

September
2012



NEWS LETTER

Kentucky Council of Teachers of Mathematics

Message from the President

KCTM Members,

As your inboxes have probably made clear, the KCTM Board is actively gearing up for our annual conference on October 27th at the Griffin Gate hotel in Lexington. One of the ways we have prepared for this year's conference is to exercise more discrimination in the approval of speaker proposals, yielding better sessions and larger numbers of participants per session. This decision was made in **Response** to your feedback from last year's conference; I look forward to learning if you found this decision appropriate when reviewing your feedback from this year's conference.

The proposals we approved for this year's conference address many of the questions I continue to hear raised across the Commonwealth, which primarily deal with the theme of our conference; that is, questions concerning the *Interpretation, Implementation, and Assessment* of the CCSSM/ KCASM. By attending our conference you will learn how others have addressed these challenges and walk away with resources, lessons, and ideas to use in your classrooms and schools.

In addition to the resources you will take away from sessions, we are again happy to offer NCTM products to you at a discounted rate (15% savings off the original price). In my work at the Kentucky Department of Education I continue to reference NCTM's resources because I trust the organization, they are vetted by mathematics educators and representatives from higher education, and they are **Research-based**. Last year my wife and I both bought different copies from the *Developing Essential Understanding* series and we have used and shared these resources with many, many others.

Finally, I am very excited to share with you the products of our labor in crafting messages concerning the Cultural **Revolution** to influence parents' perceptions towards mathematics and mathematics education. During my President's Address those at the conference will receive hard copies of these messages and I am confident you will be as excited to share these with math and non-math colleagues, administrators, and especially parents as we seek to reshape how the Commonwealth views mathematics.

If you skip out on our conference this year, I assure you, you will have missed something you won't find anywhere else.

Seth Hunter

President, KCTM

Inside this issue:

| | |
|--|--------|
| 2012 Annual KCTM Conference Update, Julie Dunn | Page 2 |
| Primary Number Sense Building Lesson, Teresa King | Page 3 |
| Infusing Math and Art: Incorporating Projects to Showcase Student Creativity, Jamie-Marie Wilder | Page 4 |
| Why Can't Students Keep the Associative and Commutative Property Straight?, Leanne Faulkner | Page 7 |

2012 Annual Conference Update, Julie Dunn, KCTM President-Elect



Speaker proposals have been received and this year's conference promises to provide you with quality professional development in mathematics with a great emphasis on our theme, "Interpreting, Implementing, & Assessing Kentucky Standards". The 2012 KCTM Annual Conference will be held **October 27, 2012** from 8:20 am to 4:00 pm with check-in and breakfast beginning at 7:30 am. The conference will be held at **Griffin Gate Marriott Resort & Spa, 1800 Newtown Pike, Lexington, KY 40511.**

Hotel Accommodations: Griffin Gate Marriott, site of our annual conference, has worked with KCTM to give conference attendees a discounted room rate of \$99. You must make your room reservation by **October 5** to take advantage of this great discount. Visit [here](#) to reserve your room.

Awards Banquet: The 2012 Conference Awards Banquet will be held at Griffin Gate Marriott on Friday, October 26 at 6:30 pm. You may purchase tickets for the banquet when you register for the conference. This banquet will celebrate the 21st anniversary of MESA winners as well as honor KCTM grant recipients and PAEMST winners. Please plan to join us for this very special time.

Featured Speaker: Karim Kai Ani, a nationally recognized speaker, was featured in EdWeek as one of the top-16 young leaders under 35 transforming education in America. Karim will be speaking on using real-world topics to make math more engaging, meaningful, relevant, and cover multiple standards at once. Visit [here](#) for more information on Karim.



EILA & PD Credit: Attendees at the 2012 KCTM Annual Conference can earn 6 hours of EILA or PD credit. Proof of Attendance will be given at the conference during registration.

Make plans to attend our annual conference in Lexington this year! More information and registration can be found at www.kctm.org.

2012 NCTM Regional Conference



**NCTM 2012
Regional Conference
& Exhibition** CHICAGO, IL
NOVEMBER 28-30

NCTM's Regional Conference has the professional development opportunities you need to help your students succeed. By attending you and your colleagues will:

- Get the latest on **ELL** and **differentiation**
- Discover new and effective **instructional strategies**
- Learn practices central to teaching the **Common Core State Standards**
- Refine your **assessment** techniques
- And more!

