



## Message from the President

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### Are You Using a Rehashed, or Rethought, Curricula to Teach the Common Core?

While attending a meeting in late 2010, I learned that at least one of the authors (Dr. Phil Daro) of the Common Core intended for educators to rethink the ways in which mathematics was to be taught, upon adoption of the standards. In fact, Dr. Daro made it clear that the worst outcome imaginable would be a rehashing of existing curricula, meaning a rearrangement of our existing resources with slight, if any, modifications. Unfortunately, too many PD experiences across our state have focused on rehashing, rather than rethinking.

Research-informed rethinking of curricula takes a great deal of time and effort, which is why we asked you, and other Kentucky educators via our fall/ winter survey, what content KCTM should help you rethink? In response to your feedback, we decided to focus on Ratios and Proportions, a topic that takes center stage in the middle grades, but is a continuation of ideas learned in intermediate grades mathematics, and the foundation for making sense of mathematical relationships between quantities with a constant rate of change.

KCTM has organized its first ever electronic and interactive PD beginning February 6th. The PD will occur over three evening sessions and use NCTM's Developing Essential Understanding text on Ratios, Proportions, and Proportional Reasoning. For further information, and to register, please [click here](#).

While we aren't sure if you have been through PD experiences of rehashing or rethinking in the past, we promise you that participation in our ePD will equip you with the tools to rethink your available resources, so that you can confidently teach the Common Core Standards on Ratio and Proportion in the ways they were meant to be taught.

#### Seth Hunter

Math Specialist | Ohio Valley Educational Cooperative | Kentucky Department of Education  
KCTM President

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# KCTM Annual Conference Update, Julie Dunn, KCTM President-Elect

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The 2011 KCTM Annual Conference in Bowling Green was a great success!



**Dan Meyer**, our featured speaker, enlightened attendees in the importance of challenging our students in his talk entitled *Math Class Makeover*. You can see Dan present a TED Talk here:

<http://www.youtube.com/watch?v=BlvKWEvKSi8>



This year was the first year for KCTM to exhibit **NCTM resources** including samples of top selling educational materials and special products at 30% off the original cost as a benefit for attending the conference. The special orders were shipped from NCTM directly to the purchaser. KCTM intends to continue this special promotion at future conferences.



One lucky conference attendee won a new **iPad** courtesy of KCTM!

**NEW Benefit for KCTM Members-** As a member of KCTM, you have exclusive access to **presentation resources** from our annual conference sessions. To view the electronic resources submitted by willing presenters, visit <http://www.kctm.org/Default.aspx?pagelid=1151610>.

Congratulations to the following **award recipients** from our annual conference banquet:

MESA Awards- Cindy Aossey, Traci Brown, Dr. Bethany Noblitt, & Julie Williams

PAEMST- Charles Rutledge III, Michelle Gross, Andrea Higdon, & Andrea O'Bryan

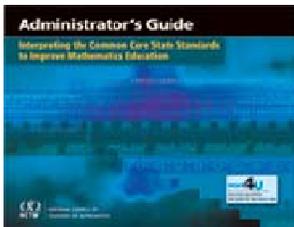
KCTM Classroom Teacher Support Grants- Marjorie Lellie & Bobbie Porter, Liz Popelka, Erin Schneider, & Craig Schroeder

The KCTM Board extends a **special thanks** to Renee Warren and the faculty, staff, and student volunteers of South Warren High School for hosting an outstanding conference.

