



UETCTM

Newsletter

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NEXT UETCTM MEETING:

Tuesday, Feb. 17th 4:00-6:00
John Sevier Middle School
1200 Wateree Street
Kingsport, TN 37660

VOTING FOR NEW OFFICERS

Current Nominees:

President: Lawrence Nussio-Hawkins
County Schools

President-elect: Andrea Fissel-Johnson
City Schools

Treasurer: Jerry Whitaker-Washington
County Schools

Secretary: Pam Stidham-Kingsport City
Schools

NCTM Representative/Newsletter

Editor: Ryan Nivens-ETSU

Contact Ryan Nivens to be added to slate

What Do Numbers Mean?

by Laura Tipton

Infinity is a concept that is hard to grasp. 1, 2, 3, 4, 5... you can count and count and count some more, but where is the end? We can count our whole lives and never reach infinity. There are an infinite amount of combinations as to which we use numbers. The simplest problem to configure is $1+1$. Our lives revolve around one plus one, but why are numbers so important? We see numbers everyday and they are taken for granted. Have you ever stopped to think what they mean to you and how they have impacted your life? Think about it.

The fact is numbers are everywhere. You cannot escape them. They are there when you wake up in the morning and there when you go to bed at night. Numbers mean different things to different people. Take, for example, the highway speed limit sign of 55 mph. To a police officer this might mean a form of revenue when someone gets caught exceeding the posted limit. The driver of the car might think, "Oh, the speed limit is 55 mph. I can

probably get away with going 60 or 62." Another driver might think, "I've had so many tickets or so many close calls, I'd better go slower than 55 mph."

Numbers are also in our celebrations. The 25th and 50th wedding anniversaries are special occasions we choose to celebrate, but people think of these differently as well. Some people let them quietly go by while others celebrate with great exuberance. In some marriages, the husband might be thinking, "I've married the love of my life!" However, the wife might have the feeling that she's been a participant on *Survivor*.

Birthdays are also important occasions to celebrate, especially if you are 16, 21 or even 5. The 16 year old is deciding what the number 55 means to him/her while the 21 year old is plagued with responsible decisions. Five though is the first important landmark year that a child might remember. This is the first time a child becomes a "big kid." Many changes are happening at this age, for example, kindergarten begins a career of formal education.

In thinking of education, that number 5 means something totally different to a teacher. A 5 is something all teachers strive to

obtain. A 5 means (to people looking at the numbers or data) that the teacher is most effective in teaching his/her students. An evaluation score of 3 or 4, while to some means the teacher is doing his/her job, the teacher might feel like a failure. No teacher wants a score of 1.

However, I personally think that the number 1 is the most important number in education. There is so much focus on what the schools are doing wrong; sometimes we don't see what they're doing right. The story that doesn't get told quite as often is what teachers do on a daily basis. You hardly ever see in the newspaper that today a teacher:

- Got a student thinking about important life choices
- Worked long hours planning and doing research
- Didn't sleep for wondering how to reach a student academically or behaviorally
- Put a band-aid on a wounded knee

- Developed confidence in a child
- Increased self-esteem
- Comforted a child
- Showed a student how to share or how to consider others feelings
- Wiped a child's nose
- Listened

.....and the list goes on and on. On the flip side, you rarely see how a child has impacted a teacher's life either. A simple hug or smile from a child can greatly affect a teacher's day and even her life. A student may offer a new perspective on something a teacher may have never thought of or perhaps has forgotten. If one child or one teacher is positively touched, then a chain reaction occurs, and ultimately many more lives are affected.

So when we think of what numbers mean we may find it depends. If you ask a teacher, most will not say 5 is the most important, but will say that the number one is the most important. One teacher looking at her class of students as individuals, molding one student at a time, one day at a

time, one life at a time. One child looking at her teacher, molding the teacher, one day at a time, one life at a time. How have numbers impacted your life, and what do they mean to you?

