A recent Oxford study has shown that applying small electrical currents to part of the brain may make a person better at math. The study, led by Dr. Cohen Kadosh, found that one milliamp of electrical power directed at the parietal lobe increased mathematical ability among test subjects without being felt or affecting other brain function.

Those conducting the study hope that their research could ultimately be used to help those with Dyscalculia, meaning they have difficulty processing numbers. According to the article, as many as one in five individuals suffer from dyscalculia, which can have a negative effect not only in math class, but in daily life skills such as budget balancing and resource management.

The study also showed that the direction in which the current was directed across the brain played a tremendous role in how it affected math ability. Whereas going right-to-left across the parietal lobe with current made people noticeably better at math, running the current left-to-right universally impaired math ability among those tested.

Though the study is far from complete in its objectives, hope is maintained that it will provide knowledge of brain functioning which could benefit Dyscalculia sufferers long term. Those subjected to the right-to-left current still showed improved mathematical ability. With further testing and specification, electricity could ultimately be the new spark in math education.

Costas Efthimiou, a University of Central Florida physics professor, devised a calculation to disprove the existence of vampires, letting us all sleep a little sounder this Halloween season. His calculation, retrieved from Live Science, states: There were 536,870,911 human beings on Jan 1, 1600. Assuming the first vampire came into existence that day and bit one person a month, changing him or her into a vampire, there would have been two vampires by Feb. 1 of that year, then, on March 1, four vampires, and so on. If vampirism spread like this, it would only take two-and-a-half years to convert the entire human population into vampires with nobody left to feed on.

Whew!

Greetings to all from your Assistant Editor! I work behind the scenes, picking cute clip art, trying to find interesting trivia, and never get to actually “talk”, if you will, to any of you through the newsletter. So, having an extra page in the newsletter this month, I decided it was high time I threw in. Being a graduate student preparing to student teach, the words “cross-curricular-integration” have become hardwired into my brain (and probably retinas). We all know it’s a huge push this day, and that mathematics, given its highly technical language, can be one of the more challenging subjects in which to find good methods of content integrations, especially with language arts and history.

This book, *Six Days in October*, by Karen Blumenthal, is a great example of how math, social studies, and language arts can all blend to create a wonderful classroom resource. The book details the events leading up to the infamous “Black Tuesday” stock market crash of 1929 by documenting the exact happenings of the five days immediately prior to that fateful day. Using a combination of business, mathematics, and primary and secondary historical sources, the book crafts an interesting tale told through the voice of a woman who is both a historian and a mathematician.

The book is geared toward middle grades students, and could be especially compelling and interesting to students expressing curiosity in economics. It relates math to life outside the classroom in a very real, vivid way, giving students a great chance to answer the universal question: “When am I ever going to use this?” The book itself could be useful in a variety of different classrooms, and satisfies a number of standards for math, language arts, and social studies. A few of the key standards I noticed being represented that would be great proof of integration are:

**Language Arts:**
- SPI 0601.4.4 Distinguish between primary and secondary sources.

**Social Studies:**
- 7.2.spi.1. Recognize basic economic concepts (i.e. imports, exports, barter system, tariffs, closed and emerging markets, supply and demand, inflation, recession, depression).

**Mathematics:**
- SPI 0706.5.4 Use theoretical probability to make predictions.
- GLE 0806.1.7 Recognize the historical development of mathematics, mathematics in context, and the connections between mathematics and the real world.

APA Citation:
Career Opportunity

Coordinator of Math of Content and Resources

Tennessee sits at a critical juncture in education. As the first winner (along with Delaware) of the Race to the Top competition, we have a compelling vision, plan and goals designed to make our state the fastest improving state in the country in educational outcomes. At the same time, we know we have a long way to go, as our students currently rank 46th among states in math proficiency levels, and 41st in reading based on 2011 4th grade NAEP results. Only 16 percent of Tennessee students are college-ready in all four subject areas on the ACT. And we have a large achievement gap throughout the system along lines of race/ethnicity and income.

