AMTNJ News

Association of Mathematics Teachers of New Jersey

September 2021 • Volume XLV, Number 3

IN THIS ISSUE

President's Message

As we begin a 3rd year impacted by COVID-19, I am struck by two things: the monumental task facing teachers this year, and the incredible resilience and dedication of teachers in the face of this challenge. Teachers always go above and beyond for their students, but this vocation becomes so much more difficult with the additional challenges inflicted by COVID. Still, teachers are showing up every day to teach, mentor, hear, and care for their students, and deserve our fullest praise and gratitude.

I hope that this newsletter finds you well, and further, that it demonstrates the creativity and commitment of our colleagues, who are still working to improve teaching and learning during the pandemic. Dianna Sopala opens the issue by sharing some of AMTNJ's upcoming professional development, and I would encourage you to consider participating in the Fall Engage Series, and to regularly check in on new offerings at amtnj.org. Joan Vas discusses one of the crown jewels of AMTNJ (the Scholarship Program!), Kathleen Carter shares accolades for three New Jersey PAEMST finalists, and Tom Walsh shares strategies to make math facts more engaging. Coshetty Vargas shares a bit of her own journey around teacher wellness, John Kerrigan shares some insights around publishing for an academic journal (you may consider submitting an article to our journal, the *New Jersey Mathematics Teacher*, as well as this newsletter!), and Linda Scanlan shares some strategies for small group instruction. Finally, Jelena Komitas and Maria Steffero discuss mathematics and science integration, Mick Nuspl offers a challenge regarding AMTNJ history, and Julie Norflus-Good and Nicole Luongo offer some advice for teachers and new teachers.

Thank you to everyone who is involved in education, because the work you do is incredibly important. While the job is never easy, and teachers rarely get the acclaim they deserve, teachers have the opportunity to make a huge difference in so many students' lives. Thank you for doing this work, thank you for persevering despite the challenges, and thank you for continuing to innovate and create.

Mark Russo
AMTNJ President 2021

Teacher Outreach and the Engage Series

Dianna M. Sopala, Teacher Outreach Executive Coordinator, AMTNJ

The Association of Mathematics Teachers of New Jersey (AMTNJ) has five programs under the Teacher Outreach umbrella. The Summer Institutes are full-day workshops that run in the summer at various locations. Full-Day workshops are workshops from 8:30 am to 3:30 pm during the school year. The WebPD sessions are one-hour webinars. Teacher Outreach workshops are two-hour workshops afterschool in-person at a particular school usually from 4 pm – 6 pm. Customized Staff Development sessions are workshops where a district or school requests a speaker to give a workshop on the client's preferred topic. Due to the pandemic, some of the programs have been put on hold.

In place of these programs, AMTNJ is offering the Fall Engage series. Beginning in October, Dianna Sopala will lead an Engage Series - Personalizing Learning. We know that this year, more than ever, teachers will face students with a wide variety of previous learning experiences. Dianna will show us techniques for meeting the needs of all learners, "just in time" intervention instead of "just in case" intervention and how to leverage some of the amazing technology we used this year. In November, Andrea Bean will be leading an Engage Series – Social Emotional Learning. This series will focus on the structures of your class that promote SEL, the instructional choices that promote SEL and how to infuse your curriculum with the skills outlined in the CASEL Framework. In December, Jessica Cincotta, Melissa Pearson and Susan Totaro will host Engage - Equity and Inclusivity. This series of presentations allows participants to progress through three stages of equity work within the context of mathematics education; awareness, shifting your practice, and using data to disrupt disproportionality.

The Personalized Learning Engage Series will be offered to participants on the first three Mondays in October from 7 pm – 8 pm. The dates are October 4, October 11, and October 18. Participants are asked to bring their curriculum guides. Dianna Sopala will share her "just in time" intervention ideas, which have been used even prior to the pandemic and then participants will apply them to their situation. Participants will leave this workshop with the tools to apply the "just in time" intervention techniques. To register for the Personalized Learning Engage Series, please use THIS GOOGLE FORM.

Edcamp AMTNJ is back!

Discussions, sharing, door prices

and so much more!

Mon, Sep 13, 2021, 12:00 AM – Wed, Sep 15, 2021, 2:30 PM EDT

Use this link for more information and FREE registration.

AMTNJ Celebrates 25 Years of the SCHOLARSHIP PROGRAM

Joan J. Vas, Executive Coordinator of
AMTNJ Scholarship Program

Back in 1996, when I was president of AMTNJ, I founded the AMTNJ Scholarship Program. This program was designed to support the efforts of graduating high school seniors who wished to pursue a career in mathematics education. The program still exists and is flourishing. Any member of AMTNJ can nominate High School students who indicate that they have a desire to become mathematic educators and who are about to graduate from high school. The current application is available on the AMTNJ website, www.amtnj.org. A committee evaluates these applications and awardees are announced each May. All awardees are able to apply for renewal of their scholarships for the subsequent three years. The applicants MUST still be majoring in mathematics education and maintain good grades. The amount of monies awarded each year is dependent on available funds.

AMTNJ has a strong history of committing to improving the field of mathematic educators and supports the development of young people in their vocation. Please join us in impacting and preparing our future and donate to the future of NJ math educators. Your contributions to this 501-C3, tax deductible charitable program, The AMTNJ SCHOLARSHIP PROGRAM, can be mailed to: AMTNJ, Scholarship Program, C/O Joan J. Vas, 10 Edgewater Drive, Matawan, NJ 07747 OR visit https://amtnj.org/donations/

Thank you to ALL AMTNJ members for your donations. Below is a complete list of all awardees. With your support, this program will continue for many more years.

COMPLETE LISTING OF AMTNJ SCHOLARSHIP AWARDEES

1997 Zalenda Cyrille, Bret Hanlon, Daniel Rotante	2010 Louella Estillero, Amanda Hamlin
1998 Yoon Ok (Kathy) Lee, Janine Miscia, Ginny (Virginia) Smith	2011 Shannon Gray, Hannah Kretz
1999 Jacob Kosoff, Christopher Updike, Qing Ray Wang	2012 Stavroula Kontogiannis
2000 Russell Moriarty, Christopher Mulligan, Gina Marie Musella	2013 Lindsey Gerding, Kellie Lane, Kayla White
2001 Lauren M. Fazzio, Nancy Jarger, Julie Jeral, Kristen Lunny	2014 Daniel John O'Keefe
2002 Melanie F. Kaplan, Danica Miller, Heather Nellis, Margaret Terabokija	2015 Alissa Fanelli, Nicole J. Steitz
2003 Allyson Johnson, John Kerrigan, Serena Rezny	2016 Ryan Pennnypacker
2004 Amanda Broadwater, Michael McGarry, Megan Power, Colleen Sampson	2017 Ann Brunn
2005 Saijad Abdullateef, Anita Shah, Jenna Walsh	2018 Hunter Romanko, Karen Villagomez
2006 Jessica Jakositz, Christopher Mango, Melissa Maynard, Christina Wilps	2019 Marless Butryn, Samantha Cohn, Caroline Lukhowec, Jacqueline Metz
2007 Samantha L. Briadi, Alissa Gallo	2020 Emily Elias, Anthony Paterno
2008 Sarah A. Loveland, Elena Rongone	2021 Haley Meyerson
2009 Julie Angelini, Amanda Hrehorovich, James Olivola	

