Upper East Tennessee Council of Teachers of Mathematics

NEWSLETTER VOLUME 18 ISSUE 2 OCTOBER 2017

INSIDE:

A World of Opportunities!
Meetings, grants, global travel

FALL MEETINGS: Engagement. Enlightenment.

NCTM Regional: Mathematics Meets Excellence

Make F2F connections with the people, resources and habits of mind that lead to greater success.

Orlando: Oct. 18-20
Click here for details.

Chicago: Nov. 29-Dec. 1
Click here for details.

Innov8 Conference:
Breaking Barriers: Actionable Approaches to Reach Each and Every Learner.

Put the power of teamwork in your instruction at this year's Innov8 Conference, as attendees work in teams to comprehensively address a self-identified problem of practice related to access, equity, and empowerment.

Las Vegas: Nov. 15-17
Click here for details.

PROJECT DRAGONFLY: Explore the world.

Miami University's Project Dragonfly is now accepting applications for **2018 Earth Expedition** courses offering graduate learning experiences in 16 different countries in the Global Field Program or Advanced Inquiry Program master's degrees. Travel to global hotspots to engage in action or inquiry projects of worldwide significance. Build collaborative relationships with leading educators, conservationists, and other students from around the globe. Click here for more information.

MET GRANT: For bilingual classrooms.

The newest MET grant offers financial support to Pre-K–12 schools for in-service training to enhance understanding and expertise in fostering support of multi-language development in the mathematics classroom. Click here for details.

Resourceful Instruction
Bring NCTM to your classroom!

PROBLEM OF WEEK: Calendar to classroom.

Each week 20 problems covering a range of areas are made available along with supporting resources, including classroom stories, sample student work, rubrics and scenarios for asking essential questions. While a paid POW subscription provides added interactive features, the problems and supporting materials are available for ***free*** for all NCTM members. Click here for details.

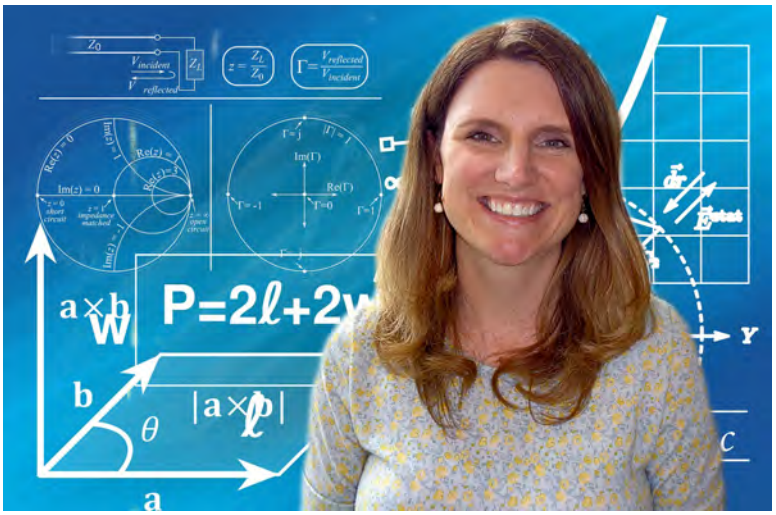
FEATURED RESOURCES: More to explore.

Are you checking out NCTM's featured resources? Each month, explore an array of curricular materials focused on tasks that arise from major ideas in each grade band or subject area. Organization allows you to concentrate on big ideas that develop over the course of an entire school year. Focus on key concepts, problem solving and perseverance and more. Click here for more details.

ENDING THE DATA DEBATE: Going long for greater good.

Jordan Benedict understands why some teachers are leery of data, given the way it's been used in accountability measures. "Data used in isolated instances is but a snapshot of a moment, full of variability and lacking in context." However, longitudinal learning data that "follows the complex narrative of education"—story-telling in other words—can be a important aid to teachers and students. In his two-part NCTM blog feature, he explains how. Part I is here, and Part II is here.

Dr. Jamie Price: Tackling the big ideas



A familiar guide to participants in the Mathelites program, Dr. Jamie Price has taken on a new role this fall, as an Assistant Professor of Mathematics Education in ETSU's Department of Curriculum and Instruction. While prior to joining the ETSU faculty she served on the faculties of Milligan College and Northeast State Community College, her past seven years experience as an instructor in the Mathelites program has been a key factor in her embrace of the importance of understanding "the big ideas" in mathematics.

