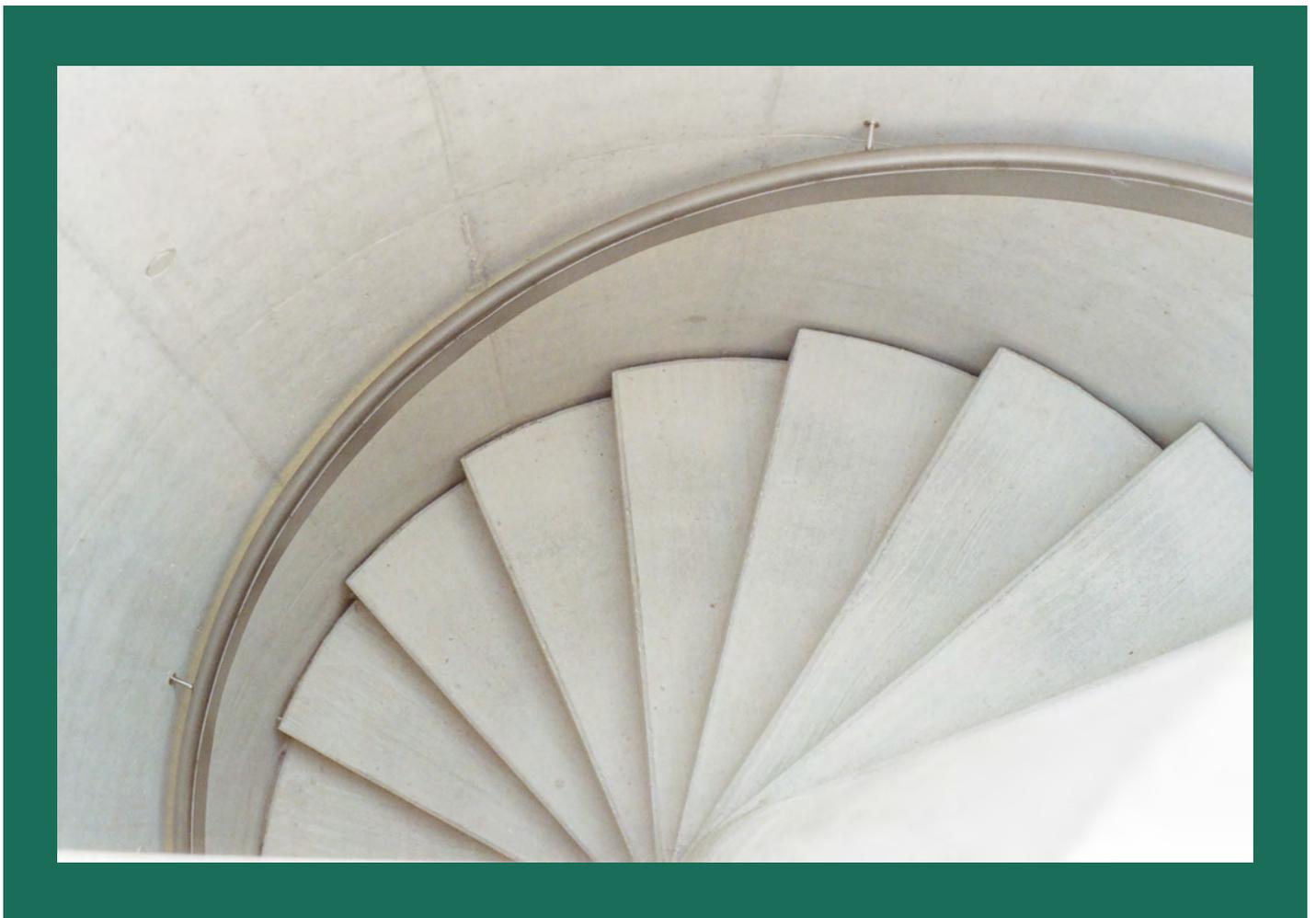


UPPER EAST TENNESSEE COUNCIL OF TEACHERS OF MATHEMATICS



IN THIS ISSUE:

Building Climate and Culture
in a Virtual World
Karen Duncan 2

Sticking with Teaching
Catherine White 3

The Answer is Correct, but What
is the Question?
Donna Reed 5

Do You Deliver Content or
Facilitate Learning?
Rachel Jones 7

Struggles to Successes
Kari Whisman 9

What Dimension Are We
Living In?
Mary Johnson 12



MEETINGS FOR 2020-2021:

Meetings begin with refreshments and informal networking at 4:00, followed by announcements and a brief business meeting, then sessions for all levels concluding at 6:00.