NJ PAEMST Finalists Announced

Kathleen Carter, Teacher of Mathematics
2013 PAEMST Awardee
North Hunterdon High School

In April 2021, Evan Levy, Caitlin Murphy, and Anne Paoletti were named the New Jersey Finalists for the Presidential Award for Excellence in Mathematics and Science Teaching (PAEMST) in the area of mathematics. The Presidential Awards recognize outstanding teaching for grades K-12 in science, technology, engineering, mathematics and/or computer science. The 2020-2021 nomination cycle for Presidential Awards was open for teachers grades 7-12, and applications were submitted April 1st. Candidates for the award must demonstrate in-depth knowledge of their content, engaging instructional methods to support student learning, and appropriate assessment strategies. In addition, these finalists exhibit habits of reflective practice and demonstrate leadership in education beyond the classroom.

Evan Levy teaches at Boonton High School in Boonton, NJ. In 2020-2021 he taught Algebra 1, Introduction to College Math and AP Statistics. He has been at Boonton H.S. since 2014 and has also taught Geometry, Geometry Honors, Algebra 2 and Algebra 2 Honors. He strives to help students build connections through collaborative problem-solving. He guides his students with strategies to confront the uncomfortable feeling of tackling new problems; and as he worked with his students during the pandemic, they adapted to the challenges of virtual school together. Evan is a Google Certified Educator and coaches colleagues on how to incorporate technology in using multiple representations. He is also an AVID program leader, a program that develops strategies to support students in the academic middle. In the spring he completed a principal certification program at Montclair State and looks forward to extending his role in supporting student learning as a future administrator. @evan_levy

Caitlin Murphy teaches Algebra 2 and Honors Computer Science at Pascack Valley High School, Hillsdale, NJ, where she has been teaching since 2015. She collaborates with her colleagues to implement standards-based grading in her Algebra 2 classes and is passionate about establishing equitable grading policies. Having learned Java programming on her own, she has been teaching a year-long Honors Computer Science course that culminates in student-driven projects where they develop games. In 2019 Caitlin was named a Desmos Fellow and spent a weekend working with the teaching team at Desmos headquarters in San Francisco, CA, along with 40 other educators. Last winter she led a 3 - part ENGAGE webinar series for AMTNJ on using the Desmos Activity Builder to connect students in remote learning and improve their virtual math lessons. @ms_murphyPVHS

Anne Paoletti teaches Algebra 1 and Mathematics Research & Writing at Clearview Regional High School in Mullica Hill, NJ. She has been at Clearview Regional High School District since 2013 where she has also taught Advanced Math 7 and Advanced Math 8. After several years working in the telecommunications industry, Anne's teaching career started in Massachusetts in 2002 at Watertown Middle School where she also participated in several cycles of Japanese Lesson Study. From 2009 to 2013 she taught Algebra, Geometry and SAT math at Susquehanna Valley High School and Middle School in Conklin, NY. She creates lessons that foster a conversation-rich learning environment in which students are playful with mathematics and experience the range of emotions from frustration to elation. Since 2015 Anne's involvement with the Park City Math Institute (PCMI) has evolved from participant to teacher leader to outreach coordinator. From inspiration through PROMYS for Teachers in Boston and PCMI, Anne developed a math elective, Mathematics Research & Writing, a year-long course developing students as mathematicians where they follow their curiosity and explore mathematical topics. The course was first offered in the 2019-2020 school year and was a huge success. For the 2021-2022 school year, she is thrilled to provide Mathematics Research & Writing to the second cohort of young scholars eager to open their hearts and minds to the world of math. @paomaths

These state finalists were selected by a panel of New Jersey mathematicians, education researchers, district - level personnel and classroom teachers. Each received feedback from the panel and had the opportunity to revise their submitted application before it was forwarded to the national competition in May 2021. There are 3 finalists for mathematics and 3 finalists for science. The National Science Foundation reviews the applications of the state finalists and forwards 2 candidates to the White House Office of Science and Technology Policy. The winners receive a certificate signed by the president, a $10,000 award from NSF, and a paid trip to recognition events and professional development offerings in Washington, DC. Best of luck to Evan, Caitlin and Anne as they await the White House announcement of the New Jersey Presidential Awardee for 2021. For more information about PAEMST or to nominate an outstanding K-6 teacher for 2021-2022, please visit paemst.org.

WHAT ARE YOUR GOALS FOR THIS SCHOOL YEAR?

Anna Panova @harpgirl555 · Aug 31
Replying to @LenaKomitas @amtnj and 2 others
This year I truly want to focus on creating a safe space for students where they can feel that they can be 100% themselves. Part of this goal is also bringing my authentic self into the classroom each day.

Anne Paoletti Bayna @paomaths · Aug 31
Replying to @LenaKomitas @amtnj and @AndreaBean6
I am drafting an article titled, "Mathematics Research & Writing Elective for High Schoolers - How can mathematics empower students to create a life of purpose?"

Nick Corley @MrCorleyMath · Aug 31
Replying to @LenaKomitas @amtnj and 2 others
Excited to mix things up by using the @desmos curriculum with my students. Hope to make them better thinker and observers. Hope to make them feel like they are ALL math people.

Anne Paoletti Bayna @paomaths · Aug 31
In it, I discuss:
-How can we tap into our natural curiosity we enjoyed as children?
-When does structure enable creativity versus stifling it?
-How does precise language help us unveil purpose in our work?
-How do we use math to inspire productive conversations with others?

Andrea Bean @AndreaBean6 · Aug 31
Replying to @LenaKomitas @amtnj and @paomaths
My goal is to make math class a comfortable, welcoming place where EVERY child can learn and grow as a mathematician.

Learning the Basic Facts Can be Fun!

Tom Walsh, Math Education Professor, Kean University, Union, NJ

Learning the basic facts does not have to be boring, but it can be if the only technique is memorizing the tables for addition, subtraction, multiplication, and division. There are many strategies that can be used to learn, and eventually quick recall of the basic facts. The key is variety! The more ways you expose students to the basic facts, the better they will have fun, and remember the facts. Here are a few strategies that will help them remember the basic facts.

ADDITION

1. Use dice to choose the fact to be solved. Alternatively, a set of dominoes could be used to choose the addition fact. For numbers beyond 6, consider a spinner that will go up to 9. Add the two numbers chosen by the dice/domino/spinner. This turns the learning of facts into a fun game; one that students will love to play.

2. When a fact is chosen, turn that fact into four facts: two addition, two subtraction. For instance, for the fact 5 + 6 = 11, turn it around and give 6 + 5 = 11. Then, make it two subtraction facts: 11 – 5 = 6 and 11 – 6 = 5. An added advantage of this is that you can point out two fundamental properties of mathematics: the commutative property of addition (or, some books it is called the turn-around property), and that subtraction is the inverse of addition. These four facts are called Fact Families in many books.

