Annual Winter Conference

By Jelena Komitas

The annual winter conference was held on February 7th, and the theme was “Fostering Growth Mindsets in Every Math Classroom: Creating Productive Learning Environments.” The event brought together over 300 math educators and leaders to share their passion for mathematics, discuss challenges they face every day, exchange ideas, and of course network! Despite winter weather, we had presenters from California, New York, Maryland, Pennsylvania, and New Jersey. The presentations covered a wide range of topics from balancing equations and number talks in the primary grades to redesigning PreCalculus and Computational Geometry in high school. The common thread of all presentations was making mathematics more accessible and meaningful to ALL learners.

Right before lunch, we all gathered in the Grand Ballroom for the keynote speech delivered by Dan Meyer, the Chief Academic Officer at Desmos, on full stack teaching. One attendee wrote that his keynote was “inspiring, engaging and informative.” Another stated that “I want to teach like that every day.” Below is a selection of tweets from attendees of Dan’s keynote:

Many walked away feeling inspired by the content, speakers, and the conference overall. Using words of a conference attendee it was “a great day of engaging math.” @amtnj #amtnj2018.
President’s Message

Welcome to Summer

by Tom Walsh

Welcome to Summer 2018, and I’m very glad to speculate that we will not have any more wet snow events that bedeviled us in March. We started off the year with a great winter conference which was held on Wednesday, February 7th, at the Ramada Plaza in Monroe, NJ. We were very fortunate to have Dan Meyer, chief academic officer of Desmos deliver our keynote address, after which he gave a Desmos workshop. There were over 30 other presentations for all grade levels, and for administrators and teacher educators, too.

We had a job fair on Saturday, April 7th, at Kean University in Union, NJ. Kean’s Provost, Dr. Jeffrey Toney, and the College of Education Dean, Anthony Pittman, were most gracious in offering the classrooms and breakfast refreshments for it. There were over 20 school systems represented looking for teachers, in all three areas of schooling: public, charter, and private. Over 40 teachers came, schools and teachers alike considered it a great success, and participants expressed a desire to hold a similar event next year.

The Precalculus Conference was very nice. It was held on Friday, March 16th, at Rutgers University. The NCTM Annual Meeting and Conference was held in Washington, D.C., and was attended by many of our members. I presented a workshop on navigation among Polynesian seafarers and later used by European explorers (in the 18th – 20th Centuries). I was assisted by Stephanie Cooperman, our president-elect. Stephanie also represented us as a delegate to the Affiliates’ meeting. Neil Cooperman (past-president and alternate delegate) assisted Stephanie in the meetings that were designed to solicit ideas from affiliate organizations.

Our second vice president, Mark Russo, was there, as well, attending many great presentations.

Have a productive rest of your year, and a restful summer. We hope to see you in the summer for one of our fine workshops, and for our 2-Day Conference on October 25 – 26 at the National Conference Center at the Holiday Inn in East Windsor, NJ.

Left: Tom Walsh presenting Dan Meyer with a plaque of appreciation at the Winter Conference
This Year’s Conferences

Above: Neil Cooperman, AMTNJ co-treasurer; Diana Sopala, AMTNJ Executive Coordinator – Teacher Outreach; Jelena Komitas, AMTNJ 1st Vice President and Conference Chair; Tom Walsh, AMTNJ President; Dan Meyer, keynote speaker; Stephanie Cooperman, AMTNJ President-Elect; Mark Russo, AMTNJ 2nd Vice President; Makoto Yoshida, AMTNJ Immediate Past President

Above: Attendees engaged in Dan Meyer’s keynote “Full Stack Teaching”

Below: Tom Walsh, Stephanie Cooperman, and Neil Cooperman at the NCTM Annual Conference

Above: Linda Treiman, Mark Russo, Susan Landers, and Roy Eismann at the Precalculus conference

Above: Makoto Yoshida presenting a plaque of appreciation to Toby Karten, with Neil Cooperman and Stephanie Cooperman
Since the publication of the last newsletter two years ago, AMTNJ honored two mathematics education leaders — Dr. J. Michael (Mick) Nuspl and Agnes (Aggie) Azzolino — with its most prestigious, individual recognition, the Max Sobel Award for Outstanding Service and Leadership in Mathematics Education. Mick and Agnes are the 27th and 28th recipients of this award, respectively, following in the footsteps of the first recipient, Dr. Max Sobel.

