President's Message

Welcome to the annual MTA Conference at Charles P. Allen High School! It's a pleasure to learn and collaborate with mathematics teachers from across the province.

A special thank you to today's presenters. Your willingness to share your expertise is what makes this event so valuable.

I'd also like to express my gratitude to the MTA executive team for their hard work in making this conference a success. If you'd like to meet these dedicated volunteers and learn more about our professional association, please join us at the AGM in the library at 12:30.

Finally, I want to thank our keynote speakers, Dr. Jennifer Bay-Williams and John Irving. We are fortunate to have them with us today, and I look forward to their insights.

Erick Lee
President, Mathematics Teachers Association

Message du président

Bienvenue à la conférence annuelle de l'AMT au lycée Charles P. Allen ! C'est un plaisir d'apprendre et de collaborer avec des enseignants de mathématiques de toute la province.

Un grand merci aux présentateurs d'aujourd'hui. Votre volonté de partager votre expertise est ce qui rend cet événement si précieux.

Je tiens également à exprimer ma gratitude à l'équipe exécutive de l'AMT pour leur travail acharné, qui a permis de faire de cette conférence un succès. Si vous souhaitez rencontrer ces bénévoles dévoués et en savoir plus sur notre association professionnelle, rejoignez-nous à l'AGA à la bibliothèque à 12h30.

Enfin, je tiens à remercier nos conférenciers principaux, Dr Jennifer Bay-Williams et John Irving. Nous avons la chance de les avoir avec nous aujourd'hui, et j'attends avec impatience leurs précieux enseignements.

Erick Lee,
Président, Mathematics Teachers Association

In This Issue
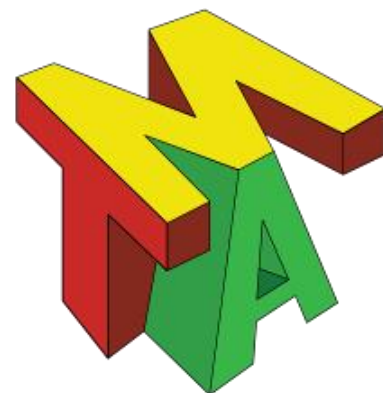
Mathematics News

MTA Sticker Design — Do you have a group of artistic students at your school? Are you at a high school with a Design 11 or Exploring Tech 10 course? If so, consider offering them the challenge of designing a sticker for the next Math Teachers Association Conference. During the past several years, we have printed a sticker for each of the participants of our annual math conference. We are looking for creative designs that incorporate the "Nova Scotia MTA" name with a math focus for the sticker. Students/Teachers can submit sticker designs by emailing mtaconference@nstu.ca and/or courishjl@gnspes.ca. Submissions should be in jpg, png or pdf file format.

Sticker designed by the CEC Exploring Tech 10 class for the 2023 MTA Conference.

The Young Mathematical Story Authors (YMSA) competition — The Young Mathematical Story Authors (YMSA) competition is the world's first annual international competition set up to encourage young mathematics learners (4-16 years old) from around the world to embed their mathematics learning in a meaningful and engaging context through creating their own mathematical story picture books. This competition is organised by MathsThroughStories.org, and it has been running every year since 2019. Since then, the competition has received entries from almost 4,000 students across over 260 schools in 23 countries.

Key Dates: Entries open - Monday 6th January 2025 and close on Friday 21st March 2025. Results are announced on Friday 30th May 2025

If you are interested to learn more about the competition, you can find more details here: https://www.mathsthroughstories.org/competitions.html

Announcements

Félicitations pour votre retraite - C'est avec une profonde gratitude que nous rendons hommage à Cyril Camus, ancien conseiller pédagogique en mathématiques et sciences au CSAP, qui a pris sa retraite en août 2023 après de nombreuses années d'engagement et de dévouement au sein de maintes communautés, particulièrement celles des sciences et des mathématiques. Son parcours remarquable en tant qu'enseignant, directeur d'école et conseiller a laissé une empreinte permanente dans notre communauté éducative. Grâce à sa passion pour l'apprentissage et son soutien inconditionnel, il a inspiré de nombreux enseignants et élèves, contribuant ainsi à améliorer l'enseignement et l'apprentissage. Nous tenons à le remercier sincèrement pour son professionnalisme, son écoute et sa bienveillance. Cyril se distingue par son dévouement exemplaire envers le bénévolat, consacrant son temps et son énergie avec une générosité sans limite. Nous lui souhaitons une retraite épanouissante, pleine de nouveaux défis et de moments joyeux.