3. Have students draw up a number fact table. Give them this:

+	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Then, have students fill out the chart with all the addition facts. Once in a while, have students bring the chart out and ask them facts and let them look the up. This will help their deep memory.

4. Doubles. Utilizing everyday objects, you can go down the diagonal of the addition table. Double one is two hands. Double two is two hands and two feet. Double three is the insect double (three legs on each side of an insect's body). Double four is the spider double (spiders have four legs on each side of their body). Double five is the hand double: five fingers on each hand). Double six is the egg double (six eggs in each of the two trays of a dozen eggs). The seven double is the calendar double (each of two weeks has seven days). The eight double is the crayon double (some crayon boxes have eight crayons in each of two trays). The nine double is the truck double (large trucks on the highway are 18-wheelers: nine wheels on one side, nine on the other). The ten double is the hands and feet double (ten fingers, ten toes).

5. Near doubles. Once you've gone through the doubles with students, you can suggest one or two more or less. For example: Double 5 plus one; or Double 7 minus 2, etc.

SUBTRACTION

1. As with addition, you can use dice to choose the fact to be solved (one number rolled subtracted by the other number rolled). Alternatively, a set of dominoes could be used to choose the subtraction fact. For numbers beyond 6, consider a spinner that will go up to 20. Subtract the two numbers chosen by the dice/domino/spinner. As with addition, this turns the learning of subtraction facts into a fun game; one that students will love to play.

2. Subtraction as an inverse-addition problem. When considering a subtraction problem, have the students look at it as an addition problem. For example, if the fact is 11 – 6, have students figure what number added to 6 gives 11 (5). This technique avoids the problem students have in counting down while keeping track of the original number. It is, in essence, a much more efficient way of mastering the subtraction facts.

3. As with the addition fact families, you can utilize the companion subtraction fact to the existing one. For example, 8 – 5 = 3. Follow that immediately with 8 – 3 = 5. This links two facts, and gives students a way to remember both facts better.

4. Doubles can help students to understand the role of zero in mathematics. Point out that the subtraction fact of the doubles always equals zero.

5. Difference search. Prepare a worksheet that has about 15 – 20 subtraction facts on it (displayed in a random fashion; not all horizontally displayed). At the top of the worksheet, put the target difference number students should look for, and they are to circle the subtraction fact that equals that difference. Make sure that at least 6 – 8 of the random facts equal that target number.

MULTIPLICATION

1. Use dice to choose the fact to be solved. Alternatively, a set of dominoes could be used to choose the multiplication fact. For numbers beyond 6, consider a spinner that will go up to 9. Multiply the two numbers chosen by the dice/domino/spinner. This turns the learning of facts into a fun game; one that students will love to play.

2. Skip counting to go up the multiplication tables. Have students count 2 – 4 – 6 – 8 etc. or, 6 –12 – 18 – 24 etc. to help remember the multiplication tables.

3. As with addition, have students draw up a number fact table. Give them this:

X	0	1	2	3	4	5	6	7	8	9
0										
1										
2										
3										
4										
5										
6										
7										
8										
9										

Then, have students fill out the chart with all the multiplication facts. Once in a while, have students bring the chart out and ask them facts and let them look the up. This will help their deep memory.

4. Doubles (again). As with addition doubles, utilizing everyday objects, you can go down the diagonal of the multiplication table. Double one (2 x 1) is two hands. Double (2 x 2) two is two hands and two feet. Double three (2 x 3) is the insect double (three legs on each side of an insect's body). Double four (2 x 4) is the spider double (spiders

have four legs on each side of their body). Double five (2 x 5) is the hand double: five fingers on each hand). Double six (2 x 6) is the egg double (six eggs in each of the two trays of a dozen eggs). The seven double (2 x 7) is the calendar double (each of two weeks has seven days). The eight double (2 x 8) is the crayon double (some crayon boxes have eight crayons in each of two trays). The nine double (2 x 9) is the truck double (large trucks on the highway are 18-wheelers: nine wheels on one side, nine on the other). The ten double (2 x 10) is the hands and feet double (ten fingers, ten toes).

5. Two great memory aids to multiplication are the 5 times tables and the 9 times tables. For the 5s, link the table to analog clock arithmetic. So, when the hand is pointing to the 1, the clock is 1 x 5 = 5 minutes past the hour. When the hand is pointing to the 7, the clock is 7 x 5 = 35 minutes past the hour. This gives an added advantage of teaching contemporary students (who are mostly digital minded) analog clock. For the 9 times table, we use a very simple rule: subtract one and add one. 1 x 9 = 9. For 2 x 9, take one away from the ones pace and give it to the tens place: 18. For 3 x 9, take one away form the ones place and give it to the tens place: 27. You can go through the entire 9 times table, up through 10 x 9, and really beyond.

DIVISION

1. As an inverse-multiplication fact. When considering a division problem, have the students look at it as an inverse multiplication problem. For example, if the fact is 36 ÷ 4, have students figure what number multiplied to 4 gives 36 (9). Again, it links one fact to another, and thereby aids in the memorization process.

2. Quotient search: Similar to the Difference Search, prepare a worksheet that has about 15 – 20 division facts on it (displayed in a random fashion; not all horizontally displayed). At the top of the worksheet, put the target quotient number students should look for, and they are to circle the division fact that equal that quotient. Make sure that at least 6 – 8 of the random facts equals that target number.

3. Utilize the multiplication table (above) in reverse to have student remember their division facts. For instance, have students look at a product, and the two factors that produced that product. Ex: 56 ÷ 8 = ? Students can look on the table to discover that 7 is the quotient of 56 ÷ 8.

For all four operations, all board games can be adapted to these facts. For example, with Bingo, we can make up a Bingo card using the multiplication tables 5 – 9:

MULTIPLICATION BINGO

5	6	7	8	9
15	66	35	16	27
45	42	7	48	81
25	36	Free	64	63
50	54	56	32	18
35	48	28	40	54

Make up a dozen or more of these cards (varying the products, of course), and distribute them among the students. Then, make up a deck of flash cards, and give students bingo chips. Hold up a flash card with a multiplication fact on it, and students are to cover the product with their chips. Give a prize of a tootsie roll for the winner. Now, for the purpose of this game, multiplication is not commutative. That is, for the multiplication fact: 6 x 8, students cannot place a chip on the 24 under the 8 column; the chip can only be placed under the column of the first number. You can make up addition, subtraction, and division Bingo games, as well. In fact, all the great board games (Candyland, Chutes and Ladders, Monopoly, Life, etc.) can be made into fact games. The key, as mentioned at the beginning, is VARIETY! The more ways you offer up the four facts, the more interesting, and fun, it will be for the students.