The next meeting will be held on February 16, 2021 at Daniel Boone High School.

OFFICERS FOR 2020-2021:

President:

Pam Stidham (Kingsport City Schools)
pstidham@k12k.com

Vice-President:

Tina Hill (Wahington County Schools),
dbhsmatteacher@gmail.com

Secretary:

Jill Burgner (Washington County Schools),
burgnerj@wcde.org

Treasurer:

Julie Tester (Kingsport City Schools),
jtester@k12k.com

Past-President:

Jamie Price (ETSU), pricejh@etsu.edu

NCTM Representative and Newsletter Editor:
Ryan Nivens (ETSU), nivens@etsu.edu

Assistant Editor:

Jamie Love (ETSU), lovej2@etsu.edu

Webmaster:

Daryl Stephens (ETSU), stephen@etsu.edu

NCTM
VIRTUAL



2020
CONFERENCE

Re-imagining Mathematics. Re-configuring the World.

**Wednesday to Saturday
November 11-14, 2020**

NCTM is committed to bringing the math education community together for engaging content that will help transform the learning and teaching of mathematics, and we have created a wonderful opportunity to do so! Join your colleagues for the NCTM 2020 Virtual Conference **November 11-14 and share in the excitement and love of math.**

The content you count on NCTM to provide will be in both prerecorded and live sessions each day. Our exciting online platform will provide opportunities for networking, small chat rooms, discussions with exhibitors and much more.

The sessions cover topics in four strands:

- **Access, Equity, and Empowerment**
- **Deep Mathematical Learning through Effective Teaching**
- **Actualizing Change**
- **Professionalism and Lifelong Learning**

<https://www.nctm.org/virtual2020/>

Building Climate and Culture in a Virtual World

by
Karen Duncan

For the past 24 years, I have taken pride in my classroom learning environment. I typically work all summer freshening up my classroom, redecorating, hanging wallpaper, building a fireplace and mantle and a cozy living room. I have received thousands of likes on my Instagram page, *ramblingthoughtsfromateacher*, for designing these wonderful spaces for my students to thrive. It's my thing. It's what I do well. My philosophy has always been the environment is the first step to building a climate of culture and respect for students. So, now what? How do teachers form connections with students virtually? If this is our new normal (at least for awhile), how do we make sure the climate of our online classroom is strong, respectful, and connected?



The first thing we need to do with virtual teaching is to make connections with every student. Take time to learn all your students' names before that first Zoom call. Look through an old yearbook if available to match names with

faces. Send a postcard or do a driveway home visit. It is important for students to know their teacher cares about them.

Secondly, go beyond the computer screen and learn what your students like. If they play soccer, you need to know that. If they enjoy dance, incorporate that into your online lessons. As the mother of two grown children, it was important for me to know my children's teachers took the time to know and appreciate something about them personally.

Lastly, make it a point to explicitly build connections with every student. One of the most powerful activities a teacher can do is a writing assignment called "I wish my teacher knew...". Many other activities can be used to build culture such a virtual talent show, scavenger hunt, and a class chant are just a few.

So even though our brick and mortar classrooms may be on hold this Fall, that doesn't mean our classroom climate and culture needs to take a back seat. By learning something about every student and going beyond the computer screen, we can calm the mind of parents and love our students from afar. ■

NCTM Trial Memberships

NCTM understands that these are difficult times and that teachers are looking for support and resources they can trust. Pass along this link to them and they will receive free trial access, including the publications and resources that come with an Essential Membership.

<https://www.nctm.org/trial-membership/>

Sticking with Teaching

by
Catherine White

As we all know, teaching is not easy. Many teachers quit within the first five years due to many reasons ranging from personal to political. One of the reasons I am going to highlight here is a silent struggle.