Cultivating a Mathematically Rich Learning Space

By Deanna McLennan ([@McLennan1977](#)), Ontario educator and author of Joyful Math. Winner of the 2020 Prime Minister Award for Teaching Excellence in STEM. This article is reprinted with permission from [https://mrsmclennan.blogspot.com/2024/08/cultivating-mathematically-rich.html](#)

It's almost Labour Day! This time of year always fills me with hope. Although it's sometimes sad to be leaving the fun and comforts of summer - spending time with my children, sleeping in, enjoying the back yard with my pup - it's exciting to think of the possibilities of another school year. Like a blank canvas waiting to be painted our classroom evolves and changes over time as the children and I learn and explore together.

As we head back into the school year many educators are working thoughtfully to create environments that are rich with math possibility. In Reggio Emilia the environment exists as the 'third teacher' inspiring, supporting, and extending children's learning in rich and complex ways. I have been contacted by many educators asking for advice on how to best set up their classroom and routines in order to create as many opportunities for authentic math as possible. This has inspired today's blog post - how to cultivate a math rich learning space for children at the beginning of another school year.

I thought it would be easiest to create this as a 'math check list' with points to read and consider. When I reflect upon my own math pedagogy and practice, these are what I think stand out as mathematically meaningful for the educators, children and families that share our space. Although this check list isn't all inclusive, I thought it might spark some ideas to support and inspire as we enjoy the final weeks of summer and return soon to our classrooms with open eyes, minds and hearts.

1. Make math a part of every space in the classroom and child's school world. In the classroom are there math tools and materials available for use beyond a 'math center or math shelf'? Do children see how math relates to every subject in the space (e.g., how materials are sorted and stored on the toy shelf, how measurement is used when children decide on a size of paper to use for their project)? Can they translate math tools and ideas into other spaces in their immediate school world (e.g., see how math relates to their walks in the hallway or work in the gym)?

2. Ground and build math concepts into known objects for children. When introducing, extending or innovating a math idea is it organic and natural to the child's explorations and world? For example, it is more natural to engage children in an exploration of measurement if they measure things in their immediate world using the stick they are playing with, instead of using a standardized ruler (e.g., "Can you find something the same length as your stick in the yard?", "What is taller than your body?").

3. Use available math moments with children. In our classroom we have a large block of uninterrupted play each day. It's sometimes challenging to manage children, materials and activities during center time. However I try to engage with children as much as possible in the activities, and take on the role of 'play partner' together with them. When I am actively playing I am able to closely observe what they are saying and doing, helping me to identify and extend the rich math learning that is organically occurring (e.g., helping children to recognize why their tower keeps falling, using math terms when they equally share the play dough, introducing math ideas as they discuss how many cars are in their parking lot).

4. Become a math role-model for children, families, and colleagues. Even if math isn't your favourite subject, how

Cultivating a Mathematically Rich Learning Space

do you discuss it within your school and classroom? Are you excited by new activities and resources? Do you demonstrate a growth mindset? When mathematical situations arise with children that you aren't sure of, can you use these opportunities to showcase positive thinking and problem-solving? Share your new math learning with others - suggest articles and books you're reading and post these throughout your classroom to enhance documentation displays.

5. Find the math in everything. Many educators plan forward by choosing curriculum and programming expectations and then building activities to fulfill these. Try back-mapping activities from time to time; embrace child-centered, organic experiences and then deconstruct them in order to identify the rich math concepts and curriculum expectations that they utilize. You'll be surprised to find that math happens in almost every experience children have in the classroom.

6. Try looking at life through a mathematical lens. When planning invitations for learning in your classroom see what math you can sneak in as well. Changing one or two elements of the experience might be enough to engage children in rich math. It reminds me of how I used to sneak veggies into my children's meals - a little can go a long way!