One teacher + One student = 2
Changed Lives



The Importance of Cooperative Groups in Math

by Bethany Paupeck

Four years ago when I first became a mentor for the first year teacher on our 5th grade team, I was asked by my principal to focus on teaching her how to use cooperative learning when teaching math. My principal told me that she always saw this as a strength of mine when doing walkthroughs. So, now not only was I a mentor to this new teacher, but I knew that my principal had the expectation of seeing her using the cooperative learning strategies in her class. This took much reflection on my part to plan how to teach this new teacher to use cooperative learning in an effective way. Very often this is easier said than done.

Over the years I have always signed up for professional development classes on cooperative learning. I find the best way to train someone to be effective when using cooperative learning in the classroom if for them to first understand the difference between group work and cooperative learning. I was shown a cartoon drawing once of a group of students that were doing group

work. One student in the cartoon was doing all of the work. The other three students in the group were looking at their phone, making paper airplanes, and taking a nap. This is not cooperative learning. The teacher simply put the students in a group, gave them their task, and walked away. Out of these four students, only one of them was learning.



Cooperative learning groups are only effective if all students are engaged. This is where the challenge comes in. How do we ensure that all students are learning when working in groups? I have found several strategies to help me with this. First, I always use a timer. If I ask a question, I never tell the students to turn and talk about it with their shoulder partner or group. This could lead to one student talking the entire time while everyone else just sits there. I assign each student a letter or a number at each group. If a student is working with their shoulder partner, there is a Partner A and a Partner B. I will ask the question and tell the

Partner A's that they have 30 seconds to answer the question. Then, Partner B has 30 seconds to answer. This gives both students an equal chance to share their answer. If a student doesn't have an answer or is struggling with the question, their partner can ask clarifying questions to keep the conversation going for the 30 seconds. If they are working with their whole group, each student gets 30 seconds to share starting with student number 1 and ending with student number 4 in their group.

Another strategy that I use on a daily basis is to have one student be the problem solver and the other student to be their support. If I want all of my students to answer four questions that are up on the board, I will have Partner A answer the first and third question and Partner B answer the second and fourth question. Partner A starts with question one and explains to Partner B how they are solving the problem. Partner B is watching and listening for any mistakes. If Partner A gets the question correct, Partner B congratulates them. If Partner A gets the question wrong, Partner B guides them to the correct answer. Then, Partner B answers their question while Partner A supports. They keep taking turns until they have answered all four problems.

I have found over the years that the supporter is often learning more than the student answering the question because they are responsible for catching any mistakes. This strategy takes a lot of practice with your students. Some students are not good at being supporters and some are not good at talking out how they are getting their answer. This is why I use this strategy every day. After the first few weeks of school the students get comfortable with this style of learning.

I am a huge supporter of cooperative learning. I think that no matter how long you have been teaching, it never hurts to enroll in a cooperative learning class. It is amazing when you get to the point in the school year when you become the facilitator and can walk around your room and see all students learning. I also believe that students that know how to work in cooperative learning groups are becoming better citizens. They are learning how to work with others in a positive way.

First Year With Four Grades

by Heather Peterson

I wanted to be an over-achiever my first year teaching, and by teaching four grade levels of math, I accomplished that goal. I know what you're thinking, OH MY GOODNESS! I was thinking the exact same thing at the close of my first day. My first day in math class was two months after the first day of school. I took over for a teacher that was transferring, so I came into a classroom where routines were already set and the students had lost that first of the year excitement. The students had even built up some animosity because they were losing their teacher and gaining a brand new person for a replacement. I was going to have my hands full!

I knew that my "rookie" year was going to be very stressful and informative in more ways than one. I've always heard that teachers really don't learn how to teach from their college classes, they learn from their experience in the classroom. That statement is true! I had NO IDEA how much I was going to learn from my first day of teaching. I was lucky enough to have a week of observation with the teacher before she left. I learned the routines and I got a

sense of her style of teaching. The schedule consisted of 3rd grade homeroom and an hour and fifteen minutes with each grade. As you can imagine, my head was spinning by the end of that first week. I had learned the routines and a few of the names, but I had no idea how I was going to keep four grade levels of math straight!