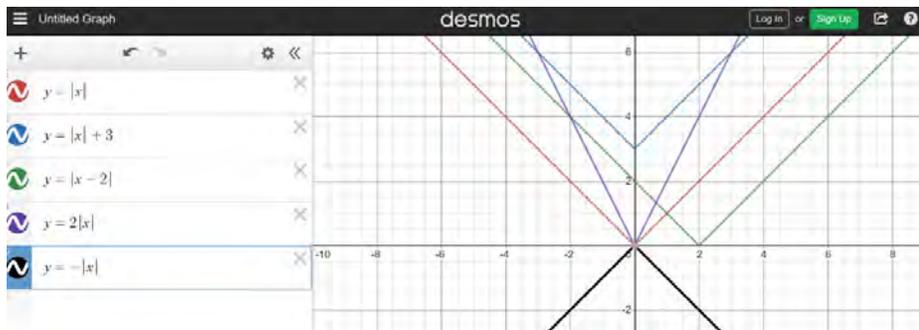
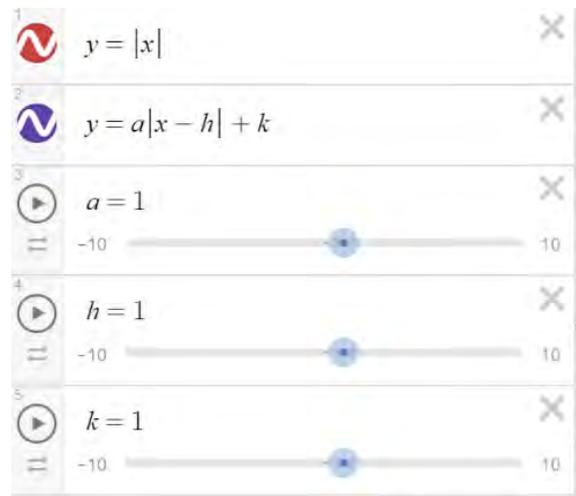
We all get into the profession of teaching for our own reasons, but the desire to shape students' minds is the basis. When we begin teaching we start with two things in mind: how we were taught and what we learned in college. There are so many great things that I try to incorporate in my teaching that helped me learn in school and get excited about the material. I have also used resources and materials that I was taught from education college courses. If you are lucky, your school also provides a mentor teacher to help you adjust to the new school. All of these things seem so great until you flop a lesson. The students don't seem to understand and there are misconceptions in the learning that turn the classroom management upside down. We feel like a failure and get frustrated with teaching. Unwilling to admit it, we keep it to ourselves and suffer silently. Feeling like a failure after all you have worked for and struggled through is not easy to overcome, but that perseverance is what strengthens a teacher. As teachers, we conquer challenges and obstacles daily to improve how we teach. When we learn about a "new" method for teaching or hear about an easy way to teach something it is not always the best method for you. Through the years you will start to see patterns in understanding and misconceptions

from the students and you learn what works best for you in your classroom.

I taught for 4 years in the high school teaching Algebra 1. The past 2 years I moved to the middle school teaching Algebra 1 to 8th graders. Over the course of my high school years I faced challenges in the students based on their background knowledge and attitudes towards math. Once I switched to middle school I found all new challenges with the younger students. One lesson in particular that I have struggled with teaching is Absolute Value Functions and Their Transformations. The way my pacing it set up, this is the first time that students learn about transforming a function. Later in the year we use the same concepts for exponential and quadratic functions as well. This concept is very new to them since they do not know what an Absolute Value function is nor have they learned about object transformations yet. Every year I have changed how I teach this lesson from guided notes, practice problems, to You Tube videos. Some students will get it right away and other students need more time. I would spend the whole class on graphing and transformation practice and some students looked at me like I was talking a foreign language.

This year I am very excited to revamp my lesson again by integrating technology in my lesson! Desmos.com has many features to graph, solve, and work through pre-made lessons. The tools I plan to use to introduce absolute value functions and their transformations is the graphing calculator. With this tool the students are able to explore and learn at their own pace by using the graph and controlling how it moves. I will start the introduction to this lesson with student input for changing the graph by adding values to the parent function. I will then move towards a "slider" feature to allow

the students to play with the program to determine the rules of transformations. It's hard to admit that we have troubles when teaching. It is a silent struggle as we navigate through the unknown misconceptions and the “best way” of teaching something. Every year we learn new things and better ways of doing it. There is no one best way of teaching. Find what works for you, be open to change, and STICK WITH TEACHING! ■



NCTM — Now More Than Ever

For the past 100 years, NCTM has supported the math education community, not just during unprecedented times like these but 365 days a year.

There has never been a more important time to renew your membership. You'll not only guarantee your continued access to NCTM's many resources, but you'll also remain a vital part of NCTM's vibrant worldwide community. Even if your membership does not expire this month, you can renew now and encourage others to join NCTM as well.