Resources: Elementary & Middle School Mathematics: Teaching Developmentally, by J. Van de Walle

My Reflection on Teacher Wellness

Coshetty Vargas, Teacher of Mathematics 5-12, Washington Park School, NJ

Last year has been very challenging for all of us! After facing one of the most stressful years of my career in the spring and fall of 2020, I felt the need to rethink my priorities in life. While looking for ways to relieve some of my stress, I found out that there are Teacher Wellness courses designed to make you feel good about yourself, to encourage you to take care of yourself, to be positive, and to be happy.:)

After careful consideration I decided to take two teacher wellness courses provided by Learners Edge in the spring of 2021 and two wellness courses in the summer of 2021 for preventing teacher burnout. I have come to realize that despite loving teaching, if we do not properly balance the many pressures of life and our career, it can become very overwhelming. Teacher wellness courses reminded me that as teachers we have the power to influence young minds, and in order to do that in a positive way, we need to maintain our passion to do our job with a purpose. Through these courses, I learned that I am not alone, for many teachers experience challenges that can lead to teacher burnout. In my experience, at times I felt like nothing I did was good enough so it was very hard to feel good about myself, and I even considered changing my career or retiring early due to added demands, including the many challenges of virtual learning.

Due to the high level of stress at work, before taking teacher wellness courses, I have felt at times as if my sanity was at stake and I have struggled while trying to keep up with my wellbeing. It seemed as if I had to choose between having a life or being a good teacher because I refused to settle for being an average or below average teacher. Not only was I able to relate to these courses but most importantly, I was able to feel for the first time in a long time that I can change things for the better. By feeling good about myself, I can also help my colleagues going through similar situations. Most importantly, by improving my wellbeing, I can help my students improve their performance.

Many of us are aware that despite the many challenges we face in our profession, this is where we are meant to be as one of my favorite videos from one of my courses stated: "Teaching is tiring but it is worthy". I think every teacher deserves to feel appreciated as I try to think of the many students that thanked me with their efforts, smiles, accomplishments, or just a note, and it is in that moment that I know teaching can be very rewarding. This is why we should not let the negatives outbid the positives of our profession.

Moving forward, I am committed to practicing self care goals, good sleep, exercise, connecting with other colleagues, separating work from home (as much as possible), eating well, and finding me time. After taking teacher wellness courses, I am definitely looking forward to using more teacher positive mindfulness practices. I have passion for my profession and I need to find ways to deal with stress in a way that does not overcome my love for teaching. I care deeply about making a difference for my students and giving them the best of me.

May we motivate one another and advocate for teacher wellness to prevent or avoid teacher burnout by providing support and creating a positive working atmosphere.

Coshetty Vargas, Teacher of Mathematics 5-12, Washington Park School, NJ
AMTNJ Member/Teacher Outreach/Middle School Contest Co-advisor
Co-advisor of Gifted and Talented
Presidential Award for Excellence in Mathematics and Science Teaching 2014 Recipient
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Tips for Publishing an Academic Journal Article

John Kerrigan, Ed.D., District Director of Evaluation & Assessment Practices
Middletown Township Public Schools

Recently I was fortunate to have my work on productive failure in the flipped mathematics classroom published in the Journal of Mathematical Behavior. This was a year-long process that involved rounds of revisions and follow-up work. In this article, I outline some tips for submitting articles to an academic journal that may be helpful for anyone who gets the itch to publish.

1. Research the appropriate journal for your article
   Be sure the article you are writing is within the scope of the journal you are submitting to. Some journals are specific to K-12, some to higher education, etc. For example, NCTM's Learning and Teaching PK-12 journal requires student work samples as part of their submission. PRIMUS is a journal that takes practitioner articles on issues in undergraduate mathematics education. You might want to also look at the journal's impact factor and acceptance rate to decide if it is right for you.
2. Look at sample articles for structure
   Every journal has a different requirement for what they are looking for in articles. The most common structure includes an introduction, statement of problem/research questions, review of literature, methods, analysis, findings, summary, and conclusion. Some journals don't require a specific layout, so it is best to see what has been previously accepted and published by the journal of interest to see what format they prefer.
3. Revise carefully
   Before making your first submission, have a colleague or two read your article to see if it makes sense to someone not as familiar with the project. Consider using Grammarly or a comparable proofreading tool to fix up minor errors. Be sure to include citations for any statements that need them.
4. Be sensitive to reviewers' feedback
   Reviewers are volunteers who have shown an interest or expertise in the subject/grade band you submitted your article to. Some reviewers are very kind in their feedback and will give you additional citations and ideas for improving your paper. Some reviewers may have a difference of opinion with your theory or methodology and may be more critical of what you have to say. Understand that it is completely OK to have widely different reviews. The journal editor will review all reviewers' feedback and come up with a decision that usually involves some level of revision.
5. Create a detailed letter response for reviewers
   Once you get feedback from the reviewers and editor, it is customary to write a letter thanking them for their time, and explain how you have addressed each and every suggestion the reviewers have made. Consider labeling each comment in a systematic way, such as R1-1 (Review #1, Comment #1). Then, explain the specific action you took on the comment, which could include deleting that line, adding in a citation, rephrasing, explicating, etc. Conclude the letter by stating that you hope the edits made have successfully addressed all of their concerns to minimize the number of revisions that might come back.
6. Get published and share!
   Share what you have found with the broader educational community. Common strategies include tweeting, advertising on LinkedIn, including a footer on your email signature with a citation for the article, pushing it out in a newsletter, etc.

Happy Writing!

Small Group Instruction During Group Tasks

Not just for striving learners

Linda Scanlan, Math Coach, West Windsor-Plainsboro Regional School District

While students are engaged in group tasks, the teacher can utilize this time for differentiated instruction. A group task is an engaging activity that can be approached using different strategies and either differentiated for each cooperative learning group or a low-floor/high ceiling task. As an instructional coach who has the opportunity to visit classes in a non-evaluative way and partner with teachers, when we have a clear objective for the teacher's role during this time, they can amplify instruction as they meet the needs of all learners. Purposeful group visitation can include data collection, feedback and observations, but those are only part of the answer. While students are engaged in open-ended tasks working collaboratively, this can be the teacher's opportunity to meet with small groups. Many teachers might view small group instruction as a "struggling learners group" and it is important to meet with striving learners, but all students deserve time with the teacher in a small group setting. By meeting with every student on a regular basis, teachers are making a positive connection, valuing all students and meeting social-emotional needs of students. Small group instruction with a striving learners group can include reteaching, visual models, or alternate strategies to pinpoint learning skills and concepts. In addition, small group instruction can be effective to teach students new ideas (preteaching), instruct based on formative assessment and specific learning needs and differentiate material to meet all students needs. I have worked with teachers to implement three other types of successful groups.

Turn-Key Groups - Create an expert group to teach a small group

Imagine spending time teaching rules to play a game to a whole class, instructions on how to complete an activity or a skill that can be modeled. How engaged are students? How many times are you asked to repeat what you said? Now imagine empowering students with this knowledge to then turn-key the information to a group of students. While students are working on today's group-worthy task, pull a student from each group to meet with. Teach this small group a preview of a game, an activity, or a skill you will do in the future. They will then be the teachers, the experts, and the group leaders when the game, activity or skill happens in your class. Students take ownership of their learning, feel the importance of their responsibility and explain to other students in a way that their peers can then learn from. Rotate turn-key groups throughout the year so that everyone has a chance to be an expert because all students have the capacity to be an expert in some area of learning.