Charge: The Coordinator of Math Content and Resources is charged with coordinating the content components of the transition to Common Core State Standards in mathematics. This person will be responsible for ambitious goals for improvement in student achievement on the NAEP, ACT and PARCC exam in mathematics and developing a bold strategy to support the course structure and educator resources to support this transition. The Coordinator of Math Content and Resources will work with a group of leading educators from across the state and country to ensure deep state understanding of the expectations of the Common Core State Standards in mathematics and inform all aspects of our transition (including assessment design and training approach and instructional materials.)

Responsibilities:

- Coordinate and support the development and dissemination of high-quality, resources for common core transition in mathematics
- Spearhead initiative to rethink high school math course sequencing, staffing and supports
- Help shape the agenda for state-wide and local trainings to support continuous improvement of mathematics instruction
- Work with math positions in COREs across the state to support the sharing of best practice
- Coordinate and weigh-in on item review and course review in mathematics

The key characteristics we are seeking in this person include:

- A track record of dramatically improving results improving student achievement in mathematics
- Evidence of continuous improvement and ongoing learning orientation. Desire to work with educators from across the state and country to deepen perspective of effective instruction. (This is not a position where we are looking for an “expert in mathematics.” While we do seek someone with substantive experience with math instruction we are looking for someone who will coordinate state-wide learning in mathematics, not someone who will serve as a sole specialist for the content area)
- Strong communication skills and a demonstrated ability to communicate complex matters with educators in a clear and empowering manner. Experience working with diverse teams successfully.
- Strong organization skills and track record of managing projects to meet deadlines and achieve milestones over time

The Coordinator of Math Content and Resources will report directly to the Executive Director of Content and Resources and work with a variety of department staff members, vendors and educators throughout districts.

The salary for this position is competitive and commensurate with previous experience.

This position is based in Nashville, TN.
Curriculum Integration with Mathematics

By Jessica Johnson

Is the integration of subjects helpful when assessing mastery of a particular math skill? When planning a lesson teachers must attempt to integrate as many curriculum subjects into each lesson as possible. One single math class could integrate any and/or all subject areas. Reading is most often integrated into a math lesson by investigating and decoding word problems. A science lesson could integrate writing by having students create their own word problems. Science can be incorporated by discussing various measurements, mixtures, and compound equations. Social Studies can easily be introduced into a math lesson by analyzing particular populations, land mass, or elevations. My question is; when does curriculum integration get to a point that it may frustrate a child during math class?

Think back to a student who is very skilled in mathematical reasoning, but may demonstrate a reading level below his or her grade level. What would be the typical feelings of a student that excels in math more so than reading, science, or social studies? Typically, this student would experience a strong sense of confidence, excitement, and hopefully the feeling of self-accomplishment in the number sense. Those are characteristics all teachers want all students to possess and demonstrate in all curriculum areas. These students are confident in what they are doing when mastering a particular math skill. However, when does this strong math student start to dislike or even veer away from this excitement?

Numerous observations in the lower grades indicate that students are more likely to utilize higher thinking levels once a connection is made to a reading a passage on their grade level. They are more likely to take correct steps toward solving the problem. Many teachers do not enjoy “teaching to a test,” and tend to teach either using a hands-on approach or a more investigation based approach to the skill rather than looking at a test and only digging as deep as the question may require you to. Students are very engaged in these deeper approaches because it requires trial and error and in return helps to form a better understanding of the skill. Students have to work through problems to form a concrete understanding of a given problem. Once we switch over to a test mode question, additional problems become evident. Many students in lower grades will simply give up and either skip, or bubble in any answer because they may not be able to read all of the important words in the word problem. How does a student feel when he or she receives a teacher, system, or state created test and sees the first problem starts with a four to five sentence question? This is when our students who may not be as strong in reading will start to tense up and close themselves down to math. They form the opinion that they cannot solve a question when they don’t understand what it is asking. Frustration, self-doubt, and even the feeling of failure begins to form. Why shouldn’t it? If a student does not have an Individualized Education Plan (IEP), he or she
may have no accommodations made and be left to guess words in the passage.