7. Collaborate mathematically with colleagues. Share new ideas and resources informally. It's easy and effective to create math invitations and activities and share these within your school or division. If every educator plans one or two activities and these are shared, children will benefit from many rich and interesting games and activities without the burden of planning and preparation it would take one educator to accomplish the same.

8. Record and celebrate your math moments. Help children, families, and colleagues recognize that math happens everywhere in the classroom by creating a documen-

tation display with photos, anecdotal observations and connections to curriculum. This bulletin board can be built over the course of the school year as artifacts of learning are continually added by staff and students. Keep sticky notes nearby and invite observers to record their own ideas and share them by posting the notes within the documentation.

9. Engage families in joyful math with children outside of school. Consider ways that you can promote and extend math for children after school. Encouraging families to play math games and activities together with their children will not only provide children with additional meaningful math moments, but it may help older family members reconcile their fear or dislike of math.

10. Build your collection of math stories, songs and games. Children love to sing, dance and play games. Ask colleagues to share their favourite games and activities, and use these to help with transitions and other 'math moments' throughout the day. Quite often the words in songs can easily be improvised to match something happening in your classroom, and many rich storybooks have mathematical elements and problems embedded within them that can inspire children.

These are just a few of the ways in which I cultivate a rich math space with children. I'd love to hear from you! Share your math ideas and consider following my Instagram @McLennan1977 for regular ideas from my classroom!

News from Conseil scolaire acadien provincial

Au Conseil scolaire acadien provincial (CSAP), l'intégration des pratiques d'enseignement efficaces, spécifiques et harmonisées en numératie est une approche incontournable pour que les élèves développent leur plein potentiel. La participation active des enseignants et des élèves est au cœur des réussites. Le développement professionnel et l'accompagnement des enseignants sont primordiaux afin d'appuyer la croissance des habiletés liées à la numératie.

L'équipe de mathématiques au CSAP poursuit avec enthousiasme son plan d'action entamé en 2023-2024, visant à accompagner les enseignants dans la mise en œuvre des pratiques pédagogiques de la classe collabo-réflexive. Dans ce cadre, nous avons organisé des formations ciblées, des journées de jumelage pour favoriser les échanges de pratiques, ainsi que des séances d'accompagnement individualisé. De plus, nous avons intégré des moments de modelage en classe pour illustrer concrètement les stratégies pédagogiques. Cette démarche collaborative permet de créer un environnement d'apprentissage dynamique et enrichissant, au bénéfice de tous les élèves.

De plus, l'équipe continue d'ajouter des éléments au site web de numératie pour faciliter la gestion de l'apprentissage et l'accès à des ressources pour appuyer la mise en œuvre de l'enseignement efficace. Voici des exemples :

- les programmes d'études (progression des RAS);
- la concordance du programme d'études et de la ressource de base;
- une suggestion d'un plan annuel;
- des outils numériques (matériel de manipulation);
- des exemples d'activités d'apprentissage intéressantes.

Nous voulons aussi prendre cette occasion pour féliciter tous les élèves et tous les enseignants pour leur dévouement, engagement en lien avec la mise en œuvre d'une éducation inclusive de première qualité pour cette nouvelle année 2024-2025!

2024-25 Mathematics Contests and Competitions

Contest Dates:

CEMC Pascal, Cayley and Fermat Contests—February 26, 2025-These multiple choice contests are for students in grades 9, 10 and 11. They take 1 hour to complete.

CEMC Euclid Contest—April 2, 2025— The Euclid Contest gives senior-level secondary school students the opportunity to solve innovative problems using their creativity and all of the knowledge they have gained in secondary school mathematics. This 2.5 hour contest contains 10 questions including both short answer and full solution.

Purple Comet! Math Meet — April 22 through May 1, 2025—Free online competition for a team of up to 6 students. There is a ten-day window during which teams may compete choosing a start time most convenient for them. There are both a middle school and a high school competition.

Caribou Contests—offered six times per school year (October - May) -This is a series of six online math contests. Each contest is run at the 7 contest levels, Grades K/1, 2, 3/4, 5/6, 7/8, 9/10, and 11/12.

Pedagogical puritan or pragmatist?