We are stronger together so we hope that you will renew today. If you know others that would benefit from membership, please urge them to join NCTM as well. Thank you for your continued support!

<https://www.nctm.org/membership/>

The Answer is Correct, but What is the Question? by Donna Reed

I wonder what the statistics are on how many students have said to themselves, during this past school year, “I could probably answer this if I knew what the question was.” I am sure that the number of instances of this is much higher than teachers would like to imagine.

As a Special Education teacher, I often realize the degree of a student’s deficit area that their Regular Education teacher may not initially perceive. Often students can memorize a list, or a set of facts or other information in the grade level curriculum. As educators, we understand that this can offer a false sense of mastery of material on the part of the student. For example, I often speak to a teacher about the fact that a particular student will need to practice their multiplication facts. Often, I am met with an initial look of confusion on the teacher’s face and then informed that the said student is “good” with their multiplication facts. Subsequently, in a relatively short period of time, I hear from the teacher that this student, “just cannot divide.” Upon collaboration between myself and the Regular Education teacher of the students evaluated work, the problem is, more often than not, the student has made several errors that relate to multiplication while attempting to work division problems. In other words, the student most likely did memorize his or her list of multiplication facts. Then when asked to demonstrate what is markedly the next progression, the student is struggling to master the concept.

Students must be able to understand why

they are doing what they are being asked to do in classroom as it relates to a specific skill, set of skills, or concepts. To further illustrate the situation that I have described in the previous paragraph, I have often asked a student to recite the product of three times four and then asked them to tell me the product of four times three, and they can answer correctly. Promptly, I have asked the same student to tell me what the quotient is if I divide twelve by three; the student often struggles to recite the correct answer. In this case, we see that the student may not have actually mastered the concept of multiplication, despite being able to recite all the facts of a multiplication table that any third-grade student may be required to do.

Other misconceptions that I often observe relate to place value. Many times, students can tell the teacher what place a named digit occupies in a specific number, but the student cannot give the correct answer when asked what value that same digit represents in the same specified number.

The ability of a student to manipulate, construct and deconstruct numbers is essential to that student’s ability to master higher level thinking skills and build upon foundational concepts. As educators, we have learned and must understand the importance of knowing how to assess the degree to which a student has mastered a skill or concept. Asking a student to communicate to you what is being asked of them in given set of directions or prompts is imperative to accurately assessing level of mastery. Teachers very often ask the students to recite the directions given to them to check for understanding of what is being asked of them. Simply reciting the directions does not indicate understanding. As a more accurate indicator of understanding; I feel that it is

much more productive for the teacher to ask the student what are these directions telling you to do. More specifically, can the student turn a statement in the directions into a question, or in other words, “what’s the question?” ■



The NCTM 2020 Research Conference, St. Louis, has been postponed from October 19-21 until April 19-21, 2021 in conjunction with the postponement of the NCTM Annual Meeting & Exposition to April 21-24.

In these changing and challenging times, the NCTM Research Committee is working hard to recraft and 2021 Research Conference to better support the individual, community, and collective needs and opportunities of the mathematics education research community. There is a clear desire to use this experience to strengthen the connections and collaborations within the community, to increase active engagement during and after the conference, and to collectively better understand current challenges and opportunities. The potential exists to increase the connections between research and practice at all levels and positively influence the impact mathematics learning has for each and every student.

<https://www.nctm.org/researchconf/>

Do You Deliver Content or Facilitate Learning?

by
Rachel Jones

Have you ever heard of student-led science experiments? I took a graduate course that focused on the importance of allowing students to drive science lessons. During MathElites this year, we read *Beyond Answers* by Mike Flynn. Flynn has provided me with a new challenge for this coming school year, student-led math lessons. I am a relatively newer teacher and I like constructive criticism and learning new ways that I can grow as a teacher. While reading this book, I discovered that I have been teaching math wrong all along. Now, I have not been teaching it wrong in a way that students leave my classroom and cannot add or subtract. I have been using the teacher-led approach the whole time.