Teaching concepts—the "why" as well as the "how"—is of particular importance to Dr. Price, and the reason she enjoys teaching Mathelites about Orpda, the number system that replaces numbers with symbols, which allows even the most experienced teachers to experience the struggle that beginning students undergo in understanding base-10, and to gain a deeper understanding of the number system itself.

For her Ph.D. dissertation at University of Tennessee-Knoxville, Dr. Price researched the effective deployment of Orpda in training pre-service teachers. She spent four weeks teaching Orpda, and used a three-level system of concept mapping to test for changes in conceptual understanding.

> "I found that the majority of the pre-service teachers showed an increase in their conceptual understanding related to place value based on comparing their pre-concept maps to their post-concept maps," Dr. Price notes.

> More big ideas, and more Orpda ahead!

Finding Math in Poetry

By
Lynda Matthews & Dr. Ryan Nivens

Roses are red, violets are blue.
Poems are great for teaching language,
And for teaching mathematics, too!

You probably already know how much fun kids have reciting their favorite poems in the classroom. But did you know that teachers can use poems strategically for math education as well? In fact, students can create numbers from poetic words and have more fun with the recitation of poems in a standards-based classroom.

In the poem "The Life Cycle of a Pumpkin" submitted by Rachel Boyd (found after this article on page 8), we can create numbers from poetic rhymes. This activity comes from the Navigation's Series book *Navigating through Data Analysis and Probability* in PreK-Grade 2. It is the lesson titled "Row your Boat" on pages 33-35. In this activity, students take a favorite song or poem and use tally marks to then create a frequency table. Once students complete this task, several mathematical questions can be asked. The teacher can demonstrate the questions with her example; then students can be given a turn to present their frequency tables and ask classmates similar mathematical questions.

Sample Questions:

"How many total words are in the song/poem?"

"How many different words are in the song/poem?"

"Which word occurs most often?"

"Which words occur more than once?"

"Where are the most repeated words positioned within the song/poem?"

On the following two pages, you can see how this activity can work with "The Life Cycle of a Pumpkin" on page 8.

Continued on page 6.

Finding Math in Poetry

(continued)

Occurrences of the words in the poem:

WORDS	TALLIES
You	I
Put	I
The	IIIII
Seed	I
In	I
Soil	I
And	II
Up	I
Comes	I
Sprout	I
Leaves	I
Vines	I

WORDS	TALLIES
Go	I
Out	III
A	III
Flower	I
Fruit	I
Finally	I
Big	I
Orange	I
Pumpkin	I
For	I
Me	III

WORDS	FREQUENCY
You	1
Put	1
The	5
Seed	1
In	1
Soil	2
And	1
Up	1
Comes	1
Sprout	1
Leaves	1
Vines	1

WORDS	FREQUENCY
Go	1
Out	3
A	3
Flower	1
Fruit	1
Finally	1
Big	1
Orange	1
Pumpkin	1
For	1
Me	3

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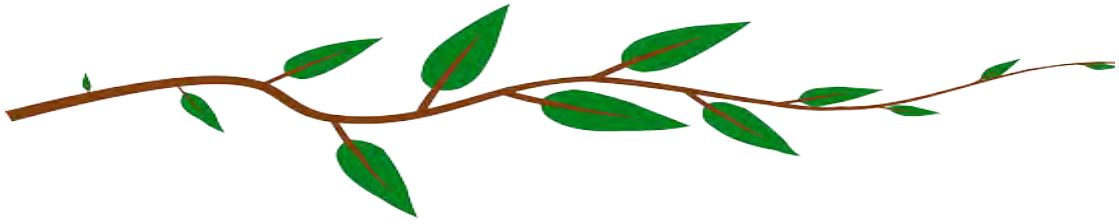