By Amie Albrecht (@nomad_penguin). Amie is a Professor of Mathematics Education at the University of South Australia (UniSA). This article is reprinted with permission from https://amiealbrecht.com/2024/09/18/pedagogical-puritan-or-pragmatist/

In 2016, I sat in a packed lecture hall at the NCTM annual conference in San Francisco. The room was so full that people were crouched in the aisles and pressed against the walls, eager to hear a prominent educationalist talk about revolutionising mathematics education through more inclusive, progressive approaches. The talk was engaging enough, but it wasn't the speaker's message that has stayed with me all these years. The one word that comes to mind to describe the atmosphere is 'evangelical'. I was unnerved by the fervour with which the message was received.

Around the same time, another movement was taking hold, although its impact in Australia wasn't broadly noticeable until more recently. The 'direct instruction knowledge rich' cabal, as Guy Claxton[1] calls it, has now firmly taken hold and exerts powerful influence on educational policy. Once again, I'm unnerved.

These two extremes, pushing opposing philosophies, seem to dominate educational discourse. These polarising positions create false binaries that oversimplify the complexities of teaching. I now think of those who hold such rigid views as 'pedagogical puritans'. But what does pedagogical puritanism look like in practice?

Pedagogical puritanism is not just a label; it's a mindset that insists on rigid, one-size-fits-all methods. It's the belief that the 'I do, we do, you do' structure must be followed in every lesson, with no room for deviation. It's the insistence that students must understand the problem, devise a plan, carry out the plan, and review those steps every time they solve a problem—writing out and labelling each stage meticulously[2]. It's declaring that unless all fourteen practices in your framework are implemented, no significant change will occur.

None of this helps teachers or their students. I recall one memorable and disheartening occasion where I discussed the value of teaching with all three forms of problem solving (for, about, and through) at a conference. Afterwards, I was besieged by teachers from across the sector, pleading for help in navigating their school's focus on using 'through' in almost all lessons. In workshops on selecting tasks, teachers frequently express frustration at being hamstrung by mandated units of work that don't suit their specific context. Pedagogical puritanism is rife, and it's stifling both educators and learners.

●

I describe myself in social media bios as a 'dirty lefty', ironically adopting a term that Peter Dutton, now Leader of the Australian Opposition, used in a 2011 tweet to deliberately polarise the debate on refugees and immigrants. Bernard Keane wrote a good explainer here. My intent was to mock Dutton's divisive rhetoric, but as time passes, I wonder if this irony only reinforces the very divisions I wanted to critique. (After all, social media isn't exactly a place for subtlety.) As Keane asks, 'Do you become part of the anger machine, or do you find another way to answer?

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In 2017, after a long and divisive campaign marred by political failings, Australia legalised same-sex marriage. The process should have been straightforward—a parliamentary vote or even a plebiscite reflecting the electorate's views. Instead, the change came through a non-binding, voluntary postal survey sent to voters. Sally Rugg was one of the key activists for the Yes campaign. In her book How Powerful We Are, she outlines the campaign's organising strategy. The Australian voting population was divided into five groups, numbered 1-5, and categorised by their atti-

Pedagogical puritan or pragmatist?

tudes towards marriage equality.

The 1s were strong supporters—vocal advocates who attended rallies and actively promoted the cause. The 2s supported marriage equality but were less engaged, needing reminders to return their ballots. The 3s were undecided, sympathetic but unsure about the implications of changing the law, and easily swayed by fear-based arguments. The 4s opposed marriage equality, accepting LGBTQ individuals but believing in traditional marriage, while the 5s were staunchly against LGBTQ rights altogether.

Rugg believed there was no point engaging with the 5s, writing "you can't convince everyone of everything, and you shouldn't try to."[3]

●

Teaching is a complex business. I understand the desire—and the need—for theories to help make sense of the mess and for solutions that can be broadly applied. But pedagogical puritanism is narrow, as well as reductionist. It has a limited view of the purpose of education and oversimplifies the nature of teaching and learning.

For every 1 in education, there's an opposing 5. Just as in the marriage equality debate, where there were staunch supporters and vocal detractors, education is full of extremes. But is it really worth engaging with the most rigid on either side? Focusing too much on these extremes often inflames tensions rather than fostering meaningful solutions. Pedagogical puritanism is turning education into a battleground, where the real needs of students and teachers are lost amidst the noise.