**Mick Nuspl** began teaching grades 7 – 12 mathematics in Ohio after his graduation from Kent State University. After receiving his MA in Mathematics from Bowling Green State University, Mick taught mathematics at Wayne Hills High School and assisted in in-service training for the Wayne Township District for ten years after serving as the district intern supervisor in 1968-1969. Mick subsequently supervised mathematics at the Morris Hills Regional District, served as director of Natural Sciences K-12 in Pearl River, NY, and served as K-12 Supervisor of Mathematics for the East Orange School District, for a total of over twenty years. He then served as a math specialist/tutor for Creative Dimensions, serving students one-to-one from 1997 through 2008. During this time period, Mick also supported pre-service and in-service teachers at both Kean University and Montclair State University in his role as adjunct professor. His teaching and experience is well-documented with outstanding evaluations and endearing notes and letters from students, parents, faculty, and administrators from every place, heart, and mind he touched.

Mick completed his Ed.D. in Mathematics Education at Columbia University in 1975, and he served as AMTNJ’s 66th President from 1979-1980. Mick has participated in many distinguished, collaborative ventures in his service at virtually every level and position in AMTNJ for almost five decades. For example, during his tenure as President-elect, Mick held the first Women in Mathematics Conference during the AMTNJ Winter Meeting to honor Women in Math Day, January 21, 1978 (rescheduled due to a huge snowstorm)! For the past several years, Mick has served as the AMTNJ Historian, where he has gathered an archive of programs, pictures, flyers, buttons, and other memorabilia for the comprehensive completion of the first 100 years of AMTNJ. The project culminated in a presentation during the Centennial Conference in 2014, with several showings at subsequent conferences and meetings. Mick has continued this work by creating, and regularly contributing to “Tiny Treasures in AMTNJ’s History,” which can found on the [AMTNJ website](http://www.amtnj.org). Mick has stored and garnered artifacts at his own expense, spending countless hours cataloging, printing, and scanning archives that are now placed in the Special Collections Library at Rutgers University in New Brunswick.

**Agnes Azzolino** has served the mathematics education community in countless areas – as a high school teacher, a county college teacher, a member of and contributor to AMTNJ, NCTM, NJEA, AMATYC, MAA, and MATYCNJ, an author, a presenter, and the founder of [mathnstuff.com](http://www.mathnstuff.com) – just to name a few. She chaired the NCTM Task Force on Mathematical Literacy for Adults and coedited NCTM’s best seller “Mathematics and Humor.” Professor Azzolino has served as MAA-NJ Vice President for Two-Year Colleges, twice served as MATYCNJ President, and received the MATYCNJ Outstanding Service Award. In 1997, she was in the first class that received the national AMATYC Award for Teaching Excellence.

In addition to serving as the 89th President of AMTNJ, Agnes served as a member at large, chairperson of the sign committee, College Liaison, and chairperson of Workshop Support. In addition, Agnes served as a reviewer for the AMTNJ Mathematics Teacher and authored ten articles and four covers. She was a writing team member and the illustrator of AMTNJ’s “Problem Solving Activities Made to N-joy,” and she’s twice been the AMTNJ webmaster—one before and once after her presidency. The books Exploring Functions through the Use of Manipulatives, Math Games for Adult and Child, Math Spoken Here!, The Hundreds Board, and Term Tiles & Tokens are found free on her website. She is proudest of these and the thousands of web pages and resources posted free on mathnstuff.com. And she is proud of the growth of the thousands of students and teachers she has influenced.
Each year, AMTNJ presents the Max Sobel Outstanding Mathematics Educator Award at its Annual Two-Day conference. This award is given to an individual who has contributed to mathematics education in New Jersey.

Nominations are now being taken for the 2018 Max Sobel award. If you know of someone who has worked over the years to further New Jersey mathematics education, we ask you to:

1. Write a letter of nomination that includes name, address, and brief biography of the nominee that shows evidence as to why the person deserves to be considered for the Max Sobel Award. Include your name and contact information with the nomination.

