UETCTM NEWS

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Meeting

Next UETCTM meeting:

May 15, 2014

At EAST TENNESSEE STATE UNIVERSITY

CULP CENTER, Forum Room (located on top floor, west end)

3:00 pm to 5:00 pm

Guest speaker: Dr. Jeff Knisley

Breakout sessions TBD

Snacks and drinks to be provided courtesy of the ETSU Curriculum and Instruction department.

My Top 10

By Cindy Childress

"I found myself spending countless hours researching lesson plans, creating materials, searching for engaging activities and power points to teach my lessons."

Cindy Childress teaches for Hawkins County Schools

My first year of teaching was perhaps the most exciting and the most stressful of my career. I found myself spending countless hours researching lesson plans, creating materials, searching for engaging activities and power points to teach my lessons. Therefore, I have created a list of websites that I have found to be most helpful in planning what and how I teach to alleviate some of the stress for novice teachers, and perhaps give veteran teachers some new resources as well.

www.ixl.com

*"**IXL** is the Web's most comprehensive math practice site. Popular among educators and families, **IXL** provides unlimited questions in more than 2000 topics."* IXL is one of my favorites!!! It's not a free website, but it's well worth the price. The classroom subscription allows you to track your students' progress. However, I use my classroom money to buy the parent subscription to use in my classroom because it costs less. It's great for early finishers to practice skills. Language Arts is also coming soon to IXL.

www.henryanker.com

Henry Anker has developed several on-line tests to practice skills from Kindergarten through 7th grade. I also use this website for early finishers or during intervention classes to practice skills.

www.thinkfinity.org

"There are so many lesson plan databases online, but Thinkfinity stands above the rest because its content comes from the best names in learning-language arts from ReadWriteThink, math from NCTM, science from the American Association for the Advancement of Science, and more."

http://www.pppst.com

Pete's Power Point Station has tons of free power points covering a wide range of topics. Some of these I've used just as they are, and some I've altered a little to meet my objective.

http://illuminations.nctm.org/ActivitySearch.aspx

There are over 100 math lessons, activities, and resources on this site that provide a high quality of learning for all students.

www.visualfractions.com

Fractions always present a challenge for my students. This website models fractions in student friendly terms that students are able to understand. It is a great resource that models fractions with number lines or circles. Fraction games and worksheets are also included.

www.readworks.org

This site contains research-based high quality, engaging K-6 reading comprehension lesson plans and non-fiction reading passages & question sets that are aligned with Common Core Standards. And, best of all it's FREE!

http://commoncoresheets.com

Again, this one is FREE, a word I've come to love since becoming a teacher! This site has lots of more in-depth common core aligned worksheets covering math, science, language arts, and social studies.

http://tweentribune.com

*"**TweenTribune** is a free, not-for-profit online newspaper for kids, aged 8–15. It is updated daily with stories from the Associated Press that are chosen based on relevancy to pre-adolescents. Tweens can post comments to the stories which are moderated by their teachers, and teachers can use the site as a resource for meeting No Child Left Behind requirements for reading, writing and computer skills."*

www.teacherspayteachers.com

Teachers Pay Teachers is an online marketplace of free and priced teacher created resources available for download, including their original lesson plans, task cards, unit plans, and other course materials.

Dwain Brewer

"That evening I wondered if there was something else other than a worksheet that I could do to reinforce and assess the lesson that I had taught."

Dwain Brewer teaches for Hawkins County Schools

Most of us can remember the days before Nintendo, I Pods, and any form of electronic devices. Most of the games that we had to play were some type of a board game. One of those was checkers.

After graduating from college, my first job was an interim position in second grade. A month before school was out for the summer, a Promethean Board was installed in the classroom. While exploring all of the resources that were on the Promethean Board, I found an interactive checkers game.

One day while handing out a math worksheet to go along with the lesson I had taught, I overheard a student say, "Not another worksheet." That evening I wondered if there was something else other than a worksheet that I could do to reinforce and assess the lesson that I had taught. I remembered the checkers game. The next day instead of a worksheet, I decided to play checkers.