After a month of "survival mode" I began to feel comfortable with my schedule and the math I was teaching. One of the biggest advantages to having multiple grade levels was that I got to witness first-hand the struggles and the accomplishments that was trending throughout the grades. I learned that students in all grades struggled with fractions, place value, and multiplication. The students had a pretty good understanding of addition and subtraction, geometric figures, and geometric and numerical patterns. I found that when the students could easily model a math problem they could discover the correct answer and the meaning behind it. The problems that were harder to model and make a connection with were being left behind and the students weren't grasping those concepts. Somewhere along the early years the lack of differentiation or the lack of the teachers' abilities made a gap for the students that didn't

automatically grasp those harder concepts. I made it my goal to think outside the box and try teaching methods that weren't necessarily comfortable and I think it was beneficial for me and my students. I'm not sure how or why it works, but there is a definite connection to being able to differentiate teaching styles and methods to meet the needs of various learning styles.

I've definitely gained a tremendous amount of knowledge and strategies that will stick with me throughout my years of teaching. I'm more than thankful for my first year teaching four grade levels of math!



Using iPads in the Classroom

by Katie Salyer

When I was an aspiring teacher in college, I had big dreams of the technology I would use in my classroom to extend student learning. Now that I am a classroom teacher, I realize that budgets do not always allow for the endless technological devices I once dreamed about. While I am lucky enough to teach in a district that provides interactive white boards, document cameras, and student computers, I have found one of my greatest resources to be iPads. I initially struggled with how to use only three iPads in a classroom of 21 children, but these iPads now play an integral role in my math workstations.

The iPads serve as a weekly station in my classroom. Students enjoy using learning applications that allow them to play games and practice skills. I have found games that reinforce skills in telling time, measurement, and fractions. I frequently use a base ten block app in which students can drag and drop base ten blocks to model addition and subtraction equations. The iPads, along with equations written on note cards, go into a student math center. Students work in partnerships to

model and explain their solution paths using the Base Ten application. The majority of these apps are free and can easily be downloaded onto student iPads.

Students can use iPads to complete small group assessments as well. My favorite application is called "ShowMe." This free whiteboard app allows students to not only record and save their drawings as they create them, but also to record their verbal explanations as they work. These mini presentations created by students can be saved and reviewed by the teacher. I give students a task to solve in the center and they use this app to show and explain their work.

Lastly, my students use the camera feature to photograph their manipulatives as they have arranged them to model their solutions. I can easily show these photos on the projector as students explain their thinking. The students use the camera to photograph a set of objects. We will then copy and paste the image of the set to model multiplication.

The three iPads in my classroom have greatly extended student learning. We use them daily for more than just "games." Students practice skills, document their own learning, and constantly surprise me with ideas on ways to use the iPads!



Moving Around

by Christy Boggs

When I started teaching in the fall of 1993, I got hired easily and taught in 2 different states and systems. However, after staying home and raising children a few years, it took much longer to “get back” into teaching. Therefore, as a teacher who has changed schools quite a bit and grades nearly every year, including subbing and interim experiences, I have gone through the ups and downs of... “Will I have a position next year?” or “What grade am I teaching next year?” Each time I was hired, I thought to myself, “Will the teachers like me? Will they like my ideas and personality?” I have had the nerves and anxiety that go along with first day jitters with not only parents and students, but a new faculty and staff, as well.

In all this moving around, I have found that the benefits have far out-weighed any stress or anxiety I have experienced. For one thing, I have made so many friends in so many places. I have seen the hard work that educators do in both public and private school settings. From these friends I have gained ideas, cooperation, hospitality, and even parenting ideas and recipes. I have seen the teaching methods of many wonderful teachers, which

have given me a chance to pick and choose from different methods and see what works best for me. Hopefully in these choices I am learning to be positive. Rather than to judge teachers on their various ways, I am seeing how we are all different, and together we teach and work to make future adults the best they can be. I have had to be strong and believe in myself as I was making friends and learning the ways of a new school and system.