2. Forward your correspondence to: yoshida112358@yahoo.com and note Max Sobel nomination in the subject line.

AMTNJ Max Sobel Outstanding Mathematics Educator Award Past Winners:

Special Education and Mathematics Conference

by Stephanie Cooperman

AMTNJ presented the 9th Annual Special Education and Mathematics Conference on Wednesday, December 6, 2017 at the Ramada Plaza Hotel and Conference Center, Monroe Township, New Jersey. The theme for the conference was Special Education and Mathematics: Perfect Together! There were 175 attendees, speakers and volunteers. Topics that were featured included:

- Fostering and maintaining the co-teaching relationship
- Working collaboratively in an inclusion classroom
- Meaningful problem-solving utilizing puzzles and manipulatives
- Using technology for differentiating instruction
- Brain-based learning and efficient strategies to maximize learning
- The Growth Mindset and its implementation in an ICR math setting
- Collaborative teaching to model thinking for students working in groups

The Keynote Speaker was Toby J. Karten, an inclusion coach, educational consultant, author, professor, and consummate collaborator. Her teaching background involved populations of learners ranging from preschool to graduate level. The keynote address was entitled “Effective Mathematics Intervention: The Collaborative GE and SE Algorithm.” During the presentation, Ms. Karten employed many scenarios showing how collaborative efforts between general and special educators maximized effective mathematical engagements among students and teachers. She discussed appropriate accommodations and connections to support the Common Core Standards for Mathematical Practice, including:

- Activity centers for independent and cooperative work
- Strategy tables with manipulatives to solidify abstractions
- Opportunities to play with concrete and virtual manipulatives
- Variations in pacing and feedback to check for understanding
- Think-aloud math discussions/debates in a non-threatening setting
- Sets of problems that could be sorted into similar categories/patterns
- Encouraging students to critique their answers through peer discussion
- Connecting math to personal interests, school, home, and community

The feedback by the attendees was overwhelmingly positive; many participants stopped by to thank us and to tell us what a great conference it had been! The speakers were rated very high, and Evaluation Forms included comments such as:

- “The conference provided an excellent opportunity to revisit some strategies I already knew and also provided new strategies that I was not familiar with.”
- “I definitely enjoyed the conference and I am glad that I am taking something to share with my colleagues.”
- “Thank you to the organization team. Every year I attend the conference and speakers are relevant to current trends and topics for Special Education.”
- “What a wonderful opportunity for us to collaborate with fellow mathematicians and Special Educators that are doing and performing best practices. Time well spent!”
Scholarship Winners

by Joan Vas

For the 2017-2018 school year, AMTNJ awarded a $3,500 scholarship to two students. This year’s awardees are Hunter Romanko, Cedar Grove High School, sponsored by our 1998 awardee, Janine Miscia Barboza, Cedar Grove School District K-12 Math/Science supervisor, and Karen Villagomez, Passaic Valley Regional High School, sponsored by Dr. Janice-Lynn Shuhan, Passaic Valley Educational Consultant.

Hunter Romanko will be attending Boston University in the fall. Hunter wrote in his essay that “the uphill climb to make sense of math has given me a great appreciation of mathematics. A good teacher can really alter the way a student sees and digests a specific subject. A lot of students think that they don’t have minds for math, and that simply isn’t true. Every student is different and thinks differently, so a typical approach to math that isn’t working will make them believe that they don’t like math. If taught in a way that makes sense to them, a teacher will observe a world of difference in how students perform in class and their perception of the subject.” Mrs. Barboza wrote in her letter of recommendation that “Hunter was either the benchmark or the outlier for every math class – a student repeatedly commended and spoken of with high regard. While he is strong in many academic areas, his interest in teaching math has clearly emerged this year and we couldn’t be more proud.”

Karen Villagomez will be attending Rider University in the fall. Karen wrote in her essay that “I’ve always had a strong passion for becoming a teacher. I always seemed to work very well with younger children and to be able to provide them with their first steps in education. I consider it to be an honor.” Karen will have a dual major at Rider: mathematics education and elementary education. Dr. Shuhan wrote in her letter of recommendation that “Karen is self-started, well organized, and is admired by her peers. Her love for tutoring both her peers and helping out younger children (volunteering with the Paterson Boys & Girls Club with children ages 5-12) displays the qualities of a dedicated and compassionate teacher. She is a credit to Passaic Valley Regional High School, her peers and her community.”