**\*\*\*The 2012 KCTM Annual Conference will be held in Lexington. The date and site will be finalized soon. Information will be shared via email, Facebook, and [www.kctm.org](http://www.kctm.org).\*\*\***

## NCTM Update, Julie Dunn, KCTM President-Elect

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### NEW Book Updates NCTM's Administrator's Guide [Administrator's Guide: How to Interpret the Common Core State Standards to Improve Mathematics Education](#)

Written by NCTM Board member Matthew R. Larson, this important new book updates NCTM's *Administrator's Guide: How to Support and Improve Mathematics Education in Your School*. Additionally, the guide provides a blueprint for administrators to learn about the Common Core State Standards for Mathematics and how to support and improve mathematics education in their schools and districts. [More information...](#)



**A Plethora of Common Core Learning Opportunities in Philly** NCTM's [Philadelphia Annual Meeting](#) will offer attendees opportunities to hear dozens of presentations aligned with teaching the Common Core State Standards for Mathematics. The 2012 conference is where you'll learn the latest from experts on what these standards mean for your curriculum and your students. Use the [Online Conference Planner](#) to find the Common Core sessions for your grade level, and also search for other topics, like differentiated instruction, technology for mathematics, algebraic readiness, and more! Be sure to [register](#) by March 16, 2012, to save 36% or more with NCTM's lowest Early-Bird preregistration rates.

## Mathematics Education Trust

**Supporting Teachers ... Reaching Students ... Building Futures**

**Mission:** The Mathematics Education Trust (MET) channels the generosity of contributors through the creation and funding of grants, awards, honors, and other projects that support the improvement of mathematics teaching and learning. For more information or to apply for a MET grant, scholarship, or award, see [www.nctm.org/met](http://www.nctm.org/met).

## Kentucky Center for Mathematics

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The Kentucky Center for Mathematics will host its annual conference at the Hilton in downtown Lexington, KY on Thursday, March 8th and Friday, March 9th, 2012. As Kentucky educators continue to work hard on successful implementation of the Common Core State Standards for Mathematics, this event will be focused on Improving Mathematical Practices and will provide opportunities to learn from and network with others who are passionate and knowledgeable about mathematics education. For registration and presentation details, please see: <http://www.kymath.org/kcmc2012/>.

### Kelsey Ripley

Project Coordinator

The Kentucky Center for Mathematics



# Spotlight on Teaching



**Robyn Whelan** is the subject for the Middle School Teacher Spotlight. She is a veteran mathematics teacher from Louisville. Robyn began teaching mathematics in 1988 with the Catholic Archdiocese of Louisville. Later, Robyn taught for Jefferson County Public Schools at Stuart Middle School where she taught 6th, 7th, and 8th grade math. In 2008, Robyn was hired by JCPS to work with the math office as a full time Resource Teacher. She has worked with as many as 10 middle school math departments. This year she will work with Conway Middle School and Moore Middle School.

Robyn is more than just a support for math teachers she is a catalyst of change for math education. Perhaps it is her love of teaching that has helped her to set herself apart from others. She notes that her teaching career began when she was fourteen and became a dance instructor. Robyn notes, “Although the materials I am presenting have changed, the strategies for helping kids learn have not.” She received her Masters in Math Education from the University of Louisville and continues to read current research to hone her mathematical pedagogy. Below is Robyn in her own words. She truly is a great asset to our mathematics education family!

## **1. What is the favorite part of your job?**

The favorite part of my job is two-fold. When I get the opportunity to work with new teachers and I see their growth over a year or more it is exciting. When I first became a teacher I would get excited when my students would become independent learners and would gain the same passion that I have for Mathematics. Now I get that same excitement working with teachers and watching them gain confidence and becoming more independent.

## **2. What have you gained most from your teaching experience?**

A much deeper understanding of how students learn math. I will never stop growing in this area. I learn more and more each day. With the change in standards in Kentucky from 4.1 to KCAS we have changed the grade level that certain concepts are taught in, but we haven't changed the best practices for teaching mathematics and we haven't changed the basic understandings that can become stumbling blocks for some of our struggling students.

## **3. What advice would you give to new teachers?**

That being a teacher means that you will always be a student. Each year that I have been in education, my end of the year reflection always brings me to focus on one area that I would change. My focus has evolved from a very classroom centered change (i.e. a better way to keep track of student work, a better approach to formative assessment so that I could provide more intervention), to a focus that is broader. I want to know more about the way mathematics in our state and in our nation. We are all going through huge changes in adopting national standards and I am in the front lines of how we are dealing with this at JCPS but want to learn from my colleagues throughout the state.