Most of all, more than anything else I have learned in the “baby steps” it takes to gain a teaching job, I have learned a deep and abiding thankfulness. Each day, I have the opportunity to appreciate my job. I am thankful to have the opportunity to expand minds, nurture children, and to interact with wonderfully creative adults who have similar goals. This is not to say that I don’t get irritated at times or hit snooze in the morning. But, having travelled this path, I will forever appreciate my opportunity and the precious children and families I get to impact.

Making Fun of the Classroom

by Brad McDannald

Going back to school felt strange. While attending Mathletes, I felt like I was going back to school again. I was quickly reminded what it was like to be a student. Being a student is just as hard as being a teacher. Both learning and teaching requires focus, effort, communication, vitality, and dedication. While I took mini-vacations in my mind during valuable instructional lessons, I recalled what I liked about being a student. I love making fun of the classroom.

By making fun of the classroom, I am suggesting that a student make their classroom experiences fun. I also enjoy the effort the teacher puts in to making a student’s learning experience fun and memorable. I do not mean to suggest that you call the classroom a name, or talk about its clothing in a negative manner. I simply mean, making the classroom experience fun either as a teacher or a student.

When I look back to my experiences as a student I can never forget my silly teachers. Teachers who made me laugh and smile. More importantly, teachers who educated me through

absurdity. Mrs. Payne convinced my entire 4th grade class that she was 124 years old. I had a teacher, Mr. Calloway, who embraced all content areas through poetry and roleplaying. Mr. G., one of my biology teachers, completed *Fear Factor*-like stunts as a motivator for students. Ms. Green, another science teacher, told the class secrets about life that our parents did not want us to know. These four teachers treated the learning environment in a way that stuck with me forever. I knew after my interactions with these teachers that if I grew up to become an educator, I would embrace the “fun” that can be had in the classroom.

I am a newer teacher, but as I establish my teacher identity, I make sure to leave room for craziness. What I hope to accomplish with this craziness is creating a fun learning environment that my students will remember forever. I feel that if my students remember my classroom, the stuff I teach will stick with them too. I never forgot the secrets Ms. Green taught us about our parents. She told us how cold weather does not make us sick. She told my class that our parents did not want us to figure this out before the next snow day. She said getting sick from the cold was really the way our immune system responded to the change in temperature. That secret got me thinking, and made me invested in what she had to teach. Feeling like I

had an adult as an insider helped motivated me to learn from Ms. Green.

In my classroom I try to bring my own style of silliness. I noticed very quickly that any opportunity I allow for my students to correct me, allowed for an easy attention grabber. Instead of singing a song or turning out the lights to get my students' attention, I will ask them to get out the wrong book. They love reminding me that I said the wrong thing. It becomes a domino effect of students all trying to tell me that I said the wrong thing. I love to see their eyes roll at my inability to remember something as silly as our daily schedule.

One of my examples to make the classroom fun was with a lesson on even and odd numbers. As I read the book *Even Steven and Odd Todd* by Kathryn Cristaldi, the thought occurred to me that I had a golden opportunity to be silly. Every time we mentioned even or odd numbers in class, I would mistakenly say Steven and Todd numbers. I even wrote Steven and Todd in the place of even and odd. My class never hesitated to correct me. They would yell and laugh at my mistake. The energy would go up in the room, and like that, I had their attention.

I try to extend this to all facets of the classroom. For motivators I create bookmarks of my pets with laser

beams coming out of their eyes and superpowers, in the style of *Dogzilla* by Dav Pilkey. When we are ready to start a new concept, I might pull a video from the animated show *Animaniacs* to start the day with a strong dose of laughter. Sometimes my students know exactly what to expect. On Fridays, instead of boring music, we listen to Smooth Jazz versions of songs they love. At random, if the class is super on-task, I will blare the song, “Everything is Awesome” from *The Lego Movie*.



I can always tell the days I made fun of the classroom. There is an aura in the air as the kids complete their last tasks for the day. My behavior chart is hardly marked on, no student is asking if it is time to go home soon, and we about forget to pack up to go home. All that is left is smiles going out my door. When I am driving home I look in the rear view mirror and realize, I am smiling too. Being a student again reminded me how important it is to have fun in the classroom. These past ten days has been filled with fun and laughter. I enjoyed being a student again. I cannot wait until I get to try out new math solving strategies and new craziness.