Whether you are a classroom teacher, coach, administrator, pre-service teacher, or math specialist, this conference has something for you. Go to www.nctm.org for more details.

Primary Number Sense Building Lesson

Teresa King, KCTM Elementary School Vice-President



This is a simple primary number sense building lesson. It can be used with kindergarten and first grade as well as intervention students needing more number building activities...

Show me three fingers on one hand. Count your three fingers. Show me three fingers a different way on that hand. Have the students to share the different ways that they made three. Count your three fingers. Show me three fingers another way on that hand. Have the students to share the different ways that they made three. Select one student and say, "Help me count your fingers". Everyone, help me count.

Show me three fingers a different way again, on that hand. Select another student and say, "Help me count your fingers". Have the students to share the different ways that they made three. Let's count your fingers starting with a different finger. Does it matter which finger we begin our counting on? Why or why not? Show the students how to count their fingers different ways while counting and wiggling students' fingers.

Create a chart of hands with fingers demonstrating the different combinations of 3. Did you know that there are 10 ways to show 3 different fingers on one hand? (conserving number, one-to-one correspondence, creativity, organized list, combinations, problem solving).

Show me three fingers with two hands. If students hold up more than three fingers say, "I only want 3, what are you going to do?" Have the students to share the way that they made three fingers with two hands. Count your three fingers. Select one student and say, "Help me count your fingers". Repeat first paragraph, especially the "Where to begin counting". It doesn't matter where you start counting, as long as you count all of them and keep track of what you counted.

Move to show me 5 fingers with two hands. Show me 5 fingers a different way with two hands. Select a student to share how they made 5 fingers with two hands. Tell everyone to count the students' fingers. Say, "Let's count the fingers a different way. Can we count the fingers a different way? Is there another way to count the fingers?"

Show me 10 fingers with two hands. Now, show me 9 fingers on both hands with your fingers and not your mouth. What did you have to do to show me 9 fingers when you had 10 fingers?

Show me 11 fingers with both hands. (This is expanded notation- 10 and 1 more is 11). This is the transfer of one to one correspondence with fingers.

Show me 12 (10 and 2 more), 13 (10 and 3 more). The teen numbers are the most difficult to learn. What is the sum of 10 and 4 more? Show me 15. Tell the students to turn around with their backs to you and show you 10 and 6 more. "What is the sum of 10 and 6"? How do you know? Then follow through with 17, 18 and 19.



Infusing Math and Art: Incorporating Projects to Showcase Student Creativity

Jamie-Marie Wilder, KCTM Middle School Vice-President

I remember when I was an undergraduate at Western Kentucky University studying about Howard Gardner's theory of multiple intelligences. This theory had so many implications for learning it became a part of my senior thesis. I remember thinking a good teacher would embrace this idea of multiple intelligences and try to incorporate it into their lesson planning. Fast forward thirteen years, I am still pushing to be a good teacher and still trying to incorporate multiple intelligences into my classroom practice.

I have begun to seek out more opportunities for creative student expression. I feel without the incorporation of the arts, we as mathematics educators are overlooking a large demographic in our classrooms. There are many students who are creative and use the arts as their way to convey meaning and also use it as a mode of learning. Unfortunately for many students, mathematics is the study of numbers on paper. There are not a lot of meaningful connections between math and the real-world or other disciplines for our students. It is our job as math educators to ignite not only the critical thinking skills necessary for learning mathematics, but also provide means in which students can develop their creativity in a variety of mediums such as visual art, creative performance, song, and even dance.

So if theories such as multiple intelligences that are out there support a variety in the modes of learning and demonstration of that learning, why do we as mathematics educators tend to shy away from teaching to the strengths of a large demographic of our student population? My belief is that mathematics educators were good at math as students...we liked numbers on paper. We thrived on finding patterns and functions and graphing those relationships but did not necessarily thrive in artistic pursuits.

The question is how did a mathematics educator who was not strong in the arts provide an opportunity for students to use the arts to demonstrate learning? I incorporated projects into my classroom. At the end of a unit in my eighth grade math class known as "I See Linears," I had students to turn in a project as one of their summative assessments. Students were allowed to choose their groups of no more than three members or work independently.