As educators how can we help these students who struggle getting past step one: reading the problem? It is important we review the vocabulary of each skill. If students can recognize or associate a particular vocabulary word to a skill, they will have a better chance of understanding what is being asked. Many teachers will review vocabulary at the beginning of each unit and use it during lessons. For students, a balance must be used with these words. Teachers have a bad habit of saying these words rather than showing them. It is just as important to emphasize what the word “product” looks like as well as having them practice reading these words. Having them use these words on a daily basis will help them recognize what the word is and connect it to the skill.

Also, it is important to expose students to multicultural names. After observing students take an important test, it was evident students were not able to recognize Jose was a name rather than an operation they were supposed to know. This is when the social studies integration becomes important with math. Students would start struggling or give up on a problem that would have wavelength because they could not read the scientific vocabulary.

The vocabulary we expect students to know will not “pop up” in their heads. We need to constantly connect the words we feel they need to know with a concrete concept they can see or touch. Manipulatives become valuable tools for this type of learning. Handing students a place value cube using the terms hundredths and thousandths that they can see and touch makes it easier for them to understand. Placing pertinent vocabulary words into their word recognition bank increases their chance for success.

Once we, as teachers, instill confidence back into our students who may struggle with reading by letting them see rather than hear mathematically what is going on, they will be more determined to solve a problem. We have to set students up for success, not leave important bits and pieces out that we just assume they know. Constantly integrating curriculum subjects into mathematics can help assess a skill as long as there is a balance of the subject being introduced with mathematics. This may be an area you should look at and consider asking if you are setting your students up for success or assuming they are on track. Once we achieve a balance associated with integrating other subject skills with math, the students will feel the confidence to attack any kind of problem.
No Shoes? No Problem! By Beth Link

Maybe it started with TCAPs, maybe it started with NCLB, or maybe it started with the TEAM evaluation system, but for my class it all stopped with a blister from a dress shoe. “Mrs. Link…” a student whined, “my foot hurts. I have these new shoes, and my mom said that I had to wear them today, but they are giving me a blister.”

Was there actually a blister? It’s hard to tell. What it was in fact, was an attempt to leave class, avoid math, and maybe a chance to see mom or dad in the middle of the day. What the student did not expect was my reply… “If they hurt your feet, take them off.” That moment seemed to be the kind of moment where time stands still for a minute while everyone processes what just happened. Inevitably, when teaching a lesson at least ¼ of the class is in outer space, BUT not when the teacher makes a monumental decision to allow one student to do something semi-cool or fun. Those are the moments when we have 100% attention, because heaven forbid one student gets to do something cool that another does not.

Soon thereafter, we had one of those lovely, out of nowhere, recess rains. I absolutely cannot stand wet shoes, so, without even thinking I took my shoes off when we came inside to avoid their inevitable squishes and squeaks on the tile floor. Nothing was said, but I did notice a lot more attention on my feet than normal throughout the lesson. In the following days and weeks, I noticed a trend with this particular math class. Everyday one more child would take their shoes off in my class. It wasn’t a disturbance, they didn’t announce it, they didn’t play with the abandoned shoes; they actually began working better as a class.

I would love to say that after this epiphany they all went from “C” students to “A” students, but that was not the case. What did change though was the atmosphere of my classroom. This space that used to be full of math anxiety and fear of failure suddenly became just one little bit less intimidating for this group of students. Seriously, show me the rules or theories that say students must wear shoes to learn fractions! This one small thing made my classroom one more little bit like just chilling out at home. After my students figured out that I wasn’t going to bite them for wanting to be comfortable, they started being more comfortable asking me questions about other things as well.

As I referred to it in the beginning, teaching has become so uptight that students are scared to breathe the wrong way. As teachers we are feeling so much pressure that it can be hard to relate back to those days when multiplication was new and difficult. Kids typically do want to please you, and it is a lot of pressure to give them that “When you see a grown up come in the classroom, this is what you need to do…” pep talk. Just like we don’t have “all 5” teaching days every day, they don’t have “all 5” learning days every day.