## **4. What new research-based information are you using to drive your instruction?**

I love reading, and I have spent some time this summer reading Jon Saphier's, “The Skillful Teacher.” When I read an author's work that speaks to my beliefs I use this work to guide professional development that I present. In the last few years I have been interested in formative assessment, its uses and implications. Through the work of Rick Stiggins and Jan Chappius, I have encouraged teachers to be more focused with assessment and to always have a purpose for it. As my work becomes more intentional around how children learn mathematics and my awareness has increased of the need for intervention that can be done in the classroom, in a timely manner has increased, so has my search for meaningful research.

## **5. What do you feel is the greatest challenge that you feel math teachers are facing today?**

We as teachers have moved from curriculum-based teaching to standards-based teaching with a focus on mathematical practices. This is a new approach for many teachers and with this change comes the opportunity for individual preference in materials, assessments and interventions. I think there are many more independent decisions that teachers have to consider in their quest to move all children to mastery of KCAS.

Submitted by: **Jamie-Marie Wilder**, KCTM Middle School Vice-President

# CCSSM Through the Eyes of a Parent, Professor, and Student,

Leanne Faulkner

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Let me first explain how I can tell about the Common Core State Standards for Mathematics (CCSSM) through the different lenses. I teach all the mathematics education courses at Kentucky Wesleyan College. Yes really all of them; we are a small college and currently I am the only full time mathematics professor. Occasionally, I have gotten the opportunity to team teach the Methods courses for Math and Science, so I have been taking graduate education coursework through WKU. As a parent I have a third grader and a kindergartener.

To describe how the CCSSM has changed my courses I will concentrate on Mathematics for Elementary Teachers. The first year with the CCSSM influencing the pre-service teacher coursework, I had a serious surgery and was not able to fully get into redoing the courses. I inserted the standards into my old lectures and thought I would not have to make many changes. I did another overhaul in the summer cleaning up and reordering some of the material. After the fall's KCTM conference where I attended many wonderful sessions on the fraction progression throughout the elementary content, I realized that I was teaching the course in more theoretical terms than practical. What I mean was I taught it in the manner that made most sense to me a mathematician, than how children actually progress through early arithmetic. To me after whole numbers, you would teach negative numbers to finish the closure of subtraction, then fractions to finish the closure of division. But in a child's experience sharing a candy bar with two others and having to cut it into thirds comes much sooner than dealing with debits and credits. So midway through the semester I did the third overhaul of my lectures letting the grade level standards be my outline guide. Many of my students were not as excited as I was about fractions, but for some of them the light did come on and they responded to the need to see fractions as units of measure first and as a complete number not two separate parts. All my old content and manipulative work was still there though taught in the order that a child would come to understand it not from the order of an old professor. I encourage all professors to consider moving through the grade levels of CCSSM to make the connection between the content and the order in which our pre-service teachers will actually be teaching it.

Finally to a parent's view. Not much to say from the kindergarten progression but she is my example to my students that I am witnessing the CCSSM from K-12 as it should be through my daughter. My son on the other hand I would get to witness some of the gaps that come are going to happen. I will highlight the ones where I have to interrupt my husband from helping our son with his homework. My son had been working with dividing pictures and naming fractions every year, but using the notation. In the second grade CCSSM, fractions are used as words to describe half, third, and fourth, no fractional notation. His school is using a textbook that is "aligned" to CCSSM and has review of previous grade quizzes periodically. I think this is for the teachers to identify gaps and address them. But have the teachers had enough time to digest what they have to teach and also go back and understand the previous grades? He was supposed to show one eighth in two different ways. My husband brought the question to me; since he nor my son could figure out what was meant since the rectangle was already divided into eighths. I wrote out the fraction  $\frac{1}{8}$  and asked my son if he could color in  $\frac{1}{8}$  of the rectangle. He did. Then I asked is there another way you could color it and show  $\frac{1}{8}$ . This illustrates the frustration of all involved. The teacher may not have realized that students previously might not have seen the fractions only expressed in words, the parents certainly do not think about fractions in words. It is hard for us to see that a question posed a little differently will cause students not to show their full knowledge just because the question confused them.