Finding Math in Poetry

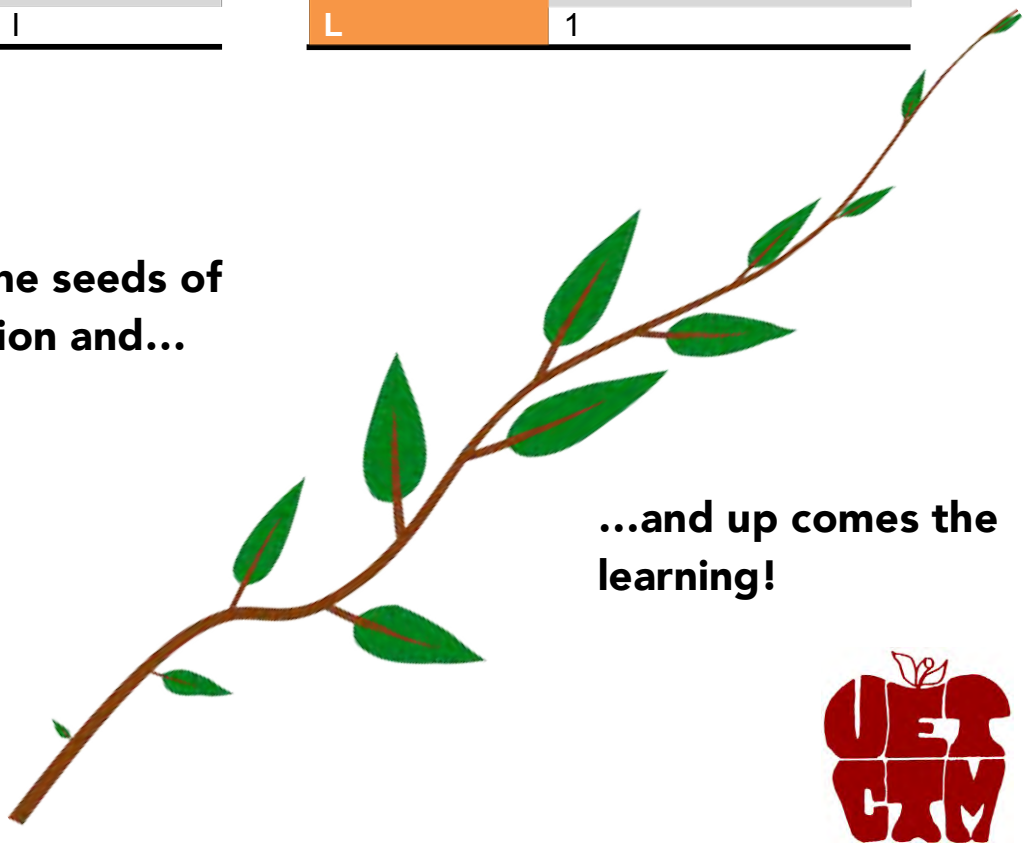
(continued)

Occurrences of letters in the first line of the poem:

LETTERS	TALLIES
Y	I
O	II
U	II
P	I
T	III
H	II
E	III
S	II
S	I
I	II
N	I
L	I

LETTERS	FREQUENCIES
Y	1
O	2
U	2
P	1
T	3
H	2
E	3
S	2
S	1
I	2
N	1
L	1

Put in the seeds of instruction and…



…and up comes the learning!

The Life Cycle of a Pumpkin

By
Rachel Boyd

I am a firm believer in helping students learn in a fun way. Since every group of students enjoy different ways, that can be a hard task at times. The group I had during student teaching absolutely LOVED singing songs and memorizing fun sayings to remember their academics. When it came time to study the life cycle of a pumpkin, I decided that a fun poem would help them be able to more easily retain the information and vocabulary. I created the poem below and taught it to them the first week of my pumpkin unit. They learned it quickly and performed well on their spelling and comprehension tests.

The next week, we visited a pumpkin patch for our fall field trip. When we sat down to listen to a staff member tell us about pumpkins, they started reciting it without me prompting them. I would also hear them saying it with their friends on the playground or when I would pick them up from lunch. It made my heart so happy. Below is the poem with the vocabulary words in bold. I hope you enjoy it!

■

*You put the **seed** in the **soil***
*And up comes the **sprout***
*The **leaves** and the **vines** go out, out, out!*
*A **flower**,*
*A **fruit**,*
And finally,
*A **big, orange pumpkin** for me, me, me!*

SPECIAL SECTION: GROWTH MINDSET

What is growth mindset?
Do you have it?
Should your classroom have it?