Now, the flaw of no shoes? FIRE DRILL! Now that was a panic moment for all of us. I instructed them to quickly
put shoes on and tuck in shoe laces to keep from tripping. I then modified the “no shoe” policy to apply only to shoes that did not require tying. The “big picture” take away here though isn’t about shoes, it is about environment... And I’m not talking about if your classroom gives an evaluator the warm fuzzies when they walk in for 15 minutes to observe you. It is anyone’s guess what will happen during that 15 minutes that feel like an hour until the evaluator leaves. We would all hope for smiling faces and engaging classroom discussions, but classroom environment is so much more than that. To me, it is how you make your kids feel every single day, not just for those 15 minutes. No evaluation is going to measure the confidence that a child gains while in your classroom.

Kids need to be comfortable in their space, and just like any good lesson you teach, they will learn from your modeling how to be comfortable in your room. So I challenge you to find that one thing that makes you a little bit more human to your kids. For me, it is letting them see that deep down inside, I hate wearing shoes. For you it could be that you like to start your morning with a cha-cha. We all have those moments when we feel like being a grown up is just so over rated, so I encourage you to let your kids be kids while they are kids. No shoes? No problem!!

October Math Challenge!

This month’s math challenge comes from www.wuzzlesandpuzzles.com, a marvelous site where teachers and math enthusiasts can find hours of fun puzzles and brain teasers for all ages!

Try to fill in the missing numbers.

- The missing numbers are integers between 0 and 10.

- The numbers in each row add up to totals to the right.

- The numbers in each column add up to the totals along the bottom.

- The diagonal lines also add up the totals to the right.
Math Anxiety: Can Poor Teaching Cause it?

By Christus Leeper

What is math anxiety? Math anxiety is defined as feelings of tension and anxiety that interfere with the manipulation of numbers and the solving of mathematical problems in a wide variety of ordinary life and academic situations. Math anxiety is real! In a study in the journal Psychological Science, researchers found that there is increased activity in the brain region linked with fear in the brains of second and third graders with math anxiety. Because of the increase activity in the fear brain region, there was decreased activity in their brain regions linked with problem solving. Outside of the brain scans, researchers also found that kids with math anxiety worked more slowly and less accurately on the math problems, compared with kids without anxiety.

Can poor teaching cause math anxiety? Well, let’s think about it for a moment. Why do we have so many students coming into the classroom afraid to do math? When I reflect back to my early experiences with math, it wasn’t good. I had math anxiety and it’s not a good feeling. If I can be honest, I do believe it came from poor teaching and bad experiences. I can remember asking my teachers, “Why do I need to do the problem this way?” You know what I was told? “You just do it this way!” Well needless to say I felt overwhelmed because I needed to memorize the procedures and get the problems correct after a few tries. I didn’t understand, I felt helpless, and when I tried to work out the problems my mind would shut down.

How do we properly teach our students and not cause anxiety? Well, here are some suggestions:

- Let the students know that it is okay to make mistakes. Tell them that some of our most powerful learning stems from making mistakes.
- We must display a positive attitude when teaching math and tell the students to have a positive attitude when learning math.
- Give clear, illustrations, demonstrations, or simulations, tell the students that it’s okay to ask questions, or let the teacher know when they don’t understand the problem.
- Provide the students with plenty of hands on practice with manipulatives, drawing pictures, and discussions.
- Present your math lessons in different ways or model more than one strategy.
- If you are having trouble with teaching a particular concept, please ask a colleague or seek help.
- Tell the student that is okay to solve the problem differently than others.
October Math Trivia

- In England, what we call a billion, they call a thousand million, and what we call a trillion, they call a billion.
- In celebration of the month, did you know that the number sign, or pound key symbol, “#”, is actually called an Octothorpe?
- The billionth digit of π is 9.
"Every Number Has a Place"

By Becky Andies

As I sat in Dr. George Poole’s 2012 Mathlete class, he posed a question that intrigued me. Why are numbers arranged in the order zero to nine? Why is the number six the sixth number instead of the third number because its number name only has three letters. For that matter, why are alphabet letters in ABC order? Who decided the order of letters and numbers? I didn’t have a good answer to that question. I was glad that my first graders hadn’t posed that question to me. They just believe me when I tell them the order we use is the way it goes. I realized in that moment that letters and numbers are a foreign language for young students who have not been exposed during their toddler and preschool years. I didn’t do very well learning a foreign language in junior high school so I could relate to my young students trying to learn a system of letters and numbers that really doesn’t make sense.