Hope

by Meredith Woosley

When I graduated from college, I had big dreams of my own classroom. I had spent 10 years raising and teaching two wonderful daughters, one of whom has special needs. I was fortunate to see first-hand the progress they were making in wonderful environments at their school. The decision to return to college was a fairly easy one. My kids were older and could appreciate the sacrifices to help me achieve my dreams to set a good example for them. This time spent with them during their early years fostered my excitement to enter the field of elementary education.

Since I graduated in December, the elementary school year was already underway. I was prepared for that, and happily took the substitute teaching workshop. For the remainder of the school year I built relationships with different schools and gathered a wealth of useful tips and ideas from other teachers. In the following two years I was not able to secure a teaching position and I began to adopt an “always a tutor, never a teacher” attitude. I am starting my second year having my own classroom, and can reflect on what I have gained from my various experiences.

I have worn many different hats: parent volunteer, PTA president for 10 years, substitute teacher, academic tutor, classroom assistant, interim teacher, and now classroom teacher. These experiences have given me a well-rounded approach to teaching. I have seen situations from both sides and it has allowed me to be more efficient in my classroom, therefore making me a more effective teacher. My schema has been enriched by the various classrooms I have been in. From each teacher and classroom I have taken ideas and reworked them to fit my personal style and purpose.

During the years that I longed for my own classroom, I could not foresee or appreciate the experience that I

was gaining. Now in retrospect, I will be eternally grateful for the path that was chosen for me. I write this to send hope and encouragement to those teachers that are still searching for their intended classroom. Don't give up- Your classroom is out there, but, soak up the opportunities to grow as a teacher while you wait!



Dispelling the “Math Person” Myth

by Mary Salamone

“I’m not a math person.” It’s the first thing I hear from the students who are struggling in math. But are they struggling because they really aren’t capable of doing math (excluding, of course, students with dyscalculia or acalculia) or is it because they have talked themselves into believing that they “just aren’t math people?” To some degree math ability is genetic. However, for high school math, inborn talent is less important than perseverance, effort, determination, and self-confidence.

Students enter math class with varying degrees of preparedness. The well-prepared students tend to

perform better on assessments than the under-prepared students. Unfortunately, this disparity in performance is mistakenly attributed to an inherent genetic ability that cannot be changed. The well-prepared students believe that they are wired for math and the under-prepared students believe that they were born without the ability to do math and destined to stay that way.

Students, of any age, can grow their brains. The brain acts like a muscle; it grows and gets stronger when you learn. Intelligence is highly malleable. Empowering students with this knowledge will open doors that would have otherwise likely remained closed. They have some control over their level of intelligence, including their ability to do math. How liberating!

The cortex of your brain contains billions of neurons. Synapses connect the cells in a complicated network. Learning causes the connections in your brain to multiply and grow. The more you challenge your mind, the more your brain grows. Students can become better at math if they practice, but in the right way. It's not just the time and effort you put into studying math, but whether, when you study, you are learning something new and hard. That's right, you've got to push.

Let's bring persistence and grit back into the equation. Ditch determinism and have the students work hard by focusing on conceptual understanding, problem solving, and creative thinking. Become your students' advocate by telling them they can, because we know they can, and watch their self-confidence blossom. And if you've been wondering how to motivate your students, once you've unlocked their potential and they experience success, you might just have that one covered too.