After the lesson the next day, I told the class that we were going to play checkers. I was surprised when only four students even knew how to play the game. After explaining the rules and how to play, I split the class into two teams. I then gave a student a math question and they had to come up with the answer.

I also had the rest of that team to solve the question to see if that person came up with the correct answer. After getting the correct answer, I would then let that student go to the Promethean Board and make a move on the checkerboard. The kids just went "crazy" but in a good way. That was the best math lesson since starting my interim position.

From that day forward, the students wanted to play checkers and we played checkers a lot. I also started using it as a way to assess in my other subjects as well. It also was a good classroom management tool. If they stared to misbehave, I told them we would not play checkers and it would work to get them back on task. It also was a great tool for students to think. They started thinking, "If I move here, they will move here or if I move here, then they move here." They could see that there were several options for them. What do we want our students to do with Common Core? Find different options or strategies to solve a problem.

As teachers, we are all ways searching for things to use instead of worksheets with our students. I found a great one that day. Who would have thought that playing checkers could be beneficial in learning? Needless to say, it took us three weeks just to finish the checker game to get a winning team.

May Puzzle

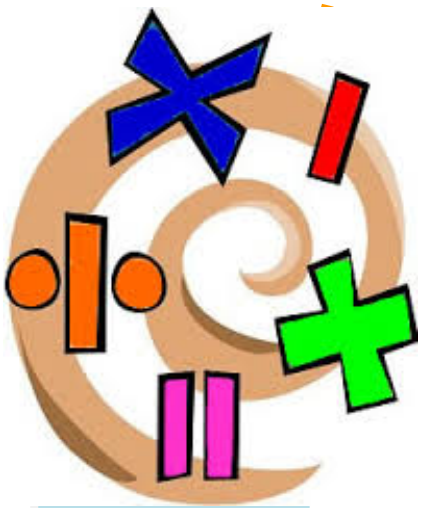
This month's math challenge comes from www.wuzzlesandpuzzles.com, a great website where you can find many fun math puzzles!

Try to fill in the missing numbers.

Use the numbers 1 through 25 to complete the equations.

Each number is only used once.
Each row is a math equation. Work from left to right.
Each column is a math equation. Work from top to bottom.

	-		X		/		+		9
+	■	-	■	-	■	X	■	X	
	-		+		+		+		32
+	■	+	■	-	■	+	■	-	
	+		/		+		-		11
-	■	-	■	+	■	-	■	-	
	+		-		-		-		-34
+	■	-	■	+	■	+	■	-	
	-		+		+		+		70
47		-9		17		80		-32	



Teaching Math in the 21st Century

By Melinda Miller

"What? I have to explain how I got that answer using diagrams, equations, and words?" These are the types of comments I hear from many students in today's math class. One comment I hear most often is, "I'm not good at math." I ask myself, "What can I do or say to convince students that math is not their enemy?" How can we, as educators, change our students' way of thinking about mathematics?

Teaching mathematics, or any of the various subjects, in the 21st century classroom is definitely not like it used to be. When I was in school, math class consisted of completing a worksheet with either a right or wrong answer. The student was never asked to explain or model his or her thinking and writing an equation was very seldom required. In today's classroom, math is so much more than getting a right or wrong answer to a problem. Math involves explaining and modeling how and why the student came to the conclusion he or she did. What steps can we take, as educators, to encourage our students to express and explain themselves while learning math and not just the computation of an answer?