Growth Mindset

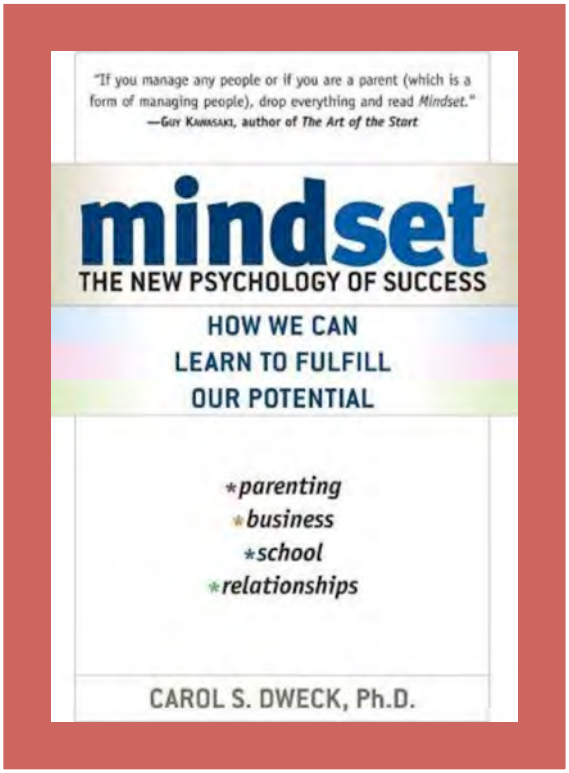
By
Lacey Wernke

As teachers we often become very excited when we witness one of those precious "Aha moments" for one of our students, but how often do we get to personally experience one of those precious moments for ourselves?

Recently, I had the opportunity to learn about the book: *Mindset: The New Psychology of Success* by Carol Dweck, and during my instructor's lecture, I had my own "A-ha moment."

For me, that "Aha moment" came when my instructor said that as teachers and parents we often "praise the person rather than praise the process." Think about that. How often do we say to kids "Wow, you're so smart," rather than "Wow, you worked really hard on that problem"? We do it all the time, and our kids are aware. They know exactly which kids have been told they are "so smart" fifteen times that day and which kids have heard it once, and they begin to believe it to be true. We are fostering a *fixed mindset* rather than a *growth mindset* when we make comments like those.

The research covered in *Mindset: The New Psychology of Success* concentrates around the idea that the belief we have about ourselves guides and fills nearly every part of our lives. What belief are we instilling in our children about their abilities to problem solve, face challenges, see effort as a path to mastery, or see the amount of work it often takes for something to become successful when we continuously praise the person rather than the process?



Growth Mindset

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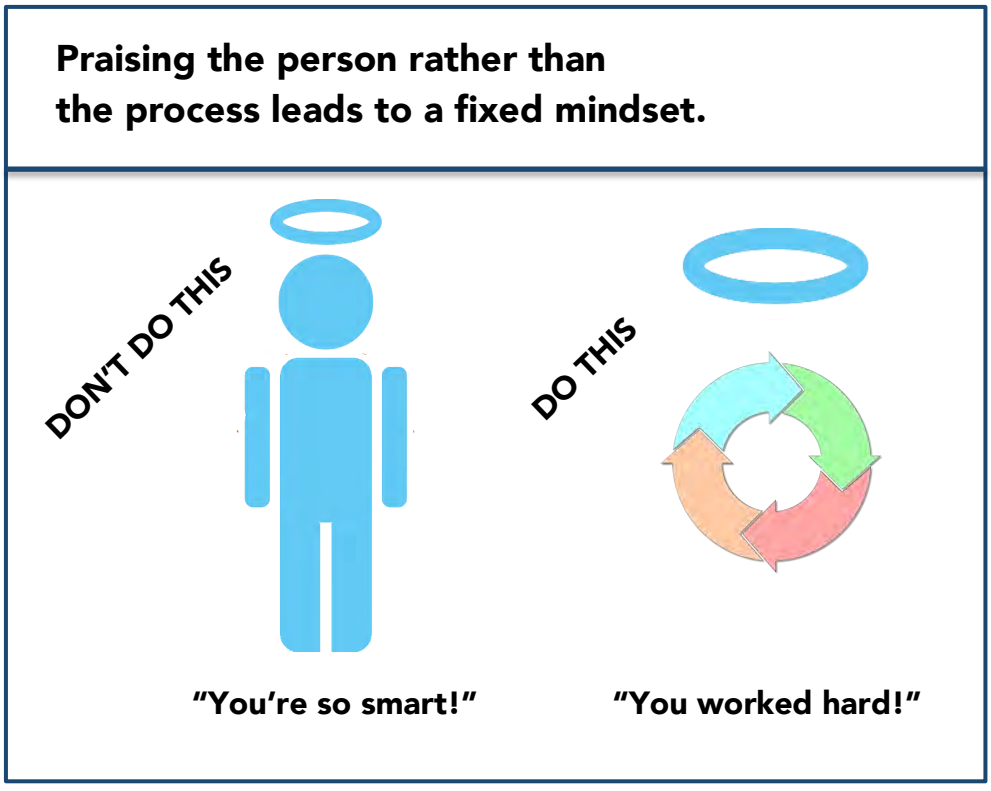
"This belief limits our potential or enables our success. It often marks the difference between excellence and mediocrity. It influences our self-awareness, our self-esteem, our creativity, our ability to face challenges, our resilience to setbacks, our levels of depression, and our tendency to stereotype, among other things."