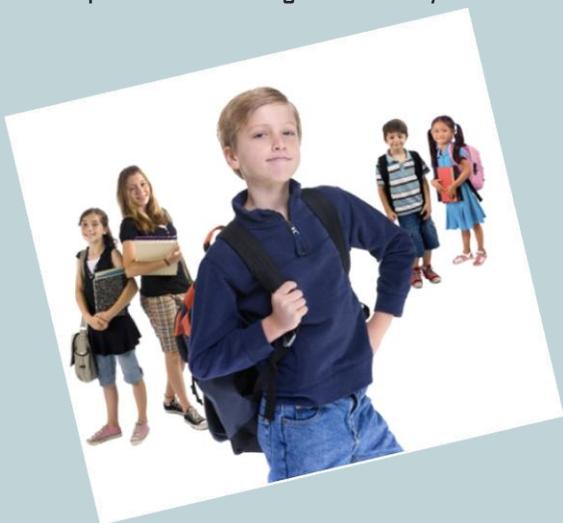
Stepping into a New World: Teaching

By Chancli Connaste

Upon graduating college, I began interviewing for teaching jobs around the Tri-Cities. When the first system I interviewed with offered me a job, I eagerly accepted it. In the following days, excitement around my new job was all I could think about. I hadn't put much thought into preparing for the upcoming school year, I was just excited that I would have a home and a place to learn and grow as a new teacher! The math specialist for Bristol City Schools gave me the opportunity to take a Mathletes course at ETSU. I told her I would love to take the course and signed up. Honestly, I was unsure what the Mathletes course would consist of or what I would learn through the other teachers and professor.

After my first day with Mathletes, I realized that I had a lot to learn and a lot to start preparing for my

new job at Tennessee High. With this realization brought to surface some fears that I had been suppressing. One fear that I have going into a new job is if I will fit in to the school. Attending Mathletes has helped with this fear, because it has shown me how accepting the teaching community is. My classmates in the Mathletes program have went above and beyond to make me feel welcome. Another fear I have is getting everything ready for my classroom and students before the first day. Particularly the other teachers in the Mathletes program have really helped me with this. They have given me lists of "must-haves" for my classroom and where is best to get the supplies as well as any advice they can think of to help me have a successful first year. This has shown me once again how helpful the teaching community is.



Throughout Mathletes, I have not only learned different ways of teaching Algebra, but also how to work successfully with other teachers. I have also learned that my first year is going to be hard, but if I go in prepared and willing to ask questions when I need help, I will have a better chance at being successful. I have learned a lot in these last 2 weeks with Mathletes, but I have much more to learn as August and the new school year approaches. One of the best things I am taking from Mathletes is connections with 11 other experienced teachers who can help me when needed.

Where is the Beauty in Math?

By Becky Grese

Talk with a typical high school teacher today and she will most likely say she isn't good at math or hates math. Another student may ask "when am I ever going to use this?" There are a few students who enjoy the challenge of a math class or seem to "get it" fairly easily. What makes the difference? Why do some students "love" math and others see no purpose in a math class?

As children learn to speak, they also learn to count. Young children may love to make up number games; counting by fives or tens, or counting backwards. Students learn to write the numbers. They learn that a written number may represent a particular number of items. They begin to complete simple addition and subtraction problems. Students look for patterns. Most young students "get math".

At some point in their school career, something changes for some students. I am not at all an expert, but having participated in Eastman Mathletes this summer, I am aware that I have neglected to share the beauty and order of mathematics with my high school students.

Looking back through history, we can see how builders, artists, and scientists have used mathematics in their creations or discoveries. The ancient Egyptians created the temples and pyramids by carving and hauling huge stone blocks. Some Egyptologists have postulated that some of the long temple hallways of the Karnak and Luxor temples were aligned to predict the summer and winter solstices. How were the Egyptians able to determine those dates? They made tables and charts and observed nature around them. The same could be said of Stonehenge in England. People recorded

observations and patterns and used those patterns to make predictions. That skill is mathematics in action.

In Europe, the construction of the cathedrals and castles required applications of math and physics. The builders needed to determine some way for stone walls to support stone roofs. Using a Roman arch, where the capstone helps distribute the weight and force of the stones above it, the builders were able to support longer roof spans. Creating flying buttresses allowed the distribution of the weight and force of a ceiling to be distributed even further so the walls would not buckle. Again, mathematics in action.