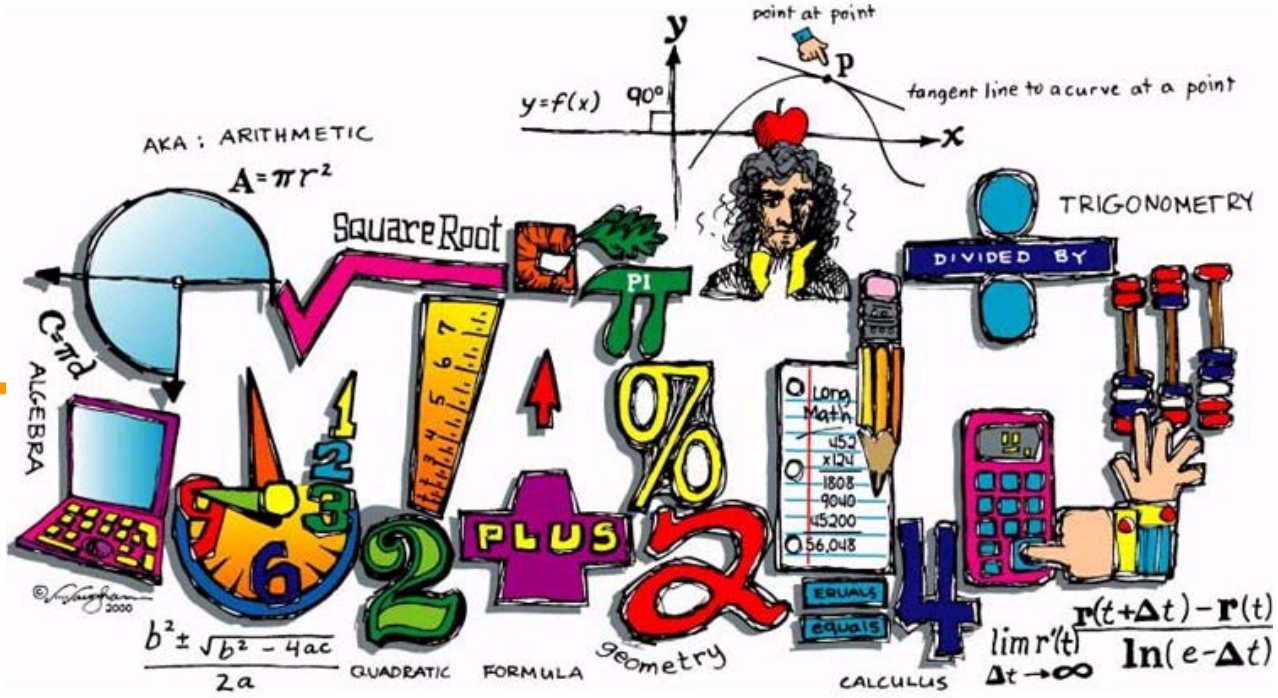
Questioning plays an extremely important role in today's math class. Encouraging questions in an open and accepting atmosphere is a very important aspect to learning. When students feel free to ask questions, they will inquire without hesitation and fear. Many students are reluctant to ask questions for fear of looking "stupid" or "dumb" before their peers. Every question has significance; no question is irrelevant. Encouraging questions with an attitude of acceptance and understanding can play a key role in opening a student's mind to a different world of solving math problems.

One thing is for sure, no two students learn exactly in the same manner. Incorporating different styles and methods of teaching will fundamentally reach each student in his or her own way. The 21st century teacher's role is to lead students to the solution of a problem. Manipulatives, a variety of teaching strategies, student discussion, and technology can be used in the classroom not only to enhance student learning, but also to enhance teaching. When students actually see how they get an answer deeper understanding begins to develop. I will admit that at times I have had my doubts about using manipulatives and/or technology (e.g. iPads, etc.) frequently, but have come to the conclusion that students need the opportunity to discover things for themselves. My epiphany about using manipulatives came when a student commented to me while working with adding and subtracting mixed numbers. I told the student, "You don't have to use the manipulatives if you don't need to." The student's reply was, "Mrs. Miller, I understand it better if I can see it." This conversation was profound for me and my way of thinking about teaching mathematics. If using manipulatives or technology helps to guide students to a deeper understanding of mathematics, then by all means I intend to continue encouraging their use.

"What steps can we take, as educators, to encourage our students to express and explain themselves while learning math and not just the computation of an answer?"

Melinda Miller teaches for Hawkins County Schools

The face of education has certainly changed. No longer is a teacher's role to check a student's answer to make sure it is correct. The 21st century math classroom is filled with exploring, creating, discussing, and discovering a whole new world of mathematics. Who knows what obstacles students of the 21st century can overcome when encouraged to explore and discover math in a whole different light. One day soon I hope to have many more conversations with students expressing their love of mathematics.