Special thanks to the Scholarship Committee: Tom Walsh, Stephanie Cooperman, Neil Cooperman, Agnes Azzolino and Joan Vas, Executive Coordinator of the AMTNJ Scholarship Committee. This is the 22nd year that AMTNJ has awarded scholarships to graduating high school seniors interested in a career in mathematics education, and 58 candidates have received this initial scholarship. Awardees are contacted for the next three years and given the chance to apply for a renewal scholarship. Thank you to the AMTNJ Executive Board and the AMTNJ membership for their continued support of this program. Special thanks to President Tom Walsh for his generous support of the program.
AMTNJ has presented annually a High School Mathematics Contest and in 2012 it presented its first annual Middle School Mathematics Contest. There was no limit on the number of students from each school who could participate. However, only the top five students would comprise the “School Team.”

Topics ranged from Pre-Algebra to Precalculus for the High School Contest, and sixth grade mathematics through Algebra I for the Middle School Contest. Calculators were permitted for a section of the assessment, but support materials and collaboration were not allowed. Previous contest questions and answers were available on the AMTNJ website for review purposes, and students were encouraged to work together on these problems in advance of the contest.

The results for the both the High School Contest and the Middle School Contest are posted on the AMTNJ website. The “slider” on the first page has links that describe, in detail, all the winners for this year’s contests.

The AMTNJ 41st Annual High School Contest Team Results include: Overall State Winners, Delta Section (fewer than 750 students), Pi Section (between 750 and 1,250 students) and Gamma Section (more than 1,250 students). Also listed are the AMTNJ 41st Annual High School Contest Individual Results, the 6th Annual Middle School Math Contest Team and Individual Results. Trophies, plaques, Certificates of Merit, and Certificates for Participation were sent to all schools.

Congratulations to all the schools for your achievements in this year’s contests. We look forward to your participation in the High School and Middle School Mathematics Contests for 2018.

**AMTNJ 2017**

**High School Contest Winners**

1st Place: West Windsor-Plainsboro South  
2nd Place: West Windsor-Plainsboro North  
3rd Place: Union County Magnet High School

**AMTNJ 2017**

**Middle School Contest Winners**

1st Place: Pond Road Middle School  
2nd Place: Warren Middle School  
3rd Place: Linwood Middle School
Special Education Corner

by Dr. Julie Norflus-Good

While I was walking down the hall of an elementary school building a few weeks ago, there he was flanking two sides of the hallway. What appeared to be at least 50 plastic alien-looking recyclable robots were lined up side by side. As I got closer I smiled, because this alien I knew: Liquid Larry™. He is a “guy” with a head that is a funnel leading to a torso that is a milk gallon container and the arms and legs made of containers that are quarts and pints and toes and fingers that replicate cups. While building his gallon torso, the remaining configuration makes it simple to actually follow the relationship between cups, pints and quarts.

Interestingly, two children with a pass stood there talking to each other about Liquid Larry™. Of course, I had to stop and eavesdrop. I recognized them as they were in one of the inclusion classrooms that I had visited. One was a student with an IEP while the other one was a general education student. An intense theoretical second grade conversation was emerging. They spoke about how the body led to legs and then to the feet and then to the toes. The real-life carton and jug shapes allowed students to easily recognize the various units of liquid measurement as containers they see in everyday life. They were able to transfer their knowledge of real life materials (the milk and orange juice containers they had used during breakfast time) to what they saw on display. After gawking at the 2 cups the student with special needs realized that this is what led to the 1 pint. I started to tear up. WOW!

How often we take learning for granted. This simple hallway display that many teachers begrudgingly complete, and some see as just one more task to do is much more than that. We need to think differently about the benefit of hands-on projects and realize that these can inspire many teachable moments for all learners.

