President's Message

Summer is almost here! I think that we are all ready for the summer break to spend time with friends and family. It is also a time for reflection and rejuvenation. I hope that you all have a wonderful summer and are excited about the challenges that the next school year will bring.

The MTA is working hard to create an engaging and informative MTA conference for this coming October. We are very excited that Dr. Jennifer Bay-Williams, author of several best-selling books about Math Fluency, will be joining us as a keynote speaker. We will also be welcoming Dr. John Irving, from Saint Mary's University, who will be presenting an exciting and interactive keynote on mathematics problem solving. Many high school teachers will be familiar with John from his work with the NS High School Math League. We would also like to invite you to consider presenting at the MTA conference. You can submit a proposal here.

Erick Lee, President
Mathematics Teachers Association

Message du président

L'été est presque là! Je pense qu'on est prêts pour les vacances estivales pour passer du temps avec nos ami.e.s et nos familles. L'été nous offre l'occasion de réfléchir et de se ressourcer. Je vous souhaite un merveilleux été et j'espère que vous avez hâte de faire face aux défis que la prochaine année scolaire va vous apporter.

Les membres du Comité Exécutif de la MTA travaillent fort pour organiser une conférence engageante et informative en octobre. Nous sommes très heureux d'annoncer que Dr Jennifer Bay-Williams, auteure de plusieurs livres à succès sur la maîtrise de la Fluidité en Mathématiques, se joindra à nous en tant que conférencière principale. Nous accueillerons également Dr John Irving, de l'Université Saint Mary's, qui présentera une session passionnante et interactive au sujet de la résolution de problèmes mathématiques. De nombreux enseignants au niveau secondaire connaissent déjà John grâce à son travail au sein de la *NS High School Math League. Nous aimerions également vous inviter à envisager de vous engager en tant que présentateur/ présentatrice durant la conférence MTA. Vous pouvez soumettre une proposition ici*.

Erick Lee, Président
Mathematics Teachers Association

In This Issue

Mathematics News
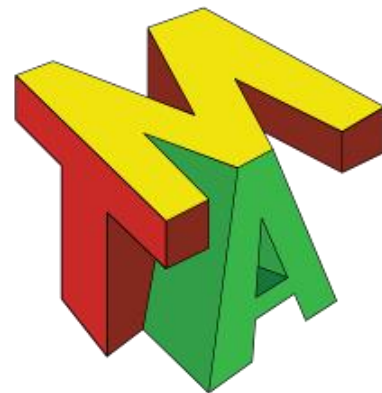
Mathematics Tasks for the Thinking Classroom, Grades K-5 — This book has just been released by Corwin Publishing in Canada. It is written by Peter Liljedahl and Maegan Giroux with illustrations by Laura Wheeler. This book is a collection of thinking tasks for the elementary classroom including 20 non-curricular and 30 curricular tasks across grades and outcomes. It also includes thoughts on how to facilitate and consolidate these tasks. It will have you thinking about how you might create your own tasks or help you select from the many tasks that you might find online.
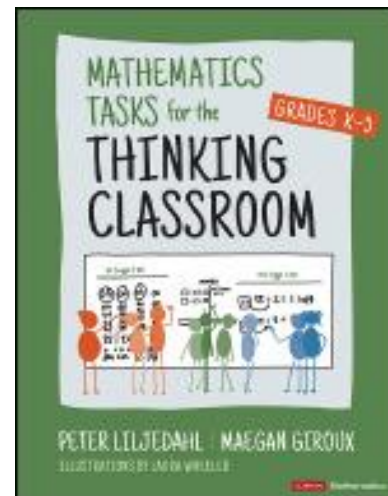
If you want to hear more about this book straight from the authors, I highly recommend the latest episode of the Think Thank Thunk podcast. In this episode, number 17, Peter and Maegan talk about the contents of the book as well as the process of writing it. They also mention that there will be a forthcoming book on tasks for the 6-12 classroom. If you're interested in Building Thinking Classrooms, I would encourage you to listen to some of the past episodes of this podcast as well. A gold mine of ideas.

Quizizz — Quizizz is an online quiz platform. It has recently introduced a number of new features. AI tools allow you to quickly import questions. Simply upload a pdf of a math worksheet and Quizizz will turn it into a self assessing online multiple choice quiz. It will recognize the question, generate the correct answer and include three distractors. This can be a quick and easy way to create a way for students to practice that includes immediate feedback. Quizizz also now includes multiple question types including sorting/categorizing questions and drawing questions.