During our continuing discussion, George said “Counting is one of the most difficult skills.” I think I just naturally thought that students could count because they have practiced it in kindergarten. The question I have now is “Do they really understand what they are counting and what the numbers mean?” My mind started racing to different ways my class could practice these concepts every day. They need to truly understand what the numbers actually mean. Just like any new skill, you start with a foundation, build on it and spiral it daily. Younger students need the practice and repetition of counting numbers daily. I’m not talking about participating in classroom discussions, working together in a pair/group with manipulatives and teaching one another.

Calendar is a daily exercise in first grade. My “helper” for the day is the “teacher” with my assistance. It covers a variety of math skills that are important to be successful in school as well as in life. My calendar is one that I have developed over my 15 years in first grade. As I thought about new ways to improve my students’ understanding, I did realize that one of my strategies is helpful once they understand the quantity of a single-digit number.

Along with the skills of skip counting, telling time and counting money, we practice place value every day. George said in our Mathlete class that place value is the foundation of our Base Ten system. If you don’t understand place value, math will be very difficult. I have heard the same sentiments from some of the upper grade teachers in my school. They commented that some of their students just don’t understand place value. Their concerns are what prompted me to try this strategy in my classroom.

On the first day of school, I ask my first grade students “What is place value?” Of course, they look at me blankly and say “I don’t know.” Now you might have a “Suzy Smarty Pants” or a “Billy the Brain” try to answer, but usually they have no idea. Since no one has an answer. I teach them our “Place Value Saying” – “Every number has a
place and depending on its place, it has a certain value." They repeat this saying after me. Then I ask the students “Does that help anyone know what place value means?” Most of the time, they will just shake their heads no. I reassure them that it’s okay to not know the answer today, but on Day #11 it might make more sense. Immediately they want to know why Day #11 is special. I tell them that they have to wait till Day #11 to find out. Also, I share with the students that 11 is one of my favorite kind of numbers. This starts a countdown to Day #11 trying to figure out why it has to be 11 and why it is one of my favorite numbers. We practice our saying every day for the next 10 days. Each time I will ask “Does anyone understand place value yet?” They will give some good attempts but they really don’t know. So I tell them it will make sense on Day 11. This develops a curiosity in the students. They can’t wait for the place value section of calendar on Day 11 to find out why it is a special number and the teacher’s favorite kind of number. Each day we place a popsicle stick in the ones bag to represent that day in school. We have also discussed that there is a tens bag and a hundreds bag which we will use later as the numbers get larger.

On Day 11, we say the Place Value saying one more time and I ask “Does anyone understand place value yet?” Of course they say no because they have waited 10 days to find out the answer to the mystery. So I write the number 11 really BIG on the board. I ask them “Do the ones I wrote on the board look different?” They will tell me no. I will tell them “Oh! But they are very different.” We have been placing popsicles sticks in ones bag each day and we bundled 10 sticks on Day 10 and placed that bundle in the tens bag. Now today we have 1 ten and 1 one which makes the number 11. The thing that will get a first grader’s attention very quickly is talking about shopping for toys. So I ask them “Which digit would you rather take to Toys R Us to go shopping?” 1 ten or 1 one? Sometimes I have to explain 10 dollars or 1 dollar. Then we also study the popsicle sticks in the tens bag and the ones bag. Then we will discuss that when I write the number 11 the digits look the same but

DEPENDING ON ITS PLACE IT HAS A CERTAIN VALUE!

You will see a gleam in some of their eyes. Not everyone’s at first, but after you do 22, 33, 44 and so on, they start to catch on. The students will even tell me we’re going to have one of your favorite numbers today on the calendar when they understand the concept.