These two little second graders were on their way back from completing an errand for their teacher, but more importantly, they were on their way to understanding liquid measurement!
As our global society continues to evolve, so must our instructional approaches if we are to prepare students for the future. Embedded in this evolution is the rising demand for collaborative skills, with publications from Forbes continuously placing teamwork and collaboration as sought-after competencies (Adams, 2015; Strauss, 2016). Beyond our responsibility to prepare students for future success in the job market, advances in neuroscience have prompted new insights into effective instructional methods, revealing that the social circuits in the brain are closely linked to those responsible for making meaning, and thus, should be a central source of learning (Kirylo, 2016). Further, collaborative problem-solving in math has been found to improve mathematical attitudes and achievement (Boaler, 2016; Cohen & Lotan, 2014; Dweck, 2006).

The New Jersey Student Learning Standards for math, drawing on the tenets of the National Council of Teachers of Mathematics (NCTM, 2000), highlight the aforementioned need for social interaction in mathematics, specifically through Mathematical Practice Standard #3: Construct viable arguments and critique the reasoning of others (NJDOE, 2016). And, if you have delved into instruction that targets this peer interaction, you have likely experienced the challenges that come along with it. So, how do we overcome these challenges in order to reach our visions of mathematical collaboration? Consider the following reflective questions and instructional moves:

**Has a growth mindset climate been established?**
- While a fixed mindset — the belief that skills and intelligence are set — leads to a competitive culture, a growth mindset — the belief that skills and intelligence are plastic and can be developed — encourages collaboration. In a growth mindset climate, students see the successes of others as success for the team; rather than being envious of another’s achievement, students see this as an opportunity to learn from a peer. This dynamic is essential for true collaboration to occur.
- **The move:** Begin your year with a launch into growth mindset culture, pulling in resources from YouCubed.org and Class Dojo.

**Do students know how to collaborate?**
- Establishing norms and expectations for collaboration is key, but it is crucial that these norms are identified by the students themselves.
- **The move:** Using tasks such as “Broken Circles,” developed by Graves and Graves (Cohen & Lotan, 2014), guide students toward discovering collaborative norms, such as attending to everyone’s needs. [Whennathhappens.com](http://Whennathhappens.com) provides access to this task. “Broken Circles” can also be found in Designing Groupwork: Strategies for the Heterogeneous Classroom by Cohen and Lotan (2014), which contains additional activities for teaching groupwork strategies.

**Is the task groupworthy?**
- Groupwork should be purposeful, not merely an added requirement to meet a practice standard. Asking students to work in groups when the task is not actually groupworthy typically leads to independent problem-solving with a quick share-out of solutions, or worse, relying on one member to complete all the work.
- **The move:** Groupworthy tasks should have high cognitive demand, necessitating multiple brains to attempt to solve. These are not procedural tasks, but rather, conceptual explorations or demanding applications that elicit productive struggle. Further, all students need to be able to access the task, which may require strategic scaffolding in breaking the task into a progression of stages.

**Are students grouped effectively?**
- Breaks in collaboration often arise as a result of a disparity in pacing. It is advantageous for students to be heterogeneously grouped, as the lower-performing students benefit from mathematical communication with and guidance from higher-performing students, and the latter benefit from
the extended reasoning necessary for this articulation (Boaler, 2016); however, pairing students at opposite ends of the performance spectrum typically leads to pacing disparities as students move through the tasks at hand at varying rates.

- **The move:** The below diagram presents a suggested mix between heterogeneous and homogeneous pairing:

![Diagram showing heterogeneous and homogeneous pairing]

If students are still developing basic collaborative skills, it may be best to begin with partnerships and then have students share across partnerships to scaffold to group collaboration.

**Do students have the necessary language?**

- Providing students with language supports often helps prompt their participation in group discussions.

- **The move:** Follow this QR code to access a progression of ‘math talk’ prompts for early childhood upper grades. It is recommended that these prompts be introduced with low-risk math tasks (i.e. those with multiple solutions) that encourage discussion. You may also want to build a math word wall with content-specific vocabulary in focus.

**What is your role as a facilitator?**

- Although collaborative math tasks take the focus off of the teacher, the role of the educator as a facilitator holds high importance in guiding and promoting meaningful math conversations.

- **The move:** In *Five Practices for Orchestrating Productive Mathematics Discussions*, Smith and Stein (2011) share instructional approaches in facilitating math collaboration. These techniques include anticipating pathways for solving and struggles that may arise, monitoring student work and prompting students in their problem-solving, selecting students to share out to the whole group based on the strategies they employed, purposefully sequencing the order of the strategy presentations to the class, and making connections across the strategies presented.

