

KY MATH SMART

STRATEGIES, MANIPULATIVES, ASSESSMENT, RESOURCES
AND TECHNOLOGY FOR KENTUCKY'S MATH EDUCATORS

VOLUME 1 EDITION 2

JANUARY 2008

Edited by Karen Campbell—River Region (karen.campbell@daviess.kyschools.us)

Don't forget:

- *National Math Recovery Conference in Newport, KY April 15-18, 2008.*
- *NCTM Annual Meeting and Exposition, Salt Lake City, UT April 9-12, 2008*

Ky. Primary Mathematics Intervention Initiative Sees Major Gains in First Year from Gwen Morgan

The Kentucky Center for Mathematics (KCM) released surprising statistics from the first year of its Primary Mathematics Intervention Initiative that show the program is working better than anyone could have expected. Last year, more than 1,000 kindergarten and first-grade mathematics students at 45 schools throughout the Commonwealth received specialized instruction from full-time primary Mathematics Intervention teachers. State-wide, students who received the specialized instruction significantly outperformed their peers. Kindergarteners finished the year scoring higher than 64 percent of all students nationally, whereas their peers who did not receive the specialized instruction scored higher than only 36 percent of all students. Equally impressive, first-graders who were part of the program scored higher than 49 percent of all students. Considering that these students started the year scoring higher than only 7-8 percent of all students, the gains are dramatic.

“We couldn't be more

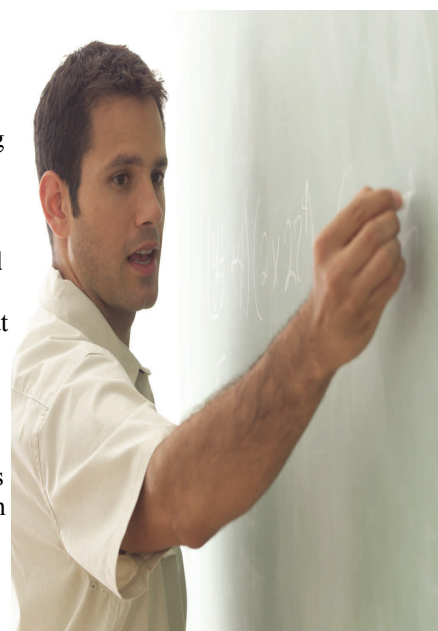
pleased with these results,” said Alice Gabbard, KCM director of diagnostic intervention. “To see that the Mathematics Intervention Initiative is having such a strong and immediate impact is extremely encouraging. We hope for continued support to sustain this program because it is desperately needed for building a foundation in numeracy that will allow all Kentucky students to excel.” Early numeracy benefits children by establishing foundational concepts and skills and also provides them with greater confidence in their abilities to think and to explain their thinking. Staff members at the KCM, which is housed at Northern Kentucky University, coordinate the training for the Mathematics Intervention teachers. Jonathan Thomas, assistant director of diagnostic intervention at the KCM said there is a great need for time and attention to be dedicated to young students, because there is a wide-spread misconception that first-grade math is easy.

“The KCM provides training and support to allow teachers to learn and engage in ongoing discussions

about the complexities of teaching primary mathematics,” he said. “One of the goals of teacher training is awareness of specifically what a child understands. For example, when a child looks at the numeral 12 and says ‘twelve,’ does the child just see a squiggle that matches the word? Does he understand that 12 is ten and two or think that it is a one and a two? Is the child able to think about the parts within the 12, such as seven and five? Understanding exactly how children think allows teachers to provide the most effective instruction.”

Forty-Five Mathematics Intervention teachers were funded for two years by the Kentucky Department of Education. Another 41 teachers received two years of funding beginning in the 2007-08 school year and an additional 40 schools will receive two-year grants beginning in the 2008-09 school year.

For more information, contact Kentucky Center for Mathematics Assistant Director of Intervention Jonathan Thomas at thomasj13@nku.edu.



Inside this issue:

Strategies	2
Manipulatives	2
Assessment	2
Resources	3
Technology	3
Response Strategy for Student Success with OR	3
Literature Math Connection	4

KY MATH SMART

STRATEGIES

Multiplication tables— forbidden or embraced? Where do you stand? This just might change your mind.

For just a little while, let's look beyond the traditional use. Multiplication tables can be used for skip counting long before they are used for multiplication.

They can be used to find the least common multiple of 2 numbers. Find their intersection on the table and mark that number. That is a multi-

ple. To find if it is the least look up the column and back the row to see if there is another number in that column and row in common that is lower. 5 and 6 intersect at 30 and there are no other similar numbers so 30 is the LCM. 10 and 8 intersect at 80, but 40 is also in the row and column so 40 is the LCM.