In order to incorporate into your classroom, first you must develop a list of essential questions for students to explore. Each group will choose an essential question and begin to explore how to answer it. Then students need to choose the medium in which to demonstrate their learning and the answer to their essential question. This choice brought the most excitement to my students. So many were shocked that they could write songs, create collages, formulate games, write story books, script dramas or choose another medium to for their project. Students were also excited to share their work through class presentations. Of all the instructional strategies I have incorporated throughout the years, this strategy of projects grounded in the arts provided my students with the most excitement and yielded some of the best evidence of learning I've seen. Several students came up to me and thanked me for allowing them to "be themselves." That comment was one of the most rewarding experiences that I have had in my teaching career.

So how do you get started incorporating math and the arts in a project? First find a standard that can produce a product. Then create essential questions from that standard and finally allow the students to choose an artistic medium to showcase their learning. I have included my first attempt at incorporating the arts projects in my classroom. The standard it addresses is linear functions and multiple representations. There are the style sheet that explains the project and the scoring guide that I used for the project.

I hope that you will think about including more opportunities for students to showcase their artistic creativity in math. I know I am still smiling from the great songs, books, dramas, and scrapbooks that my students created last year. I cannot wait to share those projects to my current students so they can learn math in a new and creative way!

Infusing Math and Art: Incorporating Projects to Showcase Student Creativity, contd.

Name (s) _____
_____ Block _____ Date _____

I See Linears...

You have just completed a unit on linear functions. We examined how linear functions are represented as tables, equations, graphs, and scenarios (also known as the NAGS Rule). Linear functions are found around us daily. Think about where you see the effects of linear functions in your life. Then choose one medium to express your thoughts on linear functions. Below is a list of possible projects that you could create for this topic. Treat this project as a way of creating more teaching materials for future eighth graders to learn more about linear functions.

Possible essential questions or perspectives your projects could answer:

- a) Where linear functions are seen in the real-world?
- b) How can I calculate slope?
- c) *Choose one* How to... question. Examples include: graph a linear without a calculator? Create a table? Create a function rule?
- d) Talk with the teacher if you want to focus on a different essential question.

Each project must have AT LEAST FOUR examples of linear functions! Possible projects could include:

- a) Journal entry of at least one page. The journal entry must either be written neatly or typed so that it can easily be read by the class.
- b) Scrapbook page or collage that has examples and explanations of each linear function.
- c) Power point presentation that highlights linear functions.
- d) YouTube or Movie Maker presentation with narration and visuals.
- e) Song or rap that highlights linear functions. Lyrics must be turned in either neatly written or typed. There must be a performance of the song to the class for full credit!
- f) Flip book or story book about linear functions.
- g) Card sort activity utilizing multiple representations. A copy of the card sort must be turned in along with a presentation of the activity to the class.
- h) Games that help students to learn about some aspect of linear functions are possibilities. Any game materials and a written set of directions must be included for grading.
- i) Play or drama that highlights mathematical ideas that correspond to linear functions. The drama is to be performed in front of the class and a neatly handwritten or typed script must be turned in for full credit.
- j) Your choice...if your group has a creative idea not listed above then conference with the teacher for approval!!!

Infusing Math and Art: Incorporating Projects to Showcase Student Creativity, contd.

Group Names _____

 Block _____ Date _____

‡ See *Linears...Scoring Guide*

Research Question:

*Project Product (circle one): Journal entry Scrapbook page Collage Power point Song/rap
 Flip book Story book Card sort activity Game Drama Other (please specify): _____*

| Scoring Categories | 4 | 3 | 2 | 1 |
|--|---|---|---|--|
| Project addresses and answers research question | Project fully answers the research question with appropriate examples | Project answers the research question with 1 or 2 examples that are not mathematically appropriate. | Project partially answers the research question with 3 or 4 examples that are not mathematically appropriate. | Project does not answer the research question with examples that are not mathematically appropriate. |
| Project follows the established criteria from project style sheet | | Project fulfills the requirements outlined on the style sheet. | Project had minor deviations from the requirements outlined on the style sheet. | Project did not follow the requirements outlined on the style sheet. |
| Linear Example #1 | Mathematically correct in all aspects of vocabulary usage and multiple representations. | Minor mathematical errors in one aspects of vocabulary usage or multiple representations. | Minor mathematical errors in both aspects of vocabulary usage and multiple representations. | Major mathematical errors in all aspects of vocabulary usage and multiple representations. |
| Comments: | | | | |
| Linear Example #2 | Mathematically correct in all aspects of vocabulary usage and multiple representations. | Minor mathematical errors in one aspects of vocabulary usage or multiple representations. | Minor mathematical errors in both aspects of vocabulary usage and multiple representations. | Major mathematical errors in all aspects of vocabulary usage and multiple representations. |
| Comments: | | | | |
| Linear Example #3 | Mathematically correct in all aspects of vocabulary usage and multiple representations. | Minor mathematical errors in one aspects of vocabulary usage or multiple representations. | Minor mathematical errors in both aspects of vocabulary usage and multiple representations. | Major mathematical errors in all aspects of vocabulary usage and multiple representations. |
| Comments: | | | | |
| Linear Example #4 | Mathematically correct in all aspects of vocabulary usage and multiple representations. | Minor mathematical errors in one aspects of vocabulary usage or multiple representations. | Minor mathematical errors in both aspects of vocabulary usage and multiple representations. | Major mathematical errors in all aspects of vocabulary usage and multiple representations. |
| Comments: | | | | |
| TOTAL | | | | |