– Alex Vermeer

You see, I went into the lecture thinking I would walk away with new tricks and strategies that would help me in the classroom this coming year, and although that did happen, I am also walking away a better teacher, a better parent, and a better person. So, I encourage you to look into Dweck's book and learn a thing or two about your own mindset, and I hope you experience one of those precious "Aha moments." ■



Jack of ALL Trades, Master of None...Yet

By
Aimee Morelock

I grew up hearing the phrase "do what you love, love what you do." It sounded nice, but that was precisely the problem. There wasn't anything I really loved doing, so I followed the path that paid the most. But sometimes when you least expect it, life spins you in a completely different direction than you were once headed. For me that change happened in an instant. The event came in the form of a violent attack which made me question my purpose and challenged my views of what I held to be important. I finally stopped accepting the title of "victim" and chose to see myself as a survivor. What I needed the most now was to work in a career where I could make a difference, not just an income. I had worked in insurance sales for years and was suddenly transitioning into a career in law enforcement. I was venturing into what I considered to be uncomfortable and extremely unfamiliar territory. For the next 10 years I worked as a police officer, struggling to heal, battling my own emotional demons, and helping others I encountered along the way.

It was only as I began working in the schools when it hit me, for the first time…I found my passion! Teaching!! This is where I could make an impact…truly change lives!

Continued on page 13

Jack of All Trades, Master of None...Yet

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Fast forward to now, after a few years teaching under my belt. I'm getting ready to start my second year teaching 4th grade math. Until this summer, I knew I was smart, and I knew that math, in particular, was my area of expertise. I mean 4.0 GPA, top of my class…you get the picture—I was that kid! (Cough, cough!) Can you say fixed mindset?? I was stuck. I had stopped trying to figure out the why's of reasoning in math and didn't even know I was stuck. Which is exactly where "the power of yet" comes in. This seemingly small phrase opened up my mind and allowed me to gain entry into a deeper level of conceptual understanding that I didn't know existed! All I'm confident about now is that I know nothing about math…yet. But my world has just opened up! I realize my ability to ace tests based on fact memorization and rules does not equate to mastering content. What's amazing is "the power of yet" can be used at any age, in any area. So what does that mean for my classroom next year? The power of the phrase "I can't…yet" will be at the center.

Growth mindset is essential for developing a confident and comfortable classroom environment. A place where we all learn from the mistakes we make. My students may not come to me with a deep understanding of how numbers fit together, but they will. So ask me again… have I mastered this thing called teaching? No…not yet. ■