To find the Greatest Common Factor find the least of two numbers in the grid, look down the column or to the right in the row to find the

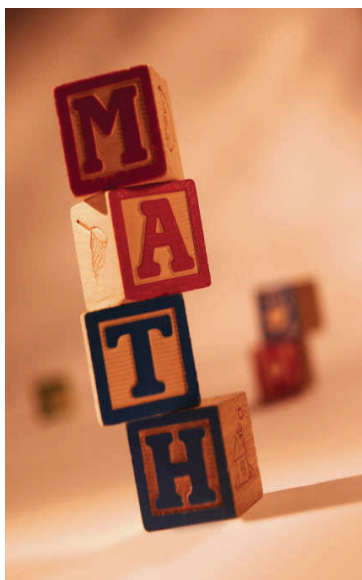
other number. If they share the row, the GCF will be the first number in the row, if they share the column the GCF will be at the top of the column. 12 and 18 are both in the "6 row" so 6 is the GCF.

Finally, the table can be used to reduce fractions! Find the numerator and denominator in the same column. Follow those two rows to the left. With larger numbers you may have to do this again. $72/88$ can be found in the "8 col-



umn". Following to the left it reduces to $9/11$. $72/90$ goes back to $8/10$. To make sure it is in lowest terms, find an 8 with 10 in the same column. It can be found in the "2 column" so $8/10$ reduces to $4/5$. Since that combination is only found in the "1 column" it is in lowest terms.

Maybe the often maligned multiplication table is about to make a come back in your classroom.



MANIPULATIVES

Games, games and more games! Think back to your own childhood when games of all types filled long winter evenings—board games, card games and more. I remember my mother playing solitaire every morning with her coffee and watching her I learned how to count backward and forward. Playing War with Grandma I learned that 10 was greater than 6. Playing Candyland I learned counting, colors and cooperation.

Dig those old games out and look for new ones to add to your classroom collection. Some of my high school students' favorite math related games included *Uno*, *Make 7*, and *Set*. I recently added several dice games to my collection. *Math Dice* (www.ThinkFun.com) can be played in primary classrooms all the way through advanced algebra classes! *Farkel* is similar to *Yahtzee*, an all time favorite. I was recently reintroduced to an oldie, but goodie

that I had forgotten about—*Rummikub*. *Shut the Box* is another oldie to rediscover. All of these games reinforce Numeracy skills and with a little work, much more. For example, what is the probability of rolling a yahtzee? Check out new games such as *Are you Smarter than a Fifth Grader* and *Big Brain Academy*. Both include math activities, especially mental math. Plunge the depths of your game closet for unforgotten gems just waiting to prove themselves in your classroom.

ASSESSMENT—'TIS THE SEASON? FROM LIZ BREWER

Yes- we've made it through the holiday season and now we are focusing on the upcoming testing window, April 21- May 2, 2008. As you know our assessment is made of two types of questions: Multiple Choice and Open Response. Open response (OR) items require students to both demonstrate content knowledge and to apply that knowledge in some way. Students utilize their con-

tent knowledge to successfully support their answers to communicate clearly what they know and are able to do. These items allow for more depth of knowledge to be demonstrated than in the multiple choice items. Students can be asked to demonstrate more cognitive skills such as comparing, relating, analyzing, inferring, concluding, predicting, generalizing solving and/or applying.

RESPONSE Strategy for Student Success in OR Questions is a quick mnemonic to help students make sure they've done their best. See page 3 for details. Remind students to always answer all questions. Give each one their best answer, even if they do not think they have much to say. Many teachers are already familiar with and utilize the assessment information from KDE, the Massachusetts De-

partment of Education and the Clark Co Public School websites. If you haven't checked them out recently, take time to go there now. Here are their links and a few others to use as you prepare your students. Kentucky Dept. of Education website: www.kde.state.ky.us has released open response items & the Office of Teaching & Learning has created "Developing Quality Open Response and Multiple Choice Items for the Classroom". Both of these items (continued on page 4)



Take time to go through files, book cases, and storage closets. It's amazing how many things can be thrown away, but also how many forgotten gems you will find.

RESOURCES

Did you make a New Year's Resolution to get organized? To get fit? Don't forget your classroom. If your classroom is like mine was, it is in desperate need of an organization and fitness plan. Cleaning out a file cabinet doesn't have to be a summer activity. Grab a mug of your favorite latte or hot chocolate and dig in. Don't think of it as cleaning; think of it as exploring!

Just go through one drawer, one shelf, or one folder on your computer and you will

be amazed by the resources you have sitting right in your classroom! We all found, bought or created the perfect activity/lesson/manipulative in the past. Used it; stored it and then forgot about it. There is a new student sitting in your class who can benefit from what is stored away. Instead of starting from scratch, there is something there you can tweak in just a matter of minutes and voila, the perfect materials.

Maybe it is a book you bought

at a conference 3 years ago that has sat forgotten on the shelf or the list of websites that colleagues have forwarded. Take the time to rediscover them, use them, organize them so they can be found and finally, share them. We are our greatest resource. We know what works and what doesn't. Make it a point to include a mini-share session at each department meeting. There is a wealth of resources right in your own building.

TECHNOLOGY

Did you see the commercials before Christmas for the Fly Fusion Pentop Computer? Don't write this one off as another gimmick for the kids. There is power in the pen! Are you familiar with the student in your class who rarely does his or her math homework because when they get home they don't remember how to do it?