I hear so many people complaining about the "new" math. I always ask them to give me an example of the type of problem. It usually comes down to the fact they know how to calculate the answer

## CCSSM Through the Eyes of a Parent, Professor, and Student, contd.

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but not how they got it. The “new” part is the emphasis on the correct terminology and being able to justify the steps, such as showing the intermediate steps to the multiplication algorithm. For example, my husband is very good at mental math though he does not understand how he learned to take the short-cuts. I work through these examples showing how the steps the students are writing out now will, in time, become mental arithmetic steps. Any time you hear people complain about math, ask them to show you a problem and then you can usually walk them through it so they can understand why we are making them show their work. The text my son is using has parent letters for each chapter which are trying to explain the techniques they will be using and why. They are a good start but even I have trouble with some of the explanations. Another good resource I learned about at a KCTM board meeting are the PTA’s Parent Guides to Student Success, which tries to explain the CCSSM in parent friendly terms. You can find more about them at <http://www.pta.org/4446.htm>. Please address any negative comments about math, math can be fun!

**Leanne Faulkner**

KCTM College Vice-President

## Lessons of Coaching Basketball and Teaching Mathematics: Wrong Answers = Learning Opportunities, Jamie-Marie Wilder

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As I sit and watch the annual University of Kentucky and University of Louisville basketball game, I am blown away at the level of skill and athleticism these players exhibit. It took years for these young men to hone their skills. They first learned the fundamentals of shooting, dribbling, and defending. Several coaches have watched and given feedback to help these athletes improve their skills. Even though not all the young athletes on UK and U of L are at the same level in their performance, the coaches do work with them to improve their skills quite often by looking at their mistakes. How often do we hear of coaches bringing in their team to watch video of games? These video sessions are not always about what the team did right, but what the team needs to work on also. The mistakes are pointed out by the coach (hopefully) in a non-threatening way.

Teaching mathematics to me is much like coaching basketball. As teachers we provide a fundamentals base of number sense, spatial reasoning, estimation, and computational skills. Formative assessment can help us to provide critical feedback that could hone our students’ mathematical skills. We need to use our formative assessments more to determine the mistakes our students and classrooms as a whole are making so we can help them learn from these mistakes. So often a mathematics classroom focuses on deriving correct answers that we often force our students to believe that perfection is a must on their first attempts of a concept. This approach of expecting perfection is counterintuitive to how students learn. In the elementary years, students are allowed to play with mathematics in centers and construct their own meaning. By middle school, we expect students to memorize an arbitrary algorithm and apply it immediately. Students must be exposed to math through contexts such as models and taught how to critique others work to learn from their mistakes or alternative approaches.

The Common Core has a set of Standards for Mathematical Practices. One practice in particular is somewhat difficult to include in your classroom unless you consciously make an effort is Standard #3,

# Lessons of Coaching Basketball and Teaching Mathematics: Wrong Answers = Learning Opportunities, contd.

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*(Continued from page 6)*

Construct Viable Arguments and Critique the Reasoning of Others. I have found a way in which I can include this standard during my Algebraic Expressions unit. The title of this activity is “Wrong Answers = Learning Opportunities.”

In order to set up this activity, I had several formative assessments to determine how well my students were doing with the concepts of combine like terms and distributive property. As mathematics teachers, we know how important these concepts are to Algebra I and II. For both concepts I had the following formative assessments: bell work, exit slips, card sorts, white board work, computer-generated games, and informal conversations. I found a pattern in many of the mistakes that students were making.