I learned that you can really drive a student's learning by asking them questions. When students give you an answer, have them explain their reasoning. Math talk is huge for students who are developing math skills. They might not use the correct terminology but as Flynn said, "For young students, it is enough to talk about these structures using familiar language...MP7 is not about naming the structures, it's about seeing them and making use of them." (Flynn & Schifter, 2017) When students are talking in the classroom explaining and justifying their answers, they start to rely on each other and not just the teacher. When I am constantly giving the answer after asking a questions and 2 students get it wrong, I am really just hurting my students. I need to give more time for discussion and allowing them to

work through the problem as a class instead of jumping the gun and giving them the answer. I am letting them off the hook in terms of their responsibility. Another point made was that if the teacher is the one who is always talking and explaining math problems, we are taking away responsibility of the other students in terms of being active listeners during math discussions. It definitely takes more time to allow students to lead a lesson, but it can make a huge difference. I use to see myself as the instructor who showed my students how to do math, but my new goal is to become a teacher who facilitates learning instead of dictating it. I am going to try to take the extra time and ask more questions to drive students think mathematically.

Another area Mike Flynn has challenged me in for the upcoming school year is to hold back and not be so quick to discuss problems. During math discussions, when I ask a question and 2-3 students answer, I normally stop accepting answers once I hear the one I was looking for. This is not okay! I am taking away from the other students. Some might have the correct answers while others might have the wrong answer, but I should still give them time to explain how or why they come to this answer or conclusion. By allowing this to happen it can lead into another class discussion trying to figure out where the mistakes were made and help the child understand so they can fix it next time. I hope by sharing these challenges with you that you might think about your classroom, are you a facilitator or dictator. Aim to be a facilitator and let the students lead by discussion. ■

Flynn, M., & Schifter, D. (2017). *Beyond answers: Exploring mathematical practices with young children*. Portland, ME: Stenhouse.



As NCTM kicks off its next 100 years, the St. Louis Annual Meeting & Exposition will bring together members of the math education community from around the globe – classroom teachers; school, district, and state mathematics education leaders; administrators; mathematics teacher educators; mathematicians; and researchers – in a setting that encourages conversation, collaboration, and the sharing of knowledge.

You'll see and hear new ideas and approaches that will help you move forward and provide more and better mathematics instruction for each and every student.

**Wednesday to Saturday
April 21-24, 2021**

**America's Center Convention Complex
701 Convention Plaza
St. Louis, Missouri**

<https://www.nctm.org/stlouis2021/>

Struggles to Successes by Kari Whisman

As a teacher and parent, it is often difficult to allow students or our children to venture into a task without giving explicit instructions and lessons first. In education, a lot of teachers struggle with letting go of some of the control and direction as the teacher. So leaving our comfort zone and trying a new approach to teaching is something that can feel uncomfortable or strange at first. In collaborating with several colleagues this summer in MathElites, I have decided to try a new approach to teaching. This new approach is where the teacher gives the students some control and ownership of their education by allowing them to struggle on their own before the lesson is taught. Of course, the first few days will be explaining the process, the goals, the rewards, and getting to know the students. Establishing classroom expectations is always the best way to begin a new year whether in a traditional classroom or in an online classroom for remote learning.

My new approach was inspired this summer in the MathElites class that I took with Dr. Nivens, an education professor at East Tennessee State University. It is a program sponsored by Eastman Chemical Company to help Math and Science teachers collaborate with their peer teachers from the area and inspire them to improve their teaching methods.

The new approach to teaching that I am excited to try for the upcoming school year is called the “productive struggle” approach to a lesson. One resource to help with this

approach is in using the “Three Act” problems. This is a great way to approach this new method of allowing students to struggle and think on their own as well as within a group of their peers. Several math problems can be found on the website

www.whenmathhappens.com. This website includes many grade levels for math and allows the teacher to choose the topic. The Three Act lesson involves Act 1, the student is presented with a conflict or math problem to solve; Act 2, the teacher offers resources to the student to use after the initial struggling with Act 1 and offers leading questions to help guide their progress; and then Act 3, where the teacher checks the student or group progress and answers and reveals the actual answer to the problem in Act 1. The Three Act lesson plans are a great way to lead into a lesson and inspire the productive struggling approach for students.

The main definition found on www.stmath.com for productive struggling is “the process of effortful learning that develops grit and creative problem solving.” When students face problems they don't immediately know how to solve, this approach fosters a struggle within to solve and persevere through the problem. This approach also gives teachers new insights to a student's mindset or way of thinking. It is also a good time to praise new ideas and student perseverance in trying their best. It also helps with the creative thinking process to discuss with other students and explain their own processes.