Why Can't Students Keep the Associative and Commutative Property Straight?

Leanne Faulkner, KCTM College Vice-President

During a recent class I had to again correct a senior mathematics education major about which property is $a + b = b + a$. I threatened to not let him graduate if he could not identify the properties. I use the analogy it takes two people to communicate on the phone. It does not matter if a calls b or b calls a, they are still talking to each other, like $a + b = b + a$. I have had this student for over 8 classes, so what I have been doing is obviously not working. So I did an internet search of different ways to remember the properties.

Ask Lois is a tutoring website, (<http://www.loisterms.com/lois9.htm>), who said think about the commutative property as commuting. As people drive to work, then later in the day drive home they change places; just like the numbers in addition or multiplication can change places. She also had an interesting scenario for the associative property. Consider 3 friends Alice, Brenda, and Cassie who are all associates. Today Alice and Brenda are talking but not speaking to Cassie (AB)C, tomorrow Alice will be left out and Brenda and Cassie will be the only ones speaking A(BC). Many other webpages also gave the same type of ideas of commuting as changing places and associativity as three numbers associating in different combinations. It seems many have the same scenarios for remembering these properties but it is not working for the students.

According to the MacTutor History of Mathematics Archive in an article about the development of the real numbers, Euclid assumed these general properties of reals without stating them as axioms, as seen in his treatment of numbers in Book VII. <http://www-history.mcs.st-and.ac.uk/index.html>. Until examples of noncommutativity are found in mathematics these properties were not formally recognized. Francois Joseph Servois introduced the terms "commutative" and "distributive" in a paper describing properties of differential operators, written in the Annales de mathématiques in November 1814.

Is this the reason students are not remembering the names of the properties that they have not seen a noncommutative example? Would subtraction and division not be their examples? Treating the properties as obvious facts that are not worth remembering by our students is exemplified by an article on the Purple Math website written by E. Staples, <http://www.purplemath.com/modules/numbprop.htm>. "My impression is that covering these properties is a holdover from the "New Math" fiasco of the 1960s. While the topic will start to become relevant in matrix algebra and calculus (and become amazingly important in advanced math, a couple years after calculus), they really don't matter a whole lot now."

While appreciating the middle comments, the affect of the beginning and the end are detrimental to the importance of the properties. The Common Core State Standards for Mathematics state the case for the commutative and associative properties as early as the first grade.

1.OA Understand and apply properties of operations and the relationship between addition and subtraction.
3. Apply properties of operations as strategies to add and subtract. Examples: If $8 + 3 = 11$ is known, then $3 + 8 = 11$ is also known. (Commutative property of addition.) To add $2 + 6 + 4$, the second two numbers can be added to make a ten, so $2 + 6 + 4 = 2 + 10 = 12$. (Associative property of addition.)

If anyone has any ideas of how to help student remember which property is which, please pass them on.

KCTM Vice-Presidents Contact Dr. Holliday about CIITS



Several of our KCTM Members and other mathematics teachers around the state contacted the KCTM Vice-Presidents with concerns over the CIITS resource site. We relayed your thoughts and suggestions to the Commissioner of Education in a letter to Dr. Holliday. View the letter [here](#).

Common Core Resources



Curriculum Analysis Tool for CCSS-M/ KCAS-M Some members have asked us what kinds of curriculum analysis tools KCTM can share. Here are two documents, produced by a team led by Dr. Bill Bush, University of Louisville, to assist you and yours in analyzing prospective curricular alignments to the CCSS-M. One is a [PPT](#) for professional development purposes and the other is [the tool](#) itself.

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