While it may not always be a smooth journey, the pathway toward collaborative problem-solving is one of value and can be effectively navigated through reflection and accompanying instructional shifts.


High School

by Mark Russo

In April 2018, at its Annual Meeting and Exposition in Washington, D.C., the National Council of Teachers of Mathematics (NCTM) released Catalyzing Change in High School Mathematics: Initiating Critical Conversations. The executive summary states the following:

The need for Catalyzing Change is clear: The steady improvement in mathematics learning seen since 1990 at the elementary and middle school levels has not been shared at the high school level, underscoring the critical need for change in mathematics education at the high school level (National Council of Teachers of Mathematics (NCTM), 2018).

The purpose of this text is to engage critical stakeholders in discussions about the unique challenges faced by high school mathematics education. After discussing the purposes of mathematics education, Catalyzing Change offers four key recommendations.

1. Each and every student should learn the Essential Concepts in order to expand professional opportunities, understand and critique the world, and experience the joy, wonder, and beauty of mathematics. Catalyzing Change presents forty-one critical concepts that students should know and understand by the time they leave high school. While these concepts will prepare students for future math courses and career opportunities, they have also been selected because they can help students understand and critique the world and experience joy, wonder, and beauty.

2. High school mathematics should discontinue the practice of tracking teachers as well as the practice of tracking students into qualitatively different or dead-end course pathways. Research in the field of mathematics education has clearly and consistently shown that student and teacher tracking both serve as significant barriers to meaningful mathematical learning for all students. Catalyzing Change encourages stakeholders to consider how best to eliminate these practices to allow for more equitable outcomes.

3. Classroom instruction should be consistent with research-informed and equitable teaching practices. A previous NCTM publication, Principles to Actions: Ensuring Mathematical Success for All, outlined eight research-informed mathematics teaching practices, and Catalyzing Change takes the next step by outlining how these practices support students’ identity, agency, and competence.

4. High schools should offer continuous four-year mathematics pathways with all students studying mathematics each year, including two to three years of mathematics in a common shared pathway focusing on the Essential Concepts, to ensure the highest-quality mathematics education for all students. Catalyzing Change challenges stakeholders to create a common pathway to ensure a high-quality curriculum for all students, and to provide rigorous, compelling options so that students can take four years of meaningful mathematics.

Catalyzing Change is a bold document, and it presents a challenge to many established institutions and practices in mathematics education. It is essential that we take these recommendations seriously, and engage all critical stakeholders in a discussion of how best to support meaningful mathematics teaching and learning for all students.

In mathematics class, there are times when we snorkel through ideas and times when we deep sea dive. In Visible Learning for Mathematics, Hattie, Fisher and Frey have devoted a chapter to each type of learning: Chapter 4, Surface Learning, and Chapter 5, Deep Learning. In middle school, it is important to provide many opportunities for our students to struggle and experience deep thinking. The earlier students can build the brain pathways to facilitate productive struggle, the more confident they will feel about their mathematical journey.

Robert Kaplinsky provides a great structure for thinking about conceptual understanding. He has posted Depth of Knowledge (DOK) charts on his website. Here is a sample of what you can find:

DOK Level 1 problems require little mental effort besides remembering and applying a procedure. Word problems can be Level 1 if they are scaffolded and provide prompts that make the necessary procedure fairly obvious. DOK Level 2 problems require a strategy. There are multiple ways to approach the problem and many attempts are required. The quantity of solutions can open a discussion about patterns. DOK Level 3 problems ask students to optimize their solutions. In my class, this naturally leads to sharing solutions and discussing best methods to attack the problem.

All types of learning are important. However, scuba diving with your students is immensely rewarding. Their rich conversations help you understand their thinking and correct misconceptions that surface. It is an amazing way to see what students know, and not just what students can do. Check out Robert Kaplinsky’s website – [https://robertkaplinsky.com/](https://robertkaplinsky.com/) – for more information and examples, and directions to help you create your own problems.
To be a math person or not to be a math person? That is the question. Or is it? Mathematical Mindsets by Jo Boaler suggests that everyone is a math person! Boaler explains that math is not dull and dry like some of the negative stereotypes, but can be colorful, creative, social, and open to everyone.