So, how do we avoid becoming part of the anger machine? How do we resist engaging in these binary battles and instead focus on productive, meaningful change?

What we need is pedagogical pragmatism. An approach that recognises the diversity of classrooms, adapts to the needs of both teachers and students, and allows for flexibility. Pedagogical pragmatism acknowledges that no single framework can address the complexity of education.

Instead, it encourages us to focus on the areas where we can make real progress, rather than getting bogged down in rigid, unproductive debates.

Just as with political polarisation, the solution in education lies in moving beyond (or perhaps in from) the extremes. We must embrace complexity, rather than fearing it. We need to acknowledge that while some students thrive under structure, others need room to explore, and teachers need the freedom to adjust their methods accordingly.

Systems, sectors, and schools play a significant role in shaping how teachers approach pedagogy. Many have chosen the limitations of puritanism over the advantages of pragmatism. Some adopt a prescriptive focus, imposing rigidity and leaving little room for teachers to use their professional judgement.

Despite systemic influences, educators still have a choice. In the face of complexity and diversity in classrooms, what will you be? A puritan, holding tightly to rigid frameworks that may not serve every student? Or a pragmatist, willing to adapt, to listen, and to meet the needs of real classrooms?

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1. Claxton, G. (2021) The Future of Teaching, and the Myths that Hold it Back, Routledge. p. 10.

2. The bane of my first year mathematics course. The lecturer adhered so strictly to Pólya's problem-solving framework that it generally hindered rather than helped anyone trying to learn any actual mathematics.

3. The Yes campaign's strategy focused on mobilising the 1s and 2s, knowing that if enough people who already supported marriage equality returned their ballots, the campaign could succeed. The decision not to spend time or energy on the 3s, 4s, and 5s was based on limited resources and a pragmatic understanding that engaging with more undecided or opposed voters might dilute their efforts to mobilise the supportive base. I'm not trying to make an argument for the same strategy in pedagogical debates, although I do find it helpful to think of the 1s and 5s.

Five Games for the Final Five

By Erick Lee ([@TheErickLee](#)), MTA President, Mathematics Teacher/Registrar, Citadel High School (HRCE)

This year, classroom culture has shifted due to a new directive limiting cell phone use in public schools. Students must now turn off and store their phones during instructional time. Typically, teachers use the last few minutes of class to consolidate the lesson with an exit ticket, a closing question, or by reviewing the day's learning target. But sometimes, you might just find yourself with a time to spare. How can you use it effectively? One option is to play a quick math game. Below are a couple of short, no-preparation whole-class math games that can fill the time productively.

Mediocrity (A Game of Medians) - This is a game from Ben Orlin's book *Math Games with Bad Drawings* (which I highly recommend). Split the class into an odd number of teams and have each team choose a number between 1 and 30. The team with the middle number (i.e. the median) gets that many points (if two teams choose the same number, they each get half the points). After playing a number of rounds (corresponding with how much time you have left in class), the team with the median score wins! Check out the [full rules at this link](#).

Four Strikes - This is a [classic math game from Marilyn Burns](#). It is the familiar game of "Hangman" but guessing the digits in a number sentence instead of the letters in a word. I played this recently at NCTM 2024 in Chicago with John Golden leading 150+ teachers to guess the digits in a two digit subtraction equation. It was great fun. This is a very flexible game and you can make the equation you're trying to figure out whatever topic you're working on in class.

Pico, Fermi, Bagel - This is the classic game of "guess my number". Think of a three digit number and have students guess what it is. For each correct digit in the wrong place respond with 'Pico'. For each correct digit in the correct place respond with 'Fermi.' If there are no correct digits respond bit 'Bagel'. I originally saw this game in the book *Math for Smarty Pants* by Marilyn Burns (1982) however the game has been around since at least the early 1970s. I built a [Desmos Classroom version of this activity](#) but it is just as much fun to play on the board with the whole class.

Skunk - Skunk is a push-your-luck game that just needs a pair of dice. Students all start by standing. Two dice are rolled and if they want to bank the sum, they sit down and record it. If they want to push their luck, the remain standing. If the roll contains a 1 on either dice, everyone who is still standing gets a score of 0. Some nice probability dicsussions can result from this game. There is a screen you could project at https://www.transum.org/Maths/Game/Skunk/, but a white board and dry erase marker works just as well.