Common misconceptions that I saw for combine like terms were as follows: neglecting the sign of the number, simple calculation errors, or misunderstanding of the idea of like terms means common variable two terms share. I was surprised though at one misconception. We had already covered exponents in an earlier unit. When students tried to combine  $2x^2$  and  $3x^2$ , I often saw  $25x^2$  instead of  $5x^2$ . If I had not had so many formative assessments and time built in to my classes to informally interview them, I would have never known that students misunderstood and thought they were to raise the coefficient to the power of the exponent. I talked with them and told them that I understood where their thinking came from, but the exponent in this case was merely a part of the variable. I was able to coach them on this misconception and we could make adjustments in our thinking immediately.

Common misconceptions that I saw for the distributive property were as follows: error in sign rules, use of addition instead of multiplication to distribute, and neglect in distributing a quantity across all terms in the parentheses. I was able to pull those students aside that thought distributive property employed addition. I used area models, algebra tiles and candy to help them see this repeated addition employed by the distributive property is actually multiplication.

After I had completed all the formative assessments and before I gave my learning check over combine like terms and distributive property, I gave my students the attached activity, “Wrong Answers = Learning Opportunities.” I told them that all the questions contained wrong answers. It was their job to determine where the student went wrong in their thinking. I empowered the students to provide feedback. Quite often I heard students say that this approach to math was more difficult because you really had to know your math in order to critique others. I had to help students when defending their position, which is that viable argument that the Mathematical Practice #3 calls for in the Common Core. The funniest part of this activity is after we covered these problems in class and talked about the misconceptions, I revealed to my classes the wrong answers came from them. One student said, “you mean I just learned math from our mistakes?” When I said yes, another student said...”Tricky Wild One!!”

So I challenge you to use this technique of using mathematical mistakes to provide mathematical learning opportunities. Instead of teaching all the time, empower your students to play with some mathematics and you can coach them to a mathematical victory!!

**Jamie-Marie Wilder**

KCTM Middle School Vice-President



## Wrong Answers = Learning Opportunities



Below are answers to math problems that use the idea of distributive property, combine like terms, and both strategies together. **Each answer given is INCORRECT.** Your job is to do the following:

- A) Write the misconception the person has that lead them to the wrong answer. You may want to include if you have ever made this mistake! (Remember we write in complete sentences!)
- B) Either explain how this person should have gotten the right answer or show the work that would have gotten this person to the correct answer.

**1.) Paul has the following problem:  $2(3x + 6)$ . His answer is  $6x + 6$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.

**2.) Janie has the following problem:  $4x+9-3x +7-6x$ . Her answer is  $13x + 16$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.

**3.) Allen has the following problem:  $5(3x + 6) + 3(7 - 3x)$ . His answer was  $30+6x+21$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.

**4.) Eldon has the following problem:  $12x^2 + 15x + 23 + 17x^2 - 10$ . His answer is  $44x^2 + 33$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.

**5.) Liz has the following problem:  $5(2x^2 - 4)$ . Her answer is  $100x^2 - 20$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.

**6.) Brad has the following problem:  $20 + 4(-2 - 5w)$ . His answer is  $-48 - 120w$ .**

A) What is the misconception?

B) What is the correct answer? Defend your position.



## University of Kentucky Third Annual STEM Education Symposium

February 3, 2012

At a time of unprecedented capacity towards knowledge sharing and collaboration, the Third Annual University of Kentucky STEM Symposium will address successful multi-disciplinary and multi-sector endeavors focused on STEM education transformation. Participants from across the Commonwealth will offer presentations, Round Tables, and a Research Poster Session on STEM and STEM education topics. Members of university and K-12 communities, and STEM education stakeholders across Kentucky are encouraged to attend!

This year's Keynote Speaker is Dr. Elizabeth Vander Putten of the National Science Foundation. She serves as Program Director of the Math and Science Partnerships program, the Research on Learning and Education (ROLE) program, the Research and Evaluation of Science and Engineering Education (REESE) program, and the Advanced Learning Technology Program.

To register: <http://www.rsvpbook.com/event.php?465922>

### Margaret Mohr-Schroeder, Ph.D.

Secondary Mathematics Program Chair  
Assistant Professor of Mathematics Education  
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