The Fly Pen will walk them through the steps in adding fractions, solving an equation, solving systems of equations and much more! As with most technology there is a learning curve involved and some students might not be patient enough to use it. The major drawback is that you have to use

their notebooks and they are expensive (about \$8 each).

Additional software may be purchased online or look for the online subscription that allows you to download anything for one year. The Algebra software includes a built in talking glossary so help when the teacher is not around is literally available at the touch of a pen. Special note: because of the glossary, this would not be an appropriate technology based modification for Kentucky state assessment since it does include content. But don't shy away from

using it with a student early in the learning process; just remember to work on weaning them off of it as their skills improve and their confidence increases.

Students will quickly realize that this is more than a tool for math. The notes they write in the Fly notebook can be transferred to their computer. The built in organizer could help some of our disorganized students stay on top of everything—even homework! Best yet, the built in MP3 player just might keep them focused on their work for a little longer.

Check it out at www.flyworld.com.

RESPONSE STRATEGY FOR STUDENT SUCCESS IN OPEN RESPONSE QUESTIONS

Read the question quickly, and then re-read looking for specifics

Everything that you are given should be read before starting to answer (charts, graphs, maps, etc.)

Specific key words and ideas in the question should be underlined. Look for direction words or verbs.

Parts—make sure all parts of the question are an-

swered. Look for signals such as "A and B" or the word "and".

Organize your thoughts to the answer quickly. Use the graphic organizer you practiced in class.

Note any key vocabulary words or ideas that you want to include. Remember to use your math terms.

Support your answers with facts and figures. Show the

problem solving steps taken, such as calculations, charts, and graphs. Remember to practice with a calculator daily—you CAN use it for OR questions.

Edit and revise your answer. You need to make sure that the scorers can understand what you mean.

Finally, remember to practice OR frequently and provide instructive and timely feedback.



Kentucky's Special Education Cooperative Math Consultants

Kentucky's Special Education Cooperative Math Consultants are here to serve you. Contact your district's Director of Special Education if you need assistance from a math consultant. The math consultants and math contacts for each Cooperative are listed below.

Tammy Wall—**Big East Educational Cooperative**

Liz Brewer—**Cavland Educational Cooperative**

John Beardsley—**Central Kentucky Cooperative**

Connie Wilson—**Jefferson County Exceptional Child Educational Services**

Gwen Morgan—**Kentucky Valley Cooperative**

Marinell Kephart—**Northern Kentucky Cooperative**

Carrie Bearden—**Ohio Valley Cooperative**

Karen Campbell—**River Region Cooperative**

Cheryl Lancaster—**Western Kentucky Cooperative**

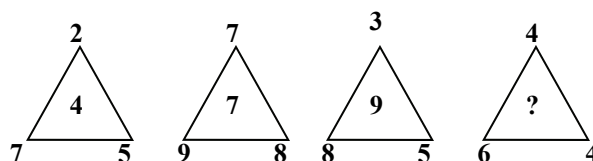
Belinda Bowling—**Wilderness Trail Cooperative**

Connie Brookins—**Upper Cumberland Cooperative**

Connie Hunt—**Upper Cumberland Cooperative**

Student Challenge

Discover what number goes inside the last triangle, by adding, subtracting, multiplying or dividing the other numbers. All triangles follow the same pattern. Challenge students to create their own triangle puzzles!



LITERATURE/MATH CONNECTION

How Big is a Million? There isn't anything much cuter than a penguin and Pipkin the penguin wants to know just how big is a million. He finds 10 fish, one hundred penguins and a thousand snowflakes but heads home without finding the answer to his question. His mother finally shows him a million. The answer is found on a large—very large—poster tucked in an envelope in the back of the book!

The drawings in this book by Anna Milbourne and Serena

Riglietti are whimsical, creative and are the perfect antidote for a cold winter day. Don't write this off thinking it is another book for only younger children. Even high school students love penguins and they can practice estimating by counting the number of stars in a square centimeter or square inch and then multiplying for the entire page or poster. They can figure the percent of the page covered by snowflakes. You might not read it a million times, but you might hear a million "ahs".



Algebra has the power to be radical!

Assessment—continued

can be found under the "Teaching Tools Section". **Massachusetts Comprehensive Assessment System Released Open Response Items Grades 3-10** <http://www.doe.mass.edu/mcas/student/> This site provides the released Open Response items, Scoring Guides and Sample Student Responses from the Massachusetts Department of Education. Their standards are closely related to ours.

Clark County Public Education System Open Response Catalog Grades K-12

<http://teach.clarkschools.net/curriculumresources>

This site provides Open Response items and Scoring Guides for numerous subject areas including mathematics.

SW Georgia RESA Grades 9-12

<http://www.sw-georgia.resa.k12.ga.us/Math.html>

Graphic Organizers, power points and other teacher resources

Remember students will write their answers on graph paper. Please provide them with practice time. A free graph paper website is <http://incompetech.com/beta/plaingraphpaper>