Obviously, not every day can be my favorite number day, but we continue to practice place value each day. For example, on Day 28, I will ask “Which digit do you want to take shopping at Toys R Us?” Depending on their level of understanding, they will choose either the 2 or the 8. If they choose the 2, I will try to talk them out of it by telling them that the 8 is “bigger.” I hope they can make sense that the 2 digit is actually 20 so it is bigger than 8. On the other hand, if they choose the 8 I ask them to explain why they chose the 8 and help them to see that 2 tens is larger than 8 ones. They love the fact that I can’t “trick” them because they know the value of the digits.

With daily practice, most of my students comprehend the skill of place value. I think an extension I can use this year is that I will not only use the popsicle sticks with the “helper”, but I will give each student or pair of Math Buddies a set of place value manipulatives to demonstrate the number of the day to check for individual understanding. This activity will also help them understand that when you say the number’s name such as “twenty seven”, you say each digit’s value.

Author’s Note:

After experiencing the Orpda Number System with Dr. Jamie Price today, I am completely convinced that place value is a foreign language for most young students. As adults, we could rely our knowledge of the Base Ten System and it was still very difficult to comprehend especially the zero digit (tilde~) as well as the step to the hundreds place (skooobrat - *~~). Orpda also taught me that it is essential to use math manipulatives with students of all ages because I used manipulatives with the Orpda system. This session of Mathletes just reinforced how critical it is for a student to master the concept of place value for future success in mathematics.
Read, Write, Respect, by Lisa Reis

The importance of respect in the classroom is vital. Respect between the classroom teacher and the students is essential, but what about respect between the students themselves? As teachers, we want our students to get along and feel comfortable with each other, but the students are still afraid of making mistakes and are also afraid of being themselves. So the question remains: how can we foster a community that is solidly built on respect and kindness?

I completed my student teaching at East Tennessee State University’s, University School. During my time there, I observed and eventually led a morning routine called the "Morning Meeting". There are three parts to the Morning Meeting:

- Greeting: Every morning, the students would sit together in a circle and greet each other by name. The students would make eye contact and either shake hands, or perform some other activity that required interaction with the person that they were greeting. This could vary from rolling a ball to someone across from them and greeting that person, or a shoe greeting where each student puts one shoe in a pile and the students select one to find the person they will greet. No matter what the greeting, each student was recognized.

- Sharing: After each student had been greeted, the teacher would then ask if anyone had anything they wanted to share. Students could anything they felt was important, as long as it was appropriate. The students that were not sharing were actively listening to the speaker. When the speaker finished sharing, the students would raise their hands and positively comment on what had just been shared. This gave each student the feeling that what they had to say had value and that they were an important part of the class. I observed that the students really did care about what their peers had to say. They made kind comments and asked relevant questions. I was surprised by the lack of conflict within both classrooms I had been a part of. The students genuinely cared about each other's feelings and well being.
Activity/Team-Builder: Following the greeting portion of the Morning Meeting, the students engage in a game or a team-building activity. This gives the students an outlet for their energy and adds fun to the start of their day. The activity helps set a positive tone for the learning environment. A few games that I played with the students included "Telephone", "Sparkle", and "Hot Potato".

There are other benefits to having a Morning Meeting routine, as well. Students are not only learning to respect and care for each other, they are learning valuable communication and social skills. The students are taught to make eye contact when greeting each other and to speak clearly so that everyone may hear and understand what is being said. The Morning Meeting is also the perfect opportunity to talk about how to properly handle conflict. The students would sometimes be engaged in discussions about how a certain comment or action made someone feel, and the teacher would ask the students how they could change that behavior into something positive.

The Morning Meetings I observed were done in an elementary setting, but this would be a great activity for middle school, as well. Middle school is a time when students are more conscious of what their peers think about them and they feel more pressured to act a certain way for acceptance. As a middle school teacher, I plan on implementing the Morning Meeting during homeroom to set a positive, encouraging tone for the school day and I encourage you to research and decide whether this would be something you may want to do with your students.
UETCTM
Membership Application

Mail completed form to:
Jerry Whitaker
Mathematics Curriculum Coordinator
Washington County Schools
2029 Highway 11W
Blountville, TN 37617

Membership Fee: $10
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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 -Cities- region. We meet six afternoons per year in various locations across the region. The purpose of UETCTM is to promote excellence in teaching mathematics and to share best practices among mathematics educators.