The author, Jo Boaler, is a Stanford researcher, professor of math education and an expert on math learning and instruction. Boaler shares the latest brain research and how the findings support a growth mindset for learning. A common misconception is that people are born with a fixed intelligence, but this has been disproved. The brain is a muscle and has the ability to grow, which is known as “brain plasticity.” The research shows that the brain can form new neural pathways and create neurons even in adulthood! No one is born knowing math or with a math brain. Everyone has the ability to learn and can learn math to high levels! As teachers of young mathematicians, this is what we want to focus on.

Boaler emphasizes the importance of making mistakes and facilitating productive struggle in the classroom. When the brain has to struggle, this is the opportunity for your brain to grow the most. When someone makes a mistake, the brain has two responses. The first, ERN response, is increased electrical activity when the brain experiences stress between a correct response and an error. The second response, Pe, is a brain signal reflecting conscious attention to mistakes. Each time a student makes a mistake in math, they grow a synapse in their brain to form new neural pathways. Boaler encourages us as educators to value mistakes in our classrooms. One of Boaler’s suggestions is to teach students that mistakes are perfect opportunities for learning and brain growth. If students are graded for math work and they are penalized for making a mistake, then they will receive a negative message about mistakes and learning (Boaler, 2016). Teachers are encouraged to allow students to revise assignments to improve their grade with a note attached explaining how mistakes can grow the brain. Revision and feedback to students allows the student to focus on the learning rather than a final grade.

Engaging students in mathematics is essential. Boaler suggests many ways teachers can bring more excitement to rich tasks. Boaler suggests opening tasks to encourage multiple methods, pathways and representations. It is important for teachers to ask students to make sense of their solutions. Reasoning is at the heart of mathematics. A recommendation from the book invites students to be skeptics. Challenge students to convince yourself, convince a friend or convince a skeptic. Feel free to try it out with the suggested Mark Driscoll paper folding task. The text also suggests the following websites to support engaging, rich, open tasks:

- Youcubed: https://www.youcubed.org/
- NCTM: www.nctm.org
- NCTM Illuminations: http://illuminations.nctm.org
- Math Forum: www.mathforum.org
- Dan Meyer’s resources: http://blog.mrmeyer.com/
- NRICH: http://nrich.maths.org/
- Mathalicious, grades 6-12: http://www.mathalicious.com

Boaler also offers examples of rich tasks throughout her book and in the appendix. Boaler continues to inspire us as teachers of mathematics. Mathematical Mindsets by Jo Boaler has proven to be my go-to professional text. I continue to reach for it to review my post-its and highlighted sections as a reminder of what math could be. It is important we cultivate young mathematicians that can see their subject as creative, beautiful, and open. Encouraging youngsters to be mini mathematicians can be empowering!

The Association of Mathematics Teachers of New Jersey’s (AMTNJ’s) Teacher Outreach committee is excited to offer nineteen one-day summer workshops throughout the state. There are workshops for all educators from grades 3-12.

The elementary workshops that are offered this summer are “Visualizing Problem Solving Through Proportional and Spatial Reasoning,” “Flipped Classroom in Algebra,” “Wonder-Full and Event-Full Probability in Grades 5 - 10,” “Polyhedra Euler’s Formula and 3-D Constructions,” “Memorable Hands-On Activities for the Middle School Classroom,” and “Statistics and Social Studies (SASS) – Tools to Promote Quantitative Reasoning.”

Along with three of the above-mentioned workshops, middle school and high school educators have additional choices. These workshops are: “Equity in the Mathematics Classroom,” “Visualizing Algebra,” “Developing Mathematical Habits of the Mind – Thinking the Math as Well as Doing the Math,” “Culturally Relevant Leadership – Continuing the Conversation on Pathways to Success in 6 - 12 Math,” “Integrating STEM Lessons in the Math Classroom,” “Teaching Algebra 1, Geometry, Algebra 2, and Trigonometry with Technology,” “Math Task Design with Desmos Activity Builder,” “Creating High School Math Curricula with Career Pathways in Mind,” and “Understanding Quadratics: Analyzing Data, Writing Equations, and Modeling with Technology.”