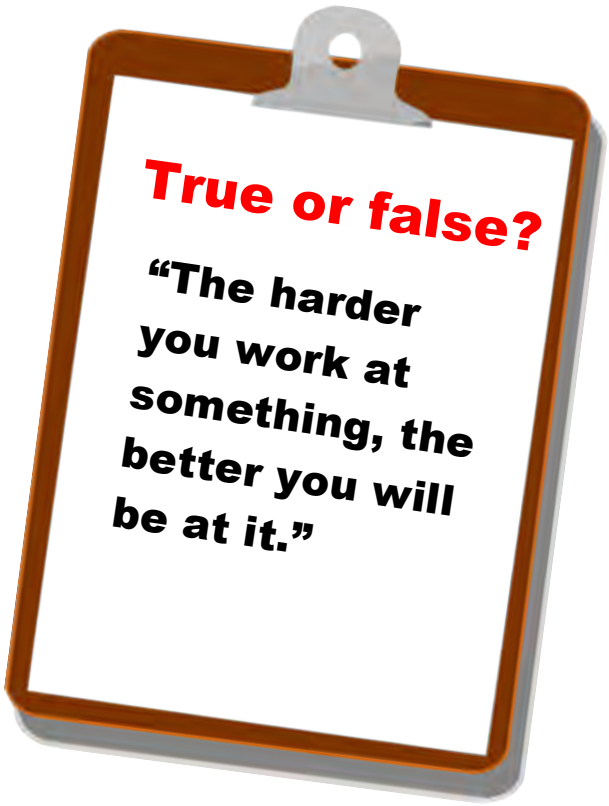
The power of the phrase "I can't…yet" will be at the center of my classroom.

It's Never too Late to Learn

By
Tracie Jones

At the young age of 37 I had an "Aha" moment. Both of my sons were in school, and as a mom with a Bachelor of Business Administration degree, what was I going to do with my life? I started substitute teaching. It was in a 5th grade math class that I had my "Aha" moment. I heard comments like, "Wow! You explained that good" and "Oh! Now I get it!" I knew then I wanted to be a teacher. Did I tell you I was 37 years old?

In my MathElites class we were asked if we had a fixed or a growth mindset. Huh? We were given a quiz to see if the scenario was a growth or a fixed mindset. An example statement was, "The harder you work at something, the better you will be at it." This particular statement is of a growth mindset. After learning more about this concept, initially I felt I was of a fixed mind set; I feel I am an old school type teacher, but after learning more about this, I want to be more of the growth mindset.



In today's society we hear statements such as "this new math," or "that's not how I learned math," or "I can't help my kids with their math." I believe this is a fixed mindset and not one of growth. As important as it is to educate our students about having a growth mindset, we need to set the stage for our parents as well. Remember, it's never too late to learn.

Continued on page 15.

It's Never too late to learn

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So, I thought I was being a great teacher by praising my students when they get the correct answer. I mean, that's what math is all about, getting the right answer, right? Another takeaway from Mathelites was being of a growth mindset, which means that I should be praising my students for the process by which they arrive at their answer. Students need to know it's okay that there is more than one way to solve a math problem. This builds a safe environment in a classroom as well as expressing creativity in how students understand the process of solving the problem. Imagine the confidence a student feels when he/she knows how they choose to solve a problem was a correct way!

Finally, not too many people like the thoughts of struggling in any facet of life. Nobody enjoys making mistakes. But we all know both are a part of life. As I watched a video about the power of mistakes at a workshop this summer, it took me back to my 4th grade math class where math was Greek to me. As I watched children speak about not understanding math and how it made them feel, it made me realize how very

important it is to set that safe environment in my classroom and let students know it's okay to make mistakes as long as we learn from them. One technique that I will be implementing in my classroom this upcoming fall is "My Favorite No!" I will be choosing a student who solved a math problem incorrectly. The student will remain anonymous, and I will discuss with the whole group why this particular process is incorrect. I will call it "my favorite no" – I LOVE THIS! I will be discussing "The power of YET." You may not have it yet, but you will. Also, I like the quote, "You're not falling; you're taking steps to get to the right answer." I learned making mistakes causes your brain to grow. Hallelujah! – my brain should be huge!

Continued on page 16.