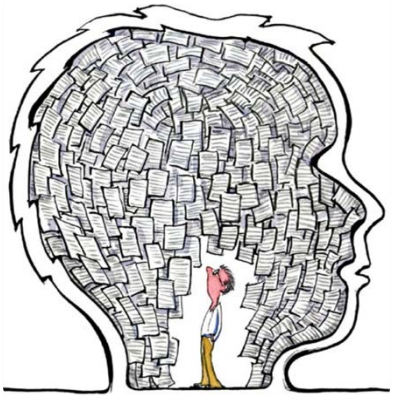


Fun Math Facts! http://www.makemegenius.com/

- *In America, mathematics is known as 'math', they say that 'mathematics' functions as a singular noun so as per them 'math' should be singular too.*
- *A 'jiffy' is an actual unit of time for 1/100th of a second.*
- *The word "FRACTION" derives from the Latin " fractio - to break".*
- *Have you heard about a Palindrome Number? It is a number that reads the same backwards and forward, e.g. 12421.*

A Picture is Worth a Thousand Numbers

By Sarah Vaughan



"...I realized that a picture really is worth a thousand numbers."

Sarah Vaughan teaches for Bristol TN City Schools

We've all heard the saying "a picture is worth a thousand words", but I had no idea that this saying also applied to numbers until I took a Mathletes course at ETSU this summer. You see, I have been a 6th grade Reading, Language Arts, and Social Studies teacher for the past three years in a local elementary school. I tend to be one of those people who like a change, and so I was thrilled to be moving to teach 4th grade math and science next school year. However, it had been a long time since I had done any math besides balancing my bank account, and furthermore, I had no real experience teaching it.

So, here I was preparing to teach 4th grade math and science in a state of fearful excitement. What if I wasn't good enough? What if I couldn't help my students to understand the magical language of numbers? I love math, and it always came somewhat easily to me in school, so if I couldn't relate to my students' struggles, how could I reach them? I went to my district's math training and then the state common core training which was held locally. This only added to my fears. This math was not the math I remembered. This math was different, and I did not know how to teach children to solve algebra problems without them understanding the concept of "x" – the dreaded unknown variable. I was solving 4th grade problems as though I was in a middle school or even high school algebra class! What was I going to do?

By some strange altering of events, I got into a Mathletes class that had been closed. Despite the loss of the last two weeks of my precious summer, I was ecstatic. I was also desperate. If I didn't figure out how to teach this new form of math that everyone was talking about, I didn't know what I was going to do. Thankfully, heaven (or something close) sent me Dr. Price and 15 amazing teachers from various schools in our area. It was in Mathletes that I realized that a picture really is worth a thousand numbers.

We began our class by exploring a different system called "Orpda". It sounds strange, and I was a little skeptical myself at first; however, Orpda served a greater purpose. It helped me to develop a better understanding of our base ten number system and to develop greater empathy for our students who are working to understand what is essentially another language with numbers as its alphabet. Math to me is the language of the universe or at least the language that humans have developed to better understand our universe. Orpda helped me to realize how difficult it is for some of our students to comprehend and speak that language. They not only have to know the numerical symbols and number words, but they have to know how to manipulate the symbols and numbers to solve problems. In addition, unlike our alphabet, our number system is infinite.

Often the most difficult part of solving a math problem for students is simply getting started. They do not know how to begin, what operation to use, or where to put the numbers. With pictures, this problem is solved; they always know to begin by drawing a picture or representation of the problem. So, the teacher will not have the problem of half the class looking down at their papers with either dazed or panic expressions as their pencils refuse to move. The students' pictures can take on any form, and they don't have to be artists to draw a visual representation of the problem. (Trust me, speaking as an artistically challenged person, if I can do it they can too. So can you!)

After the students have drawn a picture of the problem, they have a new perspective and can more easily see the information and relationships in the problem. After all, our students are constantly confronted with visual images through TV, video games, movies, and Apps, and all of these make them more familiar with problems in the visual form. So, once students have a visual representation of the problem, they have a better understanding of the problem and what it is asking, which in turn helps them to determine which operation(s) to use to solve the problem. Often times, students don't even realize the latter, as they take away objects and divide them up, because performing mathematical operations in picture form comes more naturally than performing them using the foreign symbols of mathematics. Instead, they simply use their visual to solve the problem, which makes it much easier to translate into a mathematical equation later.