There is a workshop strictly for instructional coaches, supervisors, and other math leaders, entitled “Tips for Math Coaches, Math Supervisors, and Math Leaders.” The workshops are being offered throughout the state of New Jersey.

This summer teachers will be creating lessons using Desmos, GeoGebra, and YouTube, creating 3-D models, flipping the classroom, creating hands-on materials, connecting abstract concepts to the real world, creating two-dimensional models and engaging in many more pedagogical activities.

A special thanks to our presenters and host schools: Montclair State University; Byram Township School; West Windsor–Plainsboro; Kent Place School; Parsippany–Troy Hill School District; Clifton Public Schools; Rancocas Valley High School; and North Hunterdon High School.

A brief description of our speakers’ biographies and qualifications is located on the AMTNJ website. Workshops run from 8:30 am – 2:00 pm, and while light refreshments are offered, it is recommended that participants bring their lunch.

For more information and descriptions of the sessions, go to www.amtnj.org or send Dianna M. Sopala an email to diannamsopala@yahoo.com.
Math is hard and math is boring. We have all heard those complaints. I don’t apologize that math can be hard. But the boring part is something we as teachers can work on. As an exclusively online teacher, I use three technologies in my classes that try to do something about the boring part, and maybe the hard part too. I’m not sure how common these technologies are, so I would like to share them with you.

First, I use original math cartoons in my classes. I could not find existing cartoons that say exactly what I want, and I was concerned about copyright issues, so I have hired a few artists that draw original cartoons to my specifications. It can be challenging working with artists who are not math folks. I am not above going for a cheap laugh, but there is usually a math point to my cartoons. A picture is worth a thousand words. Here is a cartoon that illustrates why a statistical hypothesis may need to be rejected:

What is the chance this sample comes from the first population?
Maybe they come from the second population.

Second, I use original videos to explain something when I am unhappy with the textbook explanation, and when I think students will never remember a blackboard presentation. Nowadays you can use a cell phone, a tablet, or a computer with a webcam to quickly create a video without the need for additional software. I believe a five-minute video is about the right length before boredom sets in. Here is a link to one of my videos that demonstrates a two-finger approach to matrix multiplication for a visual learner who may find the algebraic description in the textbook confusing:

Finally, I use simulations that I create in Excel to illustrate material differently than the conventional textbook algebraic explanation. I have used simulation to demonstrate finding the area under a curve, the Buffon’s Needle problem, the Monty Hall problem, the Central Limit Theorem, confidence intervals, and other problems. The birthday problem — what is the probability that n random people have the same month and day birthday — has a straight-forward algebraic solution, and is fun to test with a classroom of students. But a single test always leaves me dissatisfied. A better test would be to repeat the experiment with many classes of students, and simulation is an efficient way to repeat this experiment. There are better computer languages for simulation, but Excel works just fine for my purposes. Here is a link to one of my Excel files containing the birthday problem simulation:

None of these technologies — cartoons, videos, and simulations — is terribly complicated. Each of them is my attempt to combat the “math is hard and math is boring” complaint. I encourage you to give one or more of these a try.
2018 Annual Two-Day Conference

Overall Theme:

*Taking Action*

Thursday: *Effective Teaching Practices*
Friday: *Creative Assessments for the Classroom*

**Thursday-Friday, October 25-26, 2018**

The National Conference Center at the Holiday Inn
East Windsor, New Jersey
Save the Date

2018 10th Annual Special Education and Mathematics Conference

Theme:
Addressing the Challenges of Special Needs Students in the Mathematics Classroom

Strands:
Executive Dysfunction
Understanding Anxiety
Learning Disorders

Wednesday, December 5, 2018

The Ramada Plaza
Monroe Township, New Jersey
Association of Mathematics Teachers of New Jersey

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AMTNJ Calendar of Events

July 1 - August 31  Summer Institutes
Holiday Inn, East Windsor, NJ

October 25-26  AMTNJ Annual Two-Day Conference
National Conference Center
Holiday Inn, East Windsor, NJ

December 5  AMTNJ Special Education and
Mathematics Conference
The Ramada Plaza
Monroe Township, NJ

For updated information go to amtnj.org