The way I will incorporate this approach into my classroom will be using various websites and Three Act problems to draw the student interest and play as a hook into the lesson. When beginning a new lesson, the students are given a task related to the

upcoming lesson, and each student productively struggles with the task using their prior knowledge and background knowledge to formulate their answers. After a set time of 5 minutes, each student is then paired with a partner to discuss their answers and thinking process. The partners are given 8 minutes to discuss each other's answer and approach to solving the problem. When the timer goes off, the students then go to their assigned group of 3-5 students to further discuss each other's answers and strategies. The teacher roams around the room inspiring while asking leading questions to promote the students' discussion within their groups. After the group is content with their answer, then I will ask them to come up with another method to solve the same problem and discuss it as a group.

This new approach to allowing students to productively struggle without first giving instruction or the lesson plan will foster curiosity, encourage student intuition, inspire perseverance, help students retain and explain their thinking to others, and promote higher level thinking skills. Another aspect of

this new approach will improve the student's self-esteem and hopefully build their confidence in mathematics and in themselves. If we get students to discuss their ideas, share their thinking process, and learn to communicate their ideas with peers as well as teachers, then we are fostering strategies of problem solving that they can use in other classes as well as real world situations. Adding this new approach to a traditional classroom or an online classroom as we did this summer in MathElites will inspire students to better reasoning and problem solving. Hopefully this will also improve their Mathematical proficiency and improve their math fluency. One of my main goals in incorporating this in my classroom is to promote positive thinking and positive math learning so that students regain their confidence and LOVE or at least LIKE math again. If we can get our students to enjoy the challenge of problem solving in math again, then we will improve their math skills and successes. ■

2021 NCTM Annual Meeting & Exposition in Atlanta From Critical Conversations to Intentional Actions September 22 - 25, 2021

Strands:

- **Broadening the Purposes of Learning and Teaching Mathematics**
- **Advocacy To Make an Impact in Mathematics Education**
- **Equitable Mathematics Through Agency, Identity, and Access**
- **Building and Fostering a Sense of Belonging in the Mathematics Community**
- **Effective Mathematics Teaching Practices**

<https://www.nctm.org/annual/>

SPECIAL ISSUE CALL FOR MANUSCRIPTS



Digital Equity and the Digital Divide

Submission Deadline: **January 1, 2021**

Targeted Publication Date: **October 2021**

More than ever, access to technology and the knowledge to use it are important for mathematics teachers and their students. However, access to technology is not always equitable. The digital divide refers to the gap in opportunity to have access to digital resources as well as how those digital resources are used to support learning. Addressing the digital divide can help move us toward digital equity, in which both access to technology and the knowledge of how to use the technology are present for all members of the community.

The Editorial Board of *Mathematics Teacher: Learning and Teaching PK-12* (MTLT) invites submission of manuscripts that address digital equity in mathematics classrooms to be considered for publication in a special issue of MTLT. A full description of the special issue, with potential topics, can be found at https://pubs.nctm.org/view/journals/mtlt/mtlt-overview.xml?tab_body=SubmissionGuidelines.

What Dimension Are We Living In?

by
Sarah Babb

Dimension; what an interesting concept. It forces us to stretch our minds to wrap an understanding around it. The definition of dimension is a measurable extent of some kind, such as length, breadth, depth, or height. We ask our students to learn and memorize the names of certain 2-dimensional shapes and 3-dimensional shapes, but do we really ask them to grasp an understanding of the shapes? Do we ask them to break apart those shapes in their minds and manipulate the shape? Are we having them stretch their brains?