It's Never too Late to Learn

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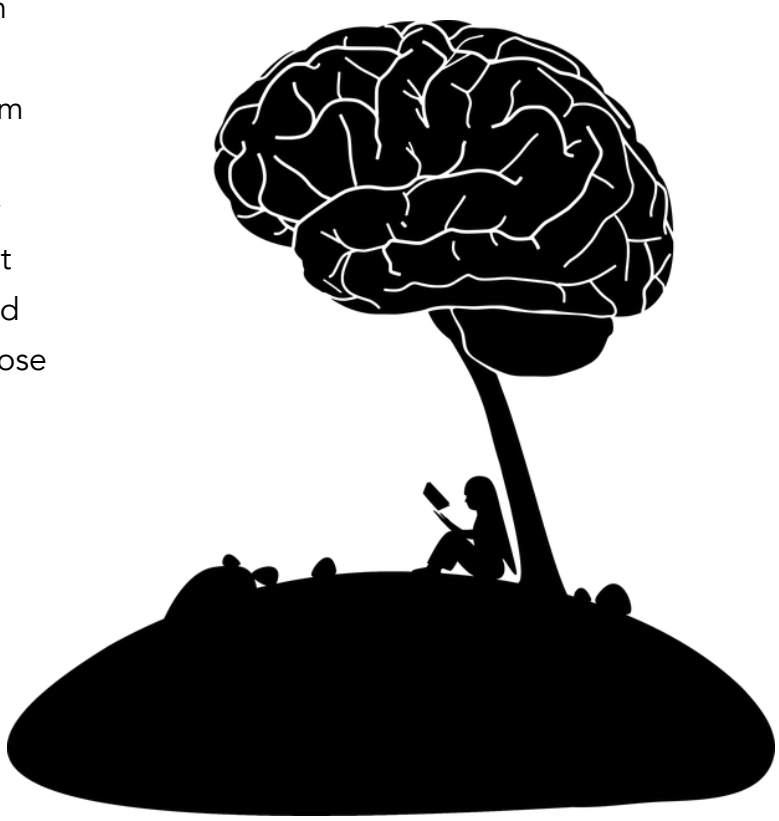
I am close to the BIG 5-0, and am I still learning? You bet I am. I think it's important to collaborate and learn from our colleagues. I hope to think I'm understanding growth mindset, and I am becoming more growth minded than fixed. I also hope to pass this on to my math students and develop the mindset that "you are never too old to learn, and you can be a lifelong learner if you choose to be one." ■



"I learned that making mistakes causes your brain to grow."

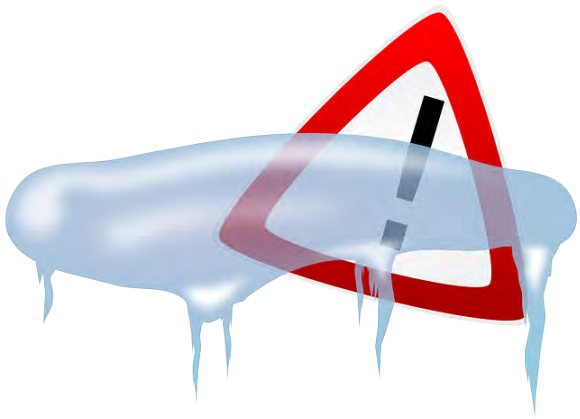
Does Having a Growth Mindset Influence Fluency?

By
Amy Caldwell

I remember when I was in elementary school taking timed multiplication, addition, subtraction, and division tests, glancing up periodically to see how much sand was left in the glass, frantically going from problem to problem, occasionally glaring at a math problem that I had memorized but temporarily going blank. I had memorized the answers, but had no "why," or scaffolding strategies. I had the equations memorized, but periodically I would freeze. I would think, "Why don't I know this?" I had a very fixed mindset. I either knew it or I didn't. I didn't have strategies to help. The way I memorized facts in the 70's was writing them over and over in columns, while priding myself in my progress in "around the world."

The term "from memory" is used in our math standards. This does not refer to rote memorization, but instead a deeper understanding of the structures of multiplication, division, addition, and subtraction. When a child simply has facts memorized, they can have a very fixed

WARNING: ROTE MEMORIZATION CAN CAUSE FREEZING!



"I had the equations memorized, but periodically I would freeze. I would think, 'Why don't I know this?'"

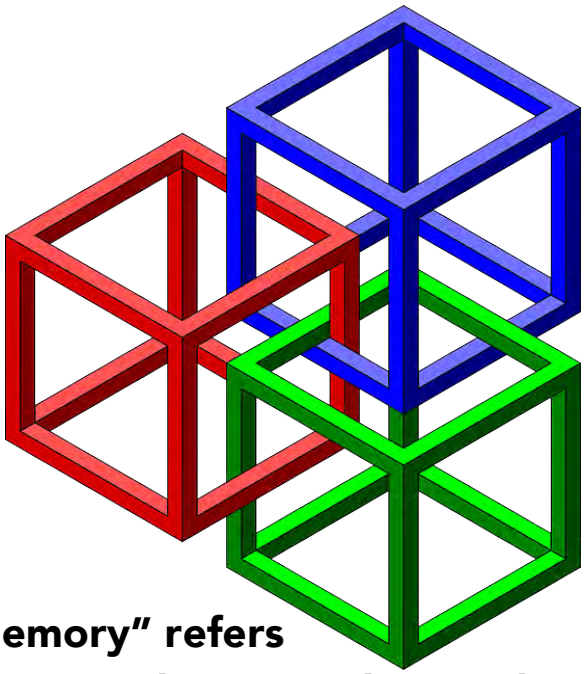
Continued on page 18.