The influence of math is also reflected in the art world. Ancient Egyptian art was flat. Paintings became more life-like as artists used vanishing points to give perspective to their work. The Golden Ratio (1.618) shows up in Greek architecture and art. For example, the ratio of a column height to the width between columns in the Parthenon is in the Golden Ratio. Various artists have used the Golden Ratio to model a perfectly proportioned person. Michelangelo had to vary the scale as he was painting the ceiling of the Sistine Chapel so that the figures would look proportional from the floor. Again, mathematics in action.

The ancient and recent builders, artists, architects, scientists, astronomers, and others made sense of a problem and persevered in solving it. They reasoned, constructed an argument to support their hypothesis, and reviewed and critiqued their own and others' work. They had to attend to precision or they would have nothing to show for their work. And they obviously looked for structure in their observations.

Currently, students are introduced to the Fibonacci sequence and perfect square numbers, but are they given the time to observe the patterns themselves and create their own explanation of the patterns? Are

students introduced to other sequences of numbers; triangular numbers or oblong numbers? Do students measure circumference of circles and the radius and determine the value of pi for themselves? Do students use perspective drawing? Do students use scale drawing? Do students measure the height of the ball at its highest point when shooting a free throw and then relate that to a quadratic equation?

These are just some of the questions I have been asking myself. I hope to share the beauty and order of math with my students by having them observe patterns and create structure from their observations. I hope to have my students use the Common Core Mathematical Practices for themselves. I may not be able to convince all of my students, but I hope to at least show them there is beauty in mathematics.

Technology in the Mathematics Classroom

By Josh Mowell

Education is constantly changing. Our teaching styles, what we teach, and the standards that we teach by are adjusting to fit to today's view of what education should look like. With that change comes the incorporation and use of technology. In this essay, I will discuss how I use technology in my mathematics classroom.

Throughout the Common Core State Standards for Mathematics, the word technology is frequently used. For example, under the Interpreting Function tab in the high school CCSS, one standard states, "Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases."

In my classroom, I have incorporated technology in several ways. One of the ways I have done so is through Smart Board technology. If you have this technology in your classroom, you can utilize it several ways. Not only is the Smart Board a virtual white board, but also its software includes math tools such as a various graphing tools, a protractor and ruler, and virtual manipulatives such as dice and spinners. You can also find downloadable content on the Internet to use with Smart Board. Texas Instruments has a device called a CBR, or Calculator-Based Ranger. This CBR can be used with your computer or Texas Instruments graphing calculator such as the TI-84. The CBR can track the movement of an object, such as a person walking at a constant rate or an object being propelled across the room. This works great when teaching about linear and quadratic functions. Another piece of technology that can be used is student cell phones and school iPads or tablets. I utilize a website called Socrative.com. This website allows you to create

formative assessments to give immediate feedback to you and your students. After making a profile, teachers can create quizzes that students can complete using their technology in the form of cell phones, computers, iPads and tablets. You can create multiple choice, fill-in-the-blank, or short answer quizzes that can be student-paced or teacher-paced. The results can be sent directly to their cell phone and are even given to you in the form of a spreadsheet. This is a fun way to incorporate technology in your class and the students really enjoy using their cell phones to learn. Although I have only mentioned three, there are many other ways to incorporate technology in your classroom.

Technology should be used to help students to reason, think logically, and be prepared for college and the job market. However, it should not replace thinking. Therefore, use technology as supplemental source, not a primary source.

How Can a Teacher Flip the Classroom?

By Larissa Trivette

First, what does it mean to flip a classroom? A flipped classroom is one where the students view the instruction before coming to the classroom. Most teachers will videotape their lectures and post them online. The students will then view these videos in the comfort of their own homes. The next day the classroom is transformed into a place where students and the teacher can work together to solve problems and/or tasks. In one study at UNC Asheville, the professor noted that there were fewer failures in the flipped classroom. The professor did a survey at the end of the class and found that most students enjoyed the self-paced structure and liked the flipped method. The students also noted that the teacher's time was better used in the classroom since the instruction was already presented. In the flipped classroom, the professor is able to help students work on activities, worksheets, and tasks during class rather than leave students to complete them on their own.

