Reflections, an official publication of the Georgia Council of Teachers of Mathematics, serves as a resource to inform the membership of Council activities and provide resources to enhance the teaching and learning of mathematics in Georgia.

Making Mathematics FUN

Dr. Rock's Math Mystery

by David Rock
Columbus State University
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Elementary Brain Teaser

From Last Issue

My House

My house has a number.

- 1) If my house number is a multiple of three, then it is a number from 50 through 59.
- 2) If my house number is not a multiple of 4, then it is a number from 60 through 69.
- 3) If my house number is not a multiple of 6, then it is a number from 70 through 79.

What is my house number?

My House Solution: 76.

Suppose my house number is a multiple of three. Then, from 1, it is 51, 54, or 57. But, from 2, it cannot be any of these numbers because none is a multiple of 4. So my house number is not a multiple of three. Then my house is not a multiple of 6 because a multiple of 6 is a multiple of 3. So, from 3, it is a number from 70 through 79. Then, because it is not a multiple of three, it is 70, 71, 73, 74, 76, 77, or 79. Then, from 2, it cannot be "not a multiple of 4". Then my house number is 76, because it is either 70, 71, 73, 74, 76, 77, or 79, and of these only 76 is a multiple of 4.

New One!

Sneaky Series

Find the next two number in the pattern below:

9, 18, 11, 16, 13, 14, 15, 12, 17, 10, ____, ____

Challenge Round

From Last Issue

Two, Three, Five

One is the smallest nonzero integer that is a perfect square, cube, and fifth power. What is the next smallest integer with this same unique property?

Two, Three, Five Solution: 1,073,741,824.

In the factorization of a perfect n th power, each prime factor has an exponent divisible by n . Also, if a number is a square, cube, and fifth power, every prime factor has an exponent divisible by the LCM of $2, 3, 5 = 30$. Thus, the number is a perfect 30th power and the second smallest such number is $2^{30} = 1,073,741,824$

New One!

Four Digit Miracle

Find a positive four digit number with different digits such that: the difference of the four digit number with its digits arranged from greatest to least and arranged from least to greatest is equal to the original four digit number.



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October 13-15, 2010

NCTM Regional Conference

New Orleans, LA

October 28-29, 2010

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Atlanta, GA

November 3-5, 2010