Does Having a Growth Mindset Influence Fluency?

(continued)

mindset. Either they know it or they don't; however, children who have strategies tend to have a growth mindset. They will begin to look for a starting point, what they know, or a pattern. Students will begin to master them by applying their favorite strategies. Over time, the majority of students will turn them into memory.

■



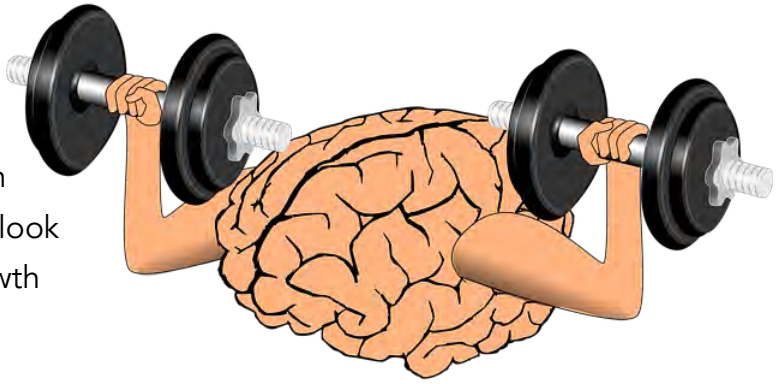
In math standards, "from memory" refers not to rote memorization but to a deeper understanding of the structures of multiplication, division, addition, and subtraction.

Having a Growth Mindset Classroom

By
Sherry Kilgore

As MathElites 2017 got underway, one of the first concepts presented to us was the idea of a growth mindset classroom or a fixed mindset classroom. As I began to think about just the words alone, my mind wandered to what these two very different classrooms would look like. Fixed mindset classroom, being the kind of classroom where there is only one way of doing things, and individual intelligence is praised versus a growth mindset classroom where students can explore, derive their own way of doing things, and celebrate the growth, even if the "right" answer is not found. Just with my thoughts on these two different classrooms, I knew which one I wanted to lead. I began to look at the research to see what a growth mindset classroom looks like.

According to Carol Dweck, the author of *Mindset: The New Psychology of Success*, success in school and almost every area of human endeavor can be dramatically influenced by how we think about our talents and abilities. People with a fixed mindset, those who believe that abilities are fixed, are less likely to flourish than those with a growth mindset, those who believe that abilities can be developed. Carol Dweck also said in her *Education World* interview, "This is something that really intrigued me from the beginning. It shows that being mastery-oriented is about having the right mind-set. It is not about how smart you are. However, having the mastery-oriented mind-set will help students become more able over time."



"Having the mastery-oriented mind-set will help students become more able over time."

Continued on page 20.

Having a Growth Mindset Classroom

(continued)

The good news: a growth mindset can be taught. Dweck found that when students undertook an intervention to move them from a fixed to growth mindset, they immediately began performing at higher levels and achieved greater academic success. It is our job as educators to incorporate these growth mindset-oriented learning processes in the classroom. What do these learning processes look like? In a growth mindset classroom, students are met with high standards and a nurturing environment. The old saying "students don't care how much you know until they know how much you care" applies here. We need to create an atmosphere where children feel safe to explore and make mistakes and where teachers encourage and care about the students. We also need to praise efforts and strategies as opposed to their intelligence. We need to help students focus on and value the process of learning, not just the grade they received. Lastly, we need to design lessons and classroom activities that promote cooperative learning rather than competitive or individualistic work. Research suggests that students are more motivated and successful working in groups. Students tend to feel a sense of responsibility to the members of their group to try their best.

As the new school year begins, I am challenged to be constantly aware of the mindset in my classroom. I hope to instill in my students that everyone can learn and foster an environment to make it happen. ■

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Complete application and return to Amy Glass with a check for $10 made payable to UETCTM. Mail completed application and check to:

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