The teacher's role is different in the flipped classroom. In the traditional setting, the students come to class to hear the instruction and view examples. If the students are lucky, the teacher will allow time to work on the assignment or collaborate with their fellow classmates. Unfortunately, there are still those teachers that lecture and then assign homework to be completed outside the classroom setting. This is very frustrating for students and parents. As changes in our curriculum have occurred over the years, many parents are unable to help students with their homework at the high school level. The students are left to struggle with their assignments on their own. The flipped classroom setting could alleviate the frustrations that the parents

and students endure. Unfortunately, stress and frustration are all part of the learning process but it does not have to be a burden on the students. In the flipped classroom, the students have a support group. They can turn to their group members for help and they have a teacher in the room working as a facilitator to help guide them in the right direction. This will help the students realize that the stress and frustration they occur are all part of the problem solving process. They will gain tools in the problem solving process that will help them dig through the problems and wade through the stress and frustration to reach a solution. By working collaboratively in groups, the students will gain team-building skills and will be able to work collaboratively with others, which are two qualities that employers insist their applicants possess.

Where do you Begin?

First, look at your content and separate it into learning objectives. Identify what topics you will want to relay to the students. One of the obstacles listed in the article "Flipping for Mastery," was that the students who struggled did not get through all the videos that were assigned. When the class had to progress and have a summative assessment these students were unable to be proficient because they had not worked at the pace needed to view all instructional videos. The teachers decided then that it would be best to organize their lessons with the most important concepts at the beginning of the objective and fill the last part of the objective with lessons that were not crucial concepts.

Then, videotape yourself delivering instruction on that particular objective or objectives. One of the tips that I have found was to keep the videos short. As I discussed this article with my colleagues, many gave me advice on how to do the lessons. Some teachers say to just videotape yourself delivering instruction in the regular classroom setting and then post it online. Others have said to get a sheet of shower board, cut it into a

smaller size and use it to work out examples for your video. Either way, once you have a lesson you are happy with, post the video online at a site such as youtube.com and make it accessible to all students. Keep this in mind though, there are many videos already online that one can use but your students will benefit most by watching videos you have created. The students get to see that you have taken time to make this video and it shows them that you care. This sense of caring can give the students motivation in the course that they would otherwise not have.

Next, the teacher needs to create activities, tasks, experiments, or problems for the students to work on to ensure they are thinking. This is probably the most time consuming part but it can be the most rewarding portion of the whole flip. The students must take the concept taught in the video and apply it to a real-world situation. The teacher does not need to make finding the solution an easy process. The teacher needs to be able to ask them questions that make the students think about the problem in a different manner to where they discover the answer for themselves. This method of discovery will help the students own that knowledge and be able to recall it in the future.

Finally, the students will need some form of assessment to ensure that they have mastered the topics individually. We will need to maintain the integrity of the assessment. It will take a tremendous amount of work for the teacher to create numerous tests for the same objectives. The multiple assessments are needed because when students fail to master one of the assessments they will need to go back, review, and then take another assessment. If the exact same test is administered, the second time students may just remember the answers from the first test and the reliability of the test is null. It is more appropriate to create different tests. The other downside to the multiple assessments is the grading of these

assessments. Software could help with this aspect of the flipping process. Software programs allow teachers to enter a test bank and then the software will randomly generate test questions for the students to answer. In addition, the software program will grade the tests for the teacher and students to have immediate feedback. One additional concept that the article, "Flipping for Mastery," mentioned was the teacher needs to have a conversation with the student before they take the assessment to ensure that they are not confused about certain topics. The teacher may talk with the students and realize that they are confusing major key points. This would be a great time for the teacher to redirect the student back to the videos or classroom tasks to help enhance the student's understanding.

Feeling Overwhelmed

Do not feel overwhelmed! I have not tried this concept in my classroom yet. I have weighed the positives and negatives and with that, I have concluded that anyone can flip their classroom. Am I going to encounter obstacles? Yes, but I am not going to let that hinder me from trying to do what is best for the students. The only tip I have for others that want to try this: Take it one-step at a time and do not give up!

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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.