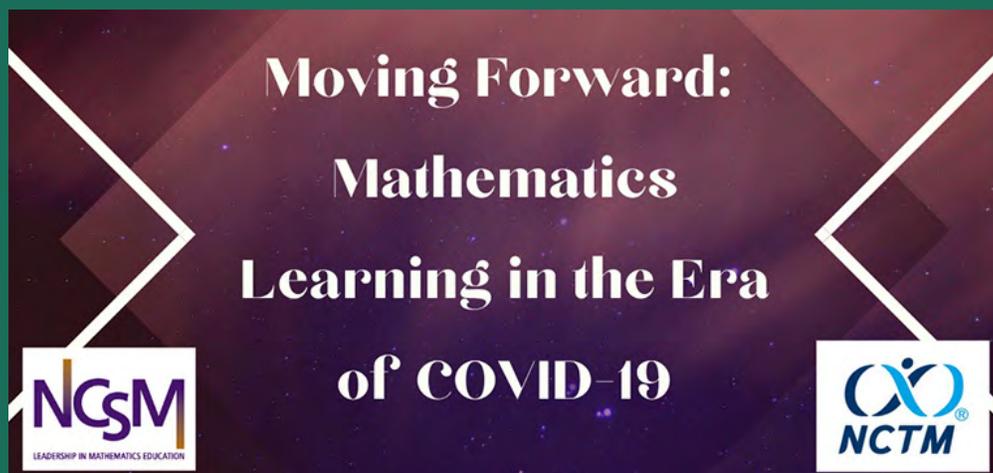
It is important to provide visuals for our students and show how to break down these shapes, show how they are related to other shapes, and show how they can transform them to become other shapes. When we do that, we are asking them to think outside of the box. Most teachers have lots of great manipulatives in the classroom to show our students the shapes and allow them to manipulate the shapes on their own. The challenge then becomes, how do we make it meaningful?

That is where we need to pull in the real-world connections. Get the toilet paper tube for a cylinder, then cut it up the side to make a rectangle, now calculate the surface area.... Or get the tissue box for a rectangular prism, then cut it apart to see how many rectangles and squares you have, then calculate the surface area. Now, how are we going to measure how much of something we can put in that box? Oh, and that has a name, volume. The possibilities explode when you start bringing in

real world connections. Now we are not only relating it to geometry but measurement as well. We are forcing our students to manipulate the object to see other possibilities.

We all know one of the best practices in teaching math is to have our students continually practice what we are learning. In my classroom it is $\frac{1}{4}$ of me teaching a new skill, $\frac{1}{4}$ of them practicing the new skill, and $\frac{1}{2}$ of them practicing old skills. The challenge becomes how do I make the practice fun and meaningful and not boring work. Technology offers great websites with fun games for practice, but we can't only have them staring at a screen, we need them using their hands. One great idea I learned from my MathElites instructor, Tara Peters, is to have LEGO sets with instructions. Have the students build LEGO sets by following instructions. They are forced to look as a 2-dimensional picture and build a 3-dimensional shape. They are figuring out how these shapes relate to each other and using their hands to build something. They will be practicing math without realizing it, which is what we as math teachers strive to show our students, that math is fun!

I challenge you as a teacher to make your students' brains stretch with real world connections. Force them to manipulate shapes and see new connections. It is exciting for the teacher and the students. To wrap up my question from the title, what dimension are we living in? The answer is we live in a 4-dimensional world. That is, we live in a world filled with 3-dimensional objects, but our fourth dimension is a measure of time. So how are we going to use that measurement of time that we have with our students to show them that math really is fun? ■



**"We live in uncertain times. Public health is at the forefront of our minds, and our schools have been disrupted in ways we have never seen. Although no one can predict how education might look in the coming months, it is in the best interests of our students to strategize how we might best meet their needs in the upcoming months."
-NCSM and NCTM 2020**

NCSM and NCTM have published a joint document to provide guidance for mathematics teachers and leaders at all levels to make informed decisions for next steps due to COVID-19. Moving Forward presents considerations, questions, and potential solution processes to educators and school leaders to address the challenges induced by the COVID-19 pandemic of spring 2020.

<https://www.nctm.org/Research-and-Advocacy/Moving-Forward---NCSM-and-NCTM-Joint-Statement/>



**Upper East Tennessee Council of Teachers of Mathematics
Membership Application for 2020-2021**

Complete the application and return to the address below with a check for \$10.00 made payable to UETCTM.

Sevier Middle School
C/O Julie Tester-UETCTM
1200 Wateree Street
Kingsport, TN 37660

Name: _____

Home Address: _____

Home Phone: (_____) _____ - _____

District: _____

School: _____

School Address: _____

School Phone: (_____) _____ - _____

Email Address: _____

UETCTM may be asked to share your information with other math organizations (NCTM, TMTA, etc.) that promote mathematics education.

Please check the following statements if applicable:

Please check if you do NOT want your information to be shared.

I am a current member of NCTM.

I am interested in leading/presenting a session at UETCTM.

I am interested in holding a leadership position with UETCTM

Membership dues are for July 1, 2020-June 30, 2021.