Once the students have drawn their picture and used it to solve the problem, it is much easier for them to form an equation and explain their thinking and reasoning. This is a result of the deeper conceptual understanding and ability to internalize the problem, which are both brought about by the picture that was created by the student. The picture is personal because they made it, and it is more likely to help them relate to and connect with the problem. In this way, they are not just memorizing some step-by-step procedure they have learned only to be confused later when the wording of the problem changes. When the wording of the problem changes, their picture changes, and their thinking adapts.

Common Core has placed such emphasis on conceptual understanding, real world problems in the form of words rather than isolated numerical computation problems, and the ability to reason and explain. It is changing math from something that is memorized and regurgitated in the form of meaningless procedures to something that requires students to think for themselves. So, how do we as teachers teach our students to think? We allow them to explore various problems on their own and with others. We guide them through questioning, and we encourage them and help them to build their confidence through exploration and problem-solving. We teach them not to let math intimidate them but that math belongs to them and that they should use it as a tool. Most students are fearful of math because they do not realize that they have the power and that the numbers and symbols are only tools which can be manipulated as needed for their problem-solving purposes. Pictures can ease their fears and help the students to realize that the power is theirs to use as they will.

There's Math in My Reading!

By Nikki O'Brien

Using literature to teach science and social studies has become synonymous. Stories or informational text both enrich and deepen understanding of these content areas and give students a completely different spin on the topics. However, using literature to teach math is not as easy to plan or connect, but it is just as powerful.

There are many texts created **for** math. The Hershey's Milk Chocolate Fraction Book by Jerry Pallotta, the Sir Cumference series by Cindy Neuschwander, The Grapes of Math by Gregory Tang...the list goes on. These books are great. In fact I have a book bin box in my classroom library labeled "Math," for just such books. The issue I have had with literature and math connecting has been finding math in books that are **not** meant to be used with mathematic topics (You know, any book from the other gazillion book bins). While reading a fictional chapter book to my class, ideas for teaching reading and language arts bounce off the page. Figurative language, inferring, comma usage...here's another list that goes on. It is rare though, to find me reading a book like "Because of Winn Dixie" and ideas for symmetry, variables, and the distributive property to fly up at me. Actually, forget about rare, it's never!

At least, it never occurred to me until now. Something happened this summer to change how I look at all literature in preparation for a lesson, especially a math lesson. But before I get to the point, let me veer off in another direction. I promise, the detour won't be long!

My elementary school years were in the late 80s/early 90s. It was a different kind of childhood than the generations before me. There was a lot of "kidnap" talk in the news, Soul Asylum's "Runaway Train" playing on the radio, and in school, we had teachers and speakers reading to us about strangers, how to say "no," and not to wear clothes with our names printed on them. Then I would go home to hear stories from both my parents and grandparents about their childhoods. How their mothers would insist they go outside to play and not return until supper. How they would ride bikes with neighborhood kids in the street, go on adventure hikes through the woods, or go swimming or fishing at a nearby creek. They would do all these things without adult supervision!

Nikki O'Brien teaches for Washington County Schools

I have never stopped being amazed by that difference in experience, nor have I stopped being envious of it. So naturally, when I come across literature about characters who are living "free and fearless" childhoods, I'm hooked. Enter Love, Ruby Lavender by Deborah Wiles and Flutter by Erin E. Moulton.

The Books

Both of these books are chapter books suitable for independent readers in fourth - sixth grade. Love Ruby, Lavender is about a young girl who lives her life in my "free and fearless" (envious) way. She lives in a small farm town and her adventures aren't the same adventures you will find in Hatchet or The Cay, but they pull you in just the same in a subtle, heart-wrenching and warming way. Flutter also features a young girl of similar age to Ruby who takes it upon herself to follow a local legend in hopes of saving her baby sister's life. This story is adventurous too, with a more prominent bang. The rising action starts in chapter one and doesn't stop until the last chapter.