All Ten (Beast Academy) - Last year in my class, I had students do this activity individually on their cell phones. Now we all do it as a class. You could project the computer screen on your white board (or go low tech and just choose 4 numbers to write on the board). Ask students to come up with an expression to equal each of the integers from 1 to 10. If the class comes up with multiple expressions, debate which one is the most elegant and mathematically beautiful. I saw a great [post on X from Jenna Laib](#) of an elementary classroom with this game written on an "interactive white board" inviting students to write down their favourite expressions for each number.

Nova Scotia Mathematics Highlights from Social Media

Inspiring mathematics is just a click away. Check out some of the ideas and resources shared on X (Twitter) by Nova Scotian mathematics educators. Find other great tweets using hashtags like #CCRCEmath, #HRCEmath, #ITeachMath, #ThinkingClassroom and #Mathtalk .
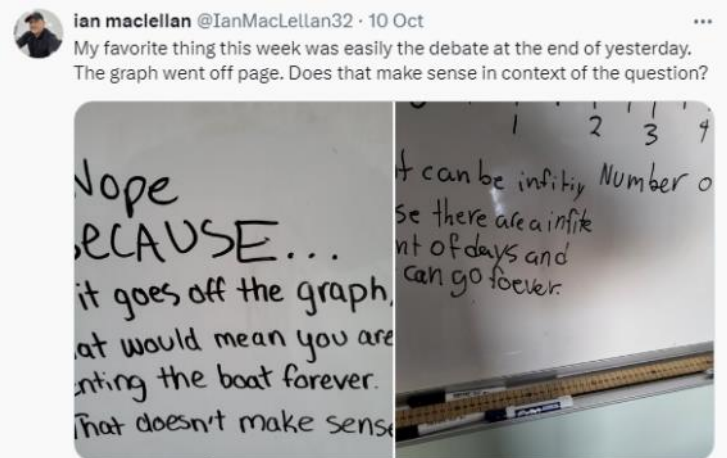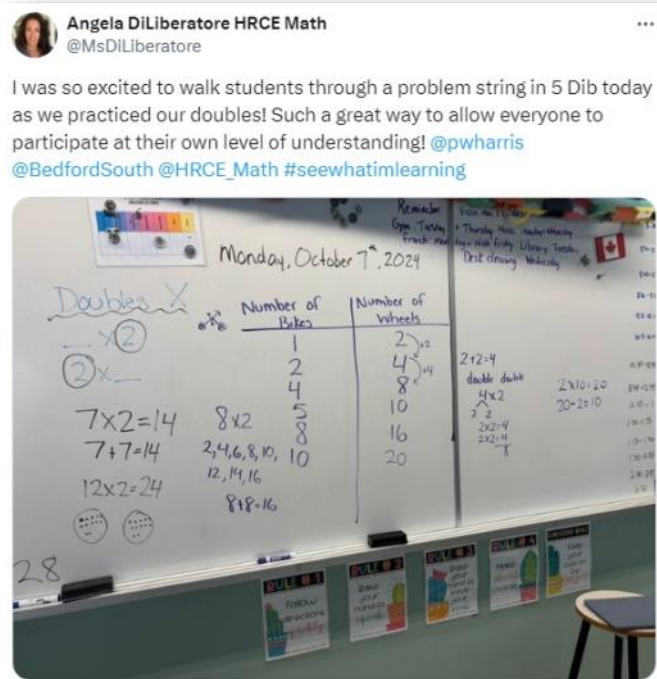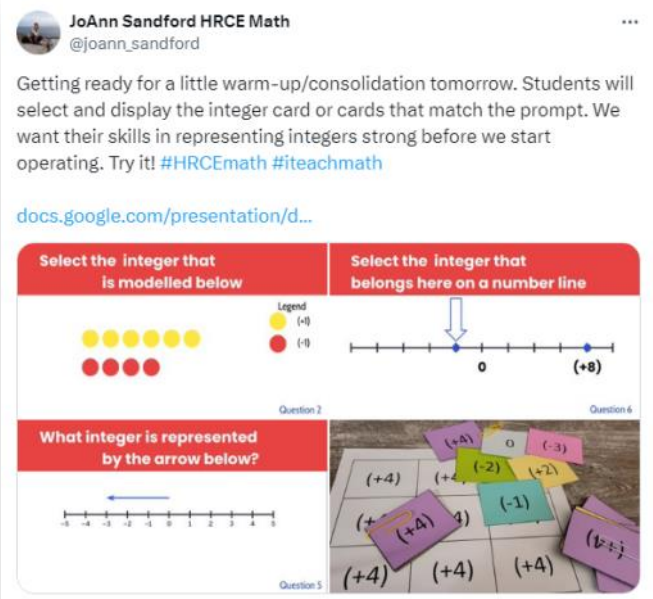
The MTA is on X (Twitter)! Follow @MTA_NS to join the conversation.