Formative Assessment Groups - Analyze formative assessment to group students with like needs

Good teaching practice tells us to gather information often by formative assessment. What do we do with the data collected? By analyzing formative assessment we can find students with similar needs. Each time we collect data from formative assessment, these groups may or may not change, as groups can be fluid as skills and concepts change.

Groups can be made of students who:

- Made similar errors
- Have similar misconceptions
- Can be enriched to learn deeper
- Need a check-in (validation)
- Need a confidence boost
- Were absent and need a make-up lesson

John Hattie's research shows us that feedback is one of the top ten influences on student achievement. Giving students ongoing feedback in small groups with similar needs provides teachers with a time and place to give targeted feedback informed by students' needs and therefore achievement.

Two Group Model - Two groups, two teachers, two activities

The two group model can be beneficial for classes with more than one teacher, a teacher and support teacher, or a teacher and an instructional coach. One teacher/coach can guide students through a lesson or activity that all students are ready to learn, first with group #1 and then with group #2. The other teacher/coach can complete two similar, but differentiated in level lessons or activities simultaneously first with group #2 and then with group #1. This model allows teachers to differentiate without students feeling like they are in the "high" or "low" group.

Ideally, small group instruction should include all learners approximately once a week. All students deserve time with the teacher to receive guidance while learning, internalize questions, validate their thinking, practice, and be heard in a calm personalized environment. Students will receive specific and personalized feedback making them feel confident, included and safe because all students meet with the teacher for small group instruction as part of the classroom routine. I urge teachers to use small group instruction to maximize teacher effectiveness, promote equity and inclusivity, move students forward in their learning continuum and help students get the feedback they need while showing measurable results in student achievement.

Integrating Science into the High School Math Classroom

Jelena Komitas, Math and Science Supervisor, Manalapan High School &

Dr. Maria Steffero, Math and Science Supervisor, Colts Neck High School

"Mathematics is the gate and the key to the sciences." - Roger Bacon

Welcome to a high school algebra class with the lesson goals to represent data on two quantitative variables with a scatter plot, describe how the variables are related, fit a function to the data (including with the use of technology) and use that function to solve problems in the context of the data (S-ID.B.6a*). Meet Ms. Noether, our Algebra 1 teacher!

The beginning of the class is a great time to set the stage for the lesson and engage students by stimulating their curiosity. Ms. Noether starts the lesson with a few prompts: What do you know about climate change? How do you know it? After some spirited conversation and questions regarding what the students know and wonder about climate change, the teacher tells the students that they are going to be looking at a data set from the National Oceanic and Atmospheric Administration (NOAA) that shows global land and ocean temperature anomalies over the past 140 years (1880 - 2020). The teacher explains that the "temperature anomaly" is the difference between the year's temperature and the long-term average temperature, in this case from 1901 to 2000, which is 13.9 degrees Celsius. The teacher facilitates a brief discussion why in climate change studies, temperature anomalies are more important than absolute temperature and asks students to use available technology tools to represent data of two quantitative variables on a scatter plot: time in years versus temperature anomaly in degrees Celsius.

Ms. Noether facilitates students' development of a model for the data. Would the data suggest a linear or non-linear model? What would the average rate of change mean in the context of this data? Is the function positive or negative? On which intervals? What does positive/negative function values mean in this context? How would we develop a model and determine if it's a "good fit"? She challenges the student groups to fit a function to the data, determine an appropriate domain and range and make predictions. Ms. Noether knows that working with real data can be messy and there is a lot to consider. She takes this opportunity to facilitate a discussion on assumptions students made in the process and limitations of their model. An example of data representation in DESMOS for time (years) versus temperature anomaly (degrees Celsius) is shown in Figure 1.

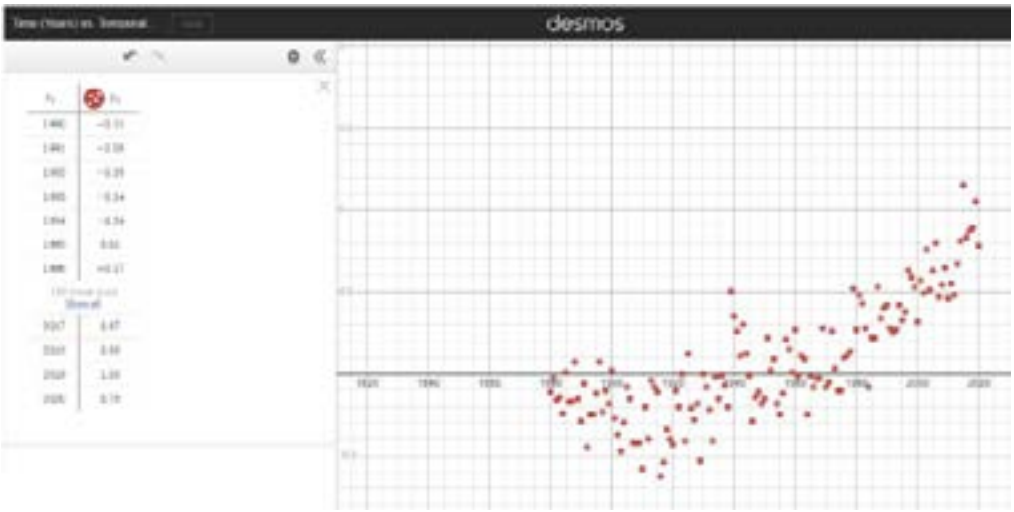

Figure 1. Representation of Time (years) vs. Temperature Anomaly (degrees Celsius)
Source Data: https://www.ncdc.noaa.gov/cag/global/time-series/globe/land_ocean/1/12/1880-2021
Reference activity: https://www.jpl.nasa.gov/edu/teach/activity/graphing-global-temperature-trends/

In this lesson the math and science work seamlessly with each other. Students analyze and interpret meaningful data, make sense of problems, reason abstractly and quantitatively, ask questions, engage in argument from evidence, and model with mathematics. In addition to math content standard S-ID.B.6a* and math practices SMP 1,2, 3, & 4, this lesson integrates science content standard HS-ESS3-5 "Analyze geoscience data and the results from global climate models to make an evidence-based forecast of the current rate of global or regional climate change and associated future impacts to Earth's systems" and science & engineering practices SEP1 (Asking Questions), SEP4 (Analyzing & Interpreting Data), and SEP7 (Engaging in Argument from Evidence). Note that all math content standards referenced in this paper can be found in the Common Core State Standards for Mathematics (2010) and the Next Generation Science Standards (2013).

WHY INTEGRATE MATHEMATICS AND SCIENCE?