The Math

Each book is centered around a small town. Love, Ruby Lavender even has a map of "Halleluia, Mississippi" (the story's setting). The setting in Flutter is circular. It starts at home, navigates through a river, forests, hills, and winds its way around. This is where math flew off the page and hit my "teacher-who-thinks-everything-is-a-lesson" mind with a very loud thunk.

Since "Ruby" has a map provided, I figured that it would be the more ideal of the two to start with. The book could be used as a class read-aloud, student-led book club, or small guided reading group. While students are reading and doing their best inferring, comparing and contrasting, and context clueing, THE MAP is there by their side.

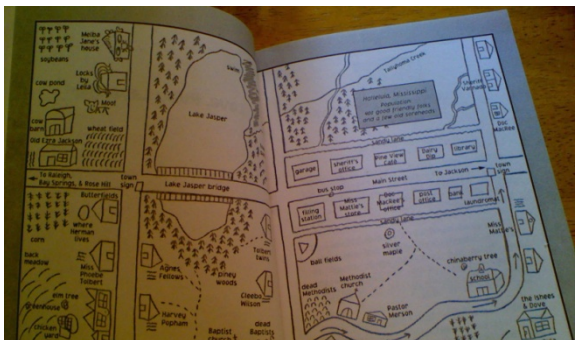


Image of the map from Love, Ruby Lavender taken by Nikki O'Brien.

After reading a chapter, the teacher can have the students connect not only to math, but geography as well, and create a map scale for the image. Then use it to determine whole number distances between various "Halleluia" locations. After the next chapter, guess what comes next? Fractions! A question could be, "What location is half way between the Dairy Dip and the Fire Dept. pond?" or, "If Melba Jane's house is 7/8 of a mile from Ruby's house, what fraction of a mile is The Pink Palace?" When another chapter ends, the map's focus could be converting feet to yards or miles. The map can be printed onto grid paper and students can find the area and perimeter of buildings or blocks in the town. A bigger map project would be for students to keep up with all the places Ruby goes throughout the book, chapter by chapter, by circling them on the map and drawing her routes. Then they can calculate how many trips she makes to various places, use their scales to determine how many miles she traveled in the book, and determine easier routes she could have taken. They could make up their own mathematical adventure stories (plug for math connecting to writing!). For example, tell the students they have two miles that they can spend in "Halleluia" and they must break their miles up into fractional parts over the course of a day. For each stop they make they must elaborate about what happens at that location ("I left Ruby's house and traveled 3/8 of a mile to Cleebo Wilson's house. My bike came to a screeching halt when all of a sudden...").

Within the book itself, there is a lot of time spent at "Miss Mattie's store." Math connections here could be adding sums, making change, and working with decimals. The exact same concepts could be applied to "Flutter," except now the challenge is not being given a map, but having to invent one along the way. Students will have to approximate both time and distance, because the adventure happens over a long range, but all in one day. For this reason, the students will have to wait until the end of the book to work with their maps mathematically.

So, with all this in mind, now every time I pick up a book to enjoy before reading to my students, I know I am going to be analyzing the text for every subject I teach, not just Reading. The next book on my "Summer Reading List" does not travel through a town, or include a map of one. By skimming, I can tell that all the adventure pretty much stays in one setting. Hmmm? What non-map math can I find in The One and Only Ivan?

Other fictional chapter books with maps:

The Inheritance Cycle by Christopher Paolini (Eragon, Eldest, Brisingr, and Inheritance) - independent reading age range - Middle School to High School

The Cay by Theodore Taylor - independent reading age range - 4th to 8th

Balto and the Great Race by Elizabeth Cody Kimmel - independent reading age range 4th - 6th

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Wiles, Deborah. *Love, Ruby Lavender,* (2005). HMH Books for Young Readers.

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The Upper East Tennessee Council of Teachers of Mathematics is an organization for anyone involved in mathematics education from preschool through college in the greater Tri-Cities region. This year we will have a single-day conference in the spring at a day and location yet to be announced. The purpose of UETCTM is to promote excellence in teaching mathematics and to share best practices among mathematics educators.