Adventures in Logic and Reasoning

Sumplete

Instructions: In Sumplete, each row and column also has a "sum clue" associated with it. This clue tells you the sum of the numbers in that row or column. For example, if the sum clue for a row is 21, then the numbers in that row must add up to 21. Your goal is to identify and cross out the numbers to delete to ensure that the sum in each column and row matches its corresponding "sum clue". Below is a simple 3x3 example puzzle and it's solution.

Example Puzzle

7	6	4	6
1	8	5	9
7	4	1	1
1	14	1	

Solution

Try puzzles below. Cross out numbers until the remaining numbers add up to the "sum clues" at the end of each row and bottom of each column.
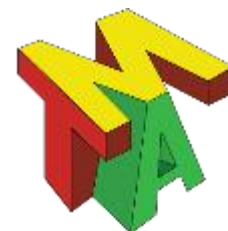
Sumplete #1: 4x4

5	6	9	2	6
3	4	3	1	7
9	2	9	8	9
2	9	5	7	5
12	6	8	1	

Sumplete #2: 5x5

2	6	5	5	2	13
3	3	9	7	7	10
9	6	5	2	2	14
1	2	7	6	6	19
9	7	3	4	3	19
23	6	15	22	9	

Enjoying these puzzles? Try the Daily 5x5 and Daily 7x7 puzzles at https://sumplete.com/. Sumplete is a logic-based game made by Daniel Tait with the help of ChatGPT. Read the story of its creation here.

Nova Scotia Math Teachers Association Executive

Below are the current members of the NS MTA Executive. The membership and the positions of the executive change each year at the Annual General Meeting held at the MTA Provincial Conference (The MTA provincial conference is on the fourth Friday in October of each year).

Name	Position	Contact
Erick Lee	President / Communications	eplee@nstu.ca
Jocelyn Procopio	Vice-President	jmprocopio@nstu.ca
David MacFarlane	Treasurer	sdmacfarlane@nstu.ca
Anne Pentecost	Secretary	adgrenier@nstu.ca
Jennifer Courish	Member-at-Large Chignecto	courishjl@nstu.ca
Kimberley McCarron	Member-at-Large Cape Breton	kamccarron@nstu.ca
Joe MacDonald	Member-at-Large South Shore	jamacdonald@nstu.ca
Cailen Langille	Member-at-Large Tri-County	cailen@nstu.ca
Brad Pemberton	Member-at-Large Annapolis Valley	bfpemberton@nstu.ca

Special Projects

The MTA strives to give back to its membership by making funding available for special projects developed by classroom teachers. If you have an innovative math education project taking place in your classroom(s), MTA may be able to offer some financial assistance to help develop the project. Information on funding can be obtained by contacting any member of the Executive.

Call for Contributions

We are better together. Mathematics Matters, the MTA newsletter, is looking for a variety of contributions from classroom teachers, math mentors and coaches, math support/intervention teachers and others who are interested in the teaching and learning of mathematics. Please consider sharing a favorite lesson or activity, a reflection or blog post, a book or technology review, or another work of interest to mathematics teachers in Nova Scotia and beyond. Sharing your ideas and reflections with other teachers is a great way to contribute to a vibrant and dynamic community of mathematics educators in our province.

If you are interested in contributing, please contact me at eplee@nstu.ca. We look forward to hearing from you!