When we examine the purpose and best practices for both mathematics and science education, we see that the two fields are inextricably linked. Mathematics teachers use the Standards for Mathematical Practices (SMP) from the Common Core State Standards (CCSS-M), but many of us are probably not as familiar with the Standards for Science and Engineering Practices (SEP) from A Framework for K-12 Science Education (National Research Council, 2012). Figure 2 lists both sets of practice standards and their alignment as organized by Mayes and Koballa (2012).

Alignment between mathematical practices and scientific and engineering practices
(Mayes & Koballa, 2012)

Standards for Math Practices (SMP)	Science and Engineering Practices (SEP)
1. Make sense of problems & persevere in solving them	**1.** Asking questions (for science) and defining problems (for engineering) **3.** Planning and carrying out investigations
2. Reason abstractly & quantitatively	**2.** Developing and using models **3.** Planning and carrying out investigations **5.** Using mathematics and computational thinking
3. Construct viable arguments & critique the reasoning of others	**5.** Using mathematics and computational thinking **6.** Constructing explanations (for science) and designing solutions (for engineering) **7.** Engaging in argument from evidence **8.** Obtaining, evaluating, and communicating information
4. Model with mathematics	**2.** Developing and using models **3.** Planning and carrying out investigations
5. Use appropriate tools strategically	**2.** Developing and using models **3.** Planning and carrying out investigations **4.** Analyzing and interpreting data
6. Attend to precision	**3.** Planning and carrying out investigations **8.** Obtaining, evaluating, and communicating information
7. Look for & make use of structure	**4.** Analyzing and interpreting data **6.** Constructing explanations (for science) and designing solutions (for engineering) **7.** Engaging in argument from evidence
8. Look for & express regularity in repeated reasoning	**5.** Using mathematics and computational thinking **6.** Constructing explanations (for science) and designing solutions (for engineering)

Figure 2. Alignment between SMP and SEP (Mayes & Koballa, 2012)

Both math and science disciplines emphasize sense-making, investigation & exploration, revision of previous solutions, justification, generalization, collaboration and communication. Drake & Reid (2018) offer that integrated curriculum can resolve some challenges we face as educators in developing 21st century capabilities in our students. Through examination and comparison of both sets of practices, Mayes and Koballa (2012) recommend science teachers reinforce the mathematics needed for their courses. Similarly, we as math teachers need to strengthen our understanding of science contexts. Situated as we are in a digital age and inundated with data, Catalyzing Change in High School Mathematics (NCTM, 2018) sets forth a vision of high school mathematics that "empowers students to

expand professional opportunity, understand and critique the world, and experience wonder, joy, and beauty" (p. 9). We need to embed mathematics in context to make these important goals a reality. Further, we need to help students experience mathematics as impactful on a larger societal scale. Using results from student and teacher interviews, Brelias (2015) argues that mathematics should be a tool of social inquiry:

> Activities should engage them in reflection about the benefits and limitations of mathematics to address societal problems and on the impact of mathematics applications on our lives. Engaging them in more activities where they experience the use of mathematics as an instrument of social change is another way to better prepare students for informed and active citizenship (p. 10).

Content from high school science courses (biology, chemistry, physics, environmental science, etc.) provides the context for students to use mathematics as an "instrument of social change," understand and critique their world, and become better informed citizens.

HOW DO WE INTEGRATE SCIENCE IN THE MATHEMATICS CLASSROOM?

"Science integration" can range from a formally written integrated curriculum to using science examples, data, and readings that illustrate mathematical concepts as they occur in the math curriculum. Mustafa (2011) suggests three ways in which we can go about integrating curriculum: interdisciplinary, problem-based, and theme-based. Here, we provide examples of a problem-based approach to integration. Mathematics, life sciences, and physical sciences are unique in what and how certain topics can be taught. We do not minimize the distinction between the disciplines, but rather, we aim to highlight opportunities for us to use rich and meaningful contexts that bring relevance to our math classes.

EXAMPLES OF SCIENCE INTEGRATION IN HIGH SCHOOL MATHEMATICS:

In high school math classes, students are expected to analyze graphs in context. The example we provided at the beginning of the article illustrates integration of practices and content standards. Below are some additional examples from algebra and geometry that integrate contexts from biology, chemistry and physics. Recall that modeling with mathematics is a Standard for Mathematical Practice. Specific modeling standards appear throughout the high school content standards as denoted by a star symbol (*) and should be understood that they should be done in context.

Algebra Using Chemistry Context:

First we have an algebra class with lesson goals that incorporate interpreting key features of graphs (F.IF.B.4*), relating the domain of a function to its graph in context (F.IF.B.5*), and calculating and interpreting the average rate of change of a function (F.IF.B.6*).

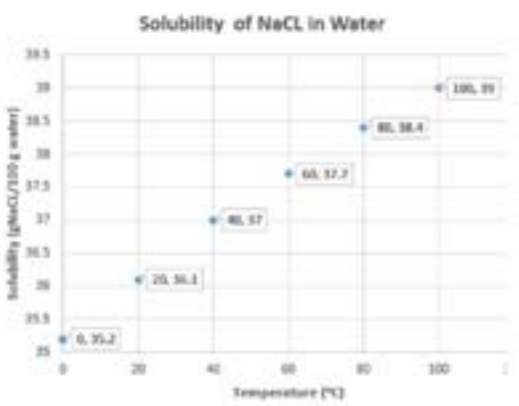

Figure 3. Solubility of NaCl in 100 g of water vs. Temperature. Source: LINK

Figure 3 represents the maximum amount of table salt (sodium chloride) you can dissolve in 100 g of water at different temperatures. Use the graph to answer the following questions.

- Explain why the maximum amount of table salt you can dissolve in water, f(t), is a function of temperature, t. Does it make sense to connect the data points?
- Identify dependent and independent variables.
- Is the function increasing, decreasing or constant? What does it mean in this context?
- Identify x- and y- intercepts (if applicable) and interpret them in

the given context.

- Mia mixed 35.1 g of salt with 100 g of water at 20.0° C. Will all salt dissolve or she will see some salt on the bottom of the jar? Explain your answer.
- Mia added another 2.7 grams of salt and was surprised to see that it just fell to the bottom of the solution. Why?
- By how much does she need to increase the temperature of the water to make sure all salt is dissolved?
- Calculate and interpret in context the rate of change between the following temperatures:
  t=20 and t=40
  t=40 and t=60
  t=60 and t=80
- Find the equation of the line of best fit, f(t), that represents the given data.
- Will f(120) make sense in the given context? Explain.

Algebra Using a Physics Context:

For comparison, we have another algebra class with lesson goals that incorporate interpreting key features of graphs (F.IF.B.4*), relating the domain of a function to its graph in context (F.IF.B.5*), and calculating and interpreting the average rate of change of a function (F.IF.B.6*). In physics, students use graphs to present objects in motion. The three most common types of motion graphs are position vs. time graphs, velocity vs. time graphs and acceleration vs. time graphs. A strong foundation in analyzing position-time graphs will help students to better understand the other motion graph and lay a foundation for one of the most important calculus concepts. Below is the example of how a position vs. time graph can be used in an algebra class:

Every morning Tom walks along a straight road from his home to a bus stop, a distance of 160 meters. Figure 4 represents his journey on one particular day, where t represents time in seconds and d is the distance (position) from home in meters. (Adapted from: https://www.montgomery.k12.nc.us/cms/lib/NC01000976/Centricity/Domain/634/Interpreting_Distance_Time_Graphs.pdf)

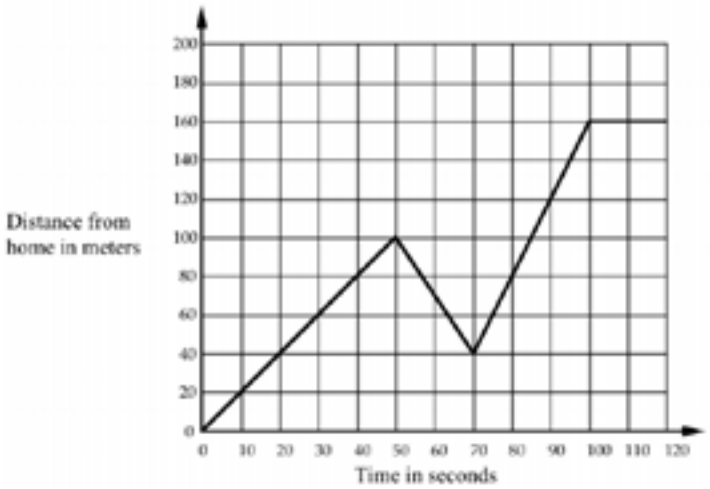

Figure 4. Tom's Distance from home (meters) vs. Time (seconds)

Use the graph to answer the following questions.

- If Tom left home at exactly 6:45am what time did he arrive at the bus stop?
- Calculate the average rate of change between t=0 and t=50. What does it represent in the given context? Calculate the average rate of change between t=50 and t=70 sec. What does it represent in the given content? Are all sections of the graph realistic? Fully explain your answer.
- Identify the domain and range of the function. Identify the intervals where the function is increasing/decreasing.

Extension:

Interval, *t*	t=0 to t=50	t=50 to t=70	t=70 to t=100	t=100 to t=120
Average rate of change, *v(t)*				

- Calculate the average rate of change (position versus time), v(t), on each interval.

- Graph velocity, v(t), versus time, t.
- Calculate the average rate of change between t=0 to t=50 using v(t) versus t graph. What does it represent in the given context?

Algebra Using a Biology Context:

Next, we have an algebra class with lesson goals that incorporate comparing properties of two functions each represented in a different way (algebraically, graphically, numerically in tables, or by verbal descriptions (F.IF.C.9*). Often in a science class students have to analyze and synthesize using more than one representation of data to investigate their hypothesis. Below is an example of how this can be used in a math classroom.

Since bees are critical pollinators, the declining bee population is a threat to the world's food supply. Consider the information provided concerning bee colonies in New Jersey, North Dakota, and the United States. Use Figures 5, 6 and 7 to answer the following questions:

- Describe the general trend of the data in the US. Compare it to the data trend in North Dakota and New Jersey.
- What are the maximum and minimum values of bee colonies in the US? North Dakota? New Jersey? When did it occur?
- For New Jersey, North Dakota, and the United States, calculate and compare the average rate of change in bee colony count between 2000 and 2017.
- When did the bee population experience the largest decline in count in the US, New Jersey, and North Dakota?
- What was the colony count in North Dakota in 2017? What percentage of the bee colonies in the US was it?
- Compare the percent increase/decrease in bee colonies between 2010 and 2017 in the US, North Dakota and New Jersey.
- Identify the mathematical function family that best fits the entire dataset, and write an equation to represent the data that fits within that function family.
- Why do you think the bee population is declining in the US? What can be done to prevent this from happening?

Extension: Learn more about "Pollinators at a Crossroads" by reading https://www.usda.gov/media/blog/2020/06/24/pollinators-crossroads

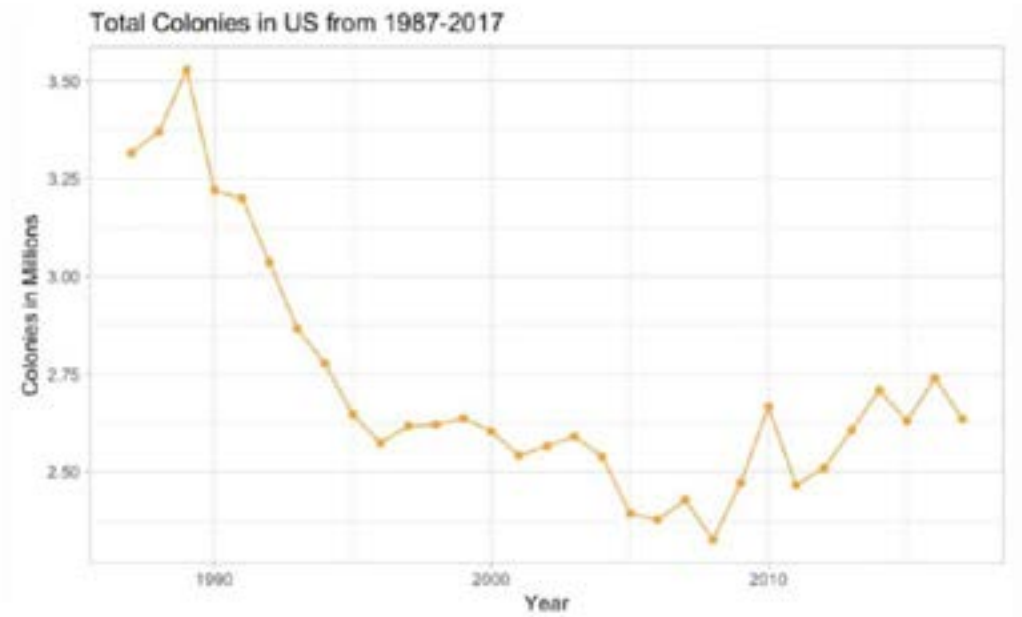

Figure 5. Total US Bee Colonies (millions) vs. Time (years)

Figure 6. Total NJ Bee Colonies (thousands) vs. Time (years)

North Dakota Colony Count 1987 - 2017

YEAR	TOTAL COLONIES	YEAR	TOTAL COLONIES
1987	300,000	2003	340,000
1988	250,000	2004	390,000
1989	310,000	2005	370,000
1990	220,000	2006	350,000
1991	215,000	2007	420,000
1992	340,000	2008	400,000
1993	220,000	2009	450,000
1994	235,000	2010	510,000
1995	220,000	2011	460,000
1996	230,000	2012	480,000
1997	245,000	2013	480,000
1998	230,000	2014	490,000
1999	255,000	2015	490,000
2000	300,000	2016	485,000
2001	280,000	2017	455,000
2002	320,000		

Figure 7. Total North Dakota Bee Colonies vs. Time (years). Data source: https://data.world/finley/bee-colony-statistical-data-from-1987-2017

Geometry Using a Biology Context:

Finally, we have a geometry class with lesson goals that incorporate using measures and properties of geometric shapes to describe real-world objects (G-MG.A.1*) and applying concepts of density based on area and volume in modeling situations (G-MG.A.2*).

To begin, have students guess how many cells are in their bodies. Discuss ways in which they estimated their values and what questions they would ask to get more information for a better estimate. Provide students with the estimate of the average human cell is 100 μm (100 microns) in diameter, which is 0.1 millimeters. Discuss approaches like estimating the volume of a person and dividing by the volume of a cell and explore various misconceptions and the importance of precision.

- If we assume that a cell is a sphere with a diameter of 0.1 mm and that the density of a cell is approximately the density of water which is 1 g/cm, then what could you conclude?
- How could we improve our estimate? (e.g. What assumptions did we make? How do cell sizes vary?)
- Why is cell size important in regards to how cells and tissues grow? Why would estimating the number of cells in our body be helpful?

Discuss extensions with measurements used like a complete blood count (CBC) and the information it gives for the kinds and number of cells in the blood, especially red blood cells and white blood cells.
Task adapted from: http://tasks.illustrativemathematics.org/content-standards/HSG/MG/A/2/tasks/1146

CONCLUSION

Both mathematics and science standards and practices encourage students to make sense of problems, model with mathematics, analyze data, and critique reasoning. Highlighting the many benefits of integration to students' learning experiences, Furner and Kumar (2007) offer an optimistic outlook for problem-based integrations of math and science. In a problem-based approach to integration, it is necessary that students understand the context in which problems are presented. Frykholm & Glasson (2005) suggest a collaborative model in which math and science teachers build connections and pedagogical context knowledge where opportunities to enrich each others' courses

arise. They do acknowledge the challenges that pre-service programs and school districts face for implementation; they reference at the outset that calls for math and science integration and worries about fragmented approaches date back more than 100 years! Today, science data sources are at our fingertips and examples of graphs and tables from various sciences are readily available to educators through online search. We encourage a collaborative approach with our teaching colleagues and our administrators to engage high school students with problem-solving in relevant, impactful contexts. Going down the hall to our science colleagues to share problems can be our first step but our continued reflection on and refinement of curricular resources will be where mathematics truly comes alive!

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"Let it Go..."

Dr. Julie Norflus-Good, AMTNJ Special Education Liaison

For the second year in a row, the schools are opening with so much uncertainty and with so much confusion. Everyone is so thinly stretched as many are struggling with pandemic anxiety, illness, scaredness and confusion. Amongst complex schedules, familial issues, work responsibilities and the ongoing stress, and uncertainty of the Coronavirus Pandemic, the reality is that, once again, this year will be a very different, challenging, and difficult year. Without a doubt, all of us are going to be pulled emotionally in so many different directions due to educational, personal, and societal issues. However, it is so important to realize that due to this emotional exhaustion, it doesn't mean that heading back to school has to feel like a lost cause. We need to remember the most popular lyrics from a favorite Disney Movie, Frozen. We need to give ourselves the permission to just "Let it go." Yes, many of us did not sign up for working with children at an arms length away. We did not think that we would be teaching and communicating through a mask. We did not think that we would not be able to have fun informal snack/lunch time with others. We did not think that we would not be able to sit our students in creative pods. We did not think that we had to limit our supplies and materials. We did not think that we would startle each time someone coughed. We did not think that we would not be able to sing together. We did not think that we would need to sit in alternating seats. We also most certainly did not think that we would still be dealing with COVID-19, and the associated variants.

It is important to be concerned about yourself, be compassionate with yourself. Remind yourself, "I am doing and being the best I can and I just need to 'Let it go.'"

Go day by day. Do not worry about the future. In addition, do not look back! Take it day by day and step by step. No need to leap, skip or jump. Baby steps are fine and just "Let it go."

Take a deep breath!! Look at what you have. Count all of the positives, every little one, and just "Let it Go."

Don't sweat the small and/or the big stuff, and just "Let it Go."

No one is perfect, we all have flaws, and just "Let it Go."

Remember to look for little milestones and set small attainable goals. Find something to look forward to, or to laugh about. Treat yourself and indulge in a new Amazon purchase, a small ice cream cone of your favorite decadent flavor, or some M&M's. Be kind and patient to yourself. Remember that we are all in it together, and that this is not a race, we are there with each other. As you are taking your deep breath, just know you are not alone and "Let it Go."

Help us find a photo of Mrs. May J. Kelly, AMTNJ President #41, 1954-1955

J. Michael Nuspl

AMTNJ was organized on May 23, 1914 and is now in its 107th year of continuous operation dedicated to promoting the teaching and learning of mathematics at all grade levels throughout New Jersey. Our archives committee has found AND VERIFIED 106 of the 107 photos of AMTNJ Presidents. We are only missing a photo of Mrs. May J. Kelly, AMTNJ President #41, 1954-1955. Mrs. Kelly was a long time elementary school teacher at Brighton Avenue School in Atlantic City, NJ. She not only taught mathematics but was the advisor of award winning student publications at Brighton Avenue School.

Brighton Avenue School

May J. Kelly, nee Reddy, was born in Massachusetts in 1902 and died in May 1982. She was married on Valentine's Day in 1924 to William E. Kelly in Manhattan in New York City. Later on they had a son, William, who is now deceased along with his father. We have not been able to locate any living relatives at this time. According to the 1930 and 1940 Federal census, the Kelly family lived in Margate City, New Jersey. Household members' names and their ages were listed on the census reports including her mother and sister in the 1930 census. At one time Brighton Avenue School was going to be razed to make way for a new facility and all artifacts including photos, scrapbooks, etc. were moved to a district storage facility. Unfortunately, Hurricane SANDY paid a visit to the Atlantic City area and damaged any hope of finding a usable photo. The school building has been renovated since then and is currently used as a lower grades elementary school building.

Our committee has found many pages of articles in text format BUT NO PHOTO of Mrs. Kelly. We have a photo of her house along the beach in Margate City but Mrs. Kelly might have been inside when the photo was snapped in the 1930's. If you have any leads or suggestions for our committee to pursue, contact our current AMTNJ Historian, Dr. J. Michael Nuspl at nusplmath@gmail.com.

New Teachers' Corner

AMTNJ traditionally offers advice and encouragement to new teachers. This month's "Tip for New Teachers" comes from Nicole Luongo, Ed.D., former first grade teacher and now a Professor of Education at Saint Peter's University:

As you start your teaching career, I am sure you are excited! You will be in a classroom with energetic students and working alongside admired colleagues. However, it is easy to get overwhelmed with so many ideas, lesson plans, and (of course) new technology! My advice is to take it one day (or lesson) at a time. Start small. Try new techniques, but hold onto the ones that worked yesterday. Also, ask your students what worked and what did not work. And always remember-- tomorrow is a fresh start. Good luck!

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THANK YOU to the authors who shared their knowledge and experience to make this newsletter possible.