It is now easier to access several premium features at Quizizz. The Free-For-Schools program provides all the teachers in a school 100% free lifetime access to both AI tools and 11 different question types. To unlock this access, there need to be five or more teachers at your school signed up for Quizizz. Note: This program is available for Quizizz users located in Australia, Canada, and the UK.

ZipGrade — Exams and end of the year assessments are on the horizon. ZipGrade (https://www.zipgrade.com/) is a free app for iOS and Android that lets you quickly mark multiple choice questions (as well as true/false, matching and gridded-numeric entry) using the camera on your phone or tablet. You can grade up to 100 papers each month for free. You have the ability to create custom bubble sheets to match your assessment using a Custom Form Wizard. By tagging specific questions with outcomes, you can quickly gather and record data about how students did as a class on specific units. You can

ITEM ANALYSIS

Primary Key - 25 papers

#	Answer	# Correct	% Correct	Discrim. Factor	Alt. Answers
1	C	20.0	80.0 %	0.148	B:16% D:4%
2	D	25.0	100.0 %		
3	B	22.0	88.0 %	0.646	A:12%

also quickly review an item analysis to tell you the most common alternative answers. This can be a great tool to simplify and expedite your marking at the end of the year.

MTA Conference Update — Friday, October 25th, 2024

Keynote Speaker—Dr. Jennifer Bay-Williams

Dr. Jennifer Bay-Williams is a mathematics educator, author, and leader from Kentucky, USA. She advocates for ways to develop competence and confidence in mathematics learning, especially as it relates to fluency. Her books Math Fact Fluency (about basic fact fluency) and the Figuring out Fluency series (about fluency beyond basic facts) are international best sellers. Beyond fluency, she has authored over 25 books to support effective teaching, including Elementary and Middle School: Teaching Developmentally (now in its 11th edition) with John Van de Walle and Karen Karp and Everything you Need for Mathematics Coaching with Maggie McGatha. Jennifer lives in Louisville, Kentucky where is she is professor and associate dean at the University of Louisville.

Keynote Speaker—Dr. John Irving

John Irving is an Associate Professor and Chair of the Department of Mathematics and Computing Science at Saint Mary's University in Halifax, Nova Scotia, Canada. His research focuses on algebraic combinatorics, with a particular interest in enumerative problems related to geometry and representation theory. He is dedicated to advancing mathematical knowledge and nurturing the next generation of scholars.

John will lead an interactive workshop fostering collaboration and critical thinking skills inspired by the Nova Scotia Math League, where participants will tackle problems in small groups. John will sharpen your problem-solving prowess and deepen your appreciation for the beauty of mathematics.

Location -- The MTA would like to thank Charles P. Allen High School in Bedford for once again hosting our 2024 conference. The size of this school allows us to host numerous sessions simultaneously and to make space for as many participants as we have sessions for. Being in a location that is near the centre of the province makes it reasonable for as many teachers as possible to have access to. We will be using the "cafetorium" at CPA to host the keynote sessions. Both of these keynote presenters have amazing messages to share and we want as many people as possible to be able to participate.

Speaker Proposals for 2024!—The key factor in the success of the MTA conference is the willingness of Nova Scotian educators to share their knowledge and experience. So many amazing things are happening in our mathematics classrooms that can inspire and encourage fellow teachers.

Please reflect on what you might have to offer and consider sharing. Educators can submit proposals for conference sessions using the following Google Form: https://forms.gle/htDJti1eWHgvA5oi9
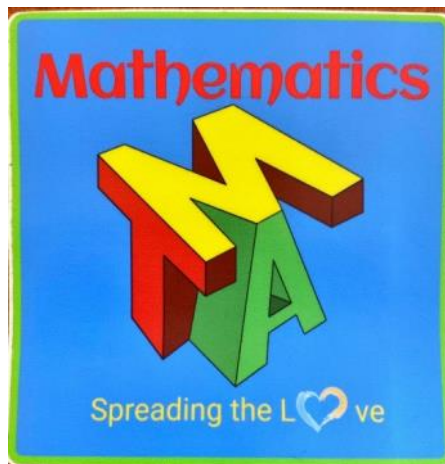
MTA Sticker Design Challenge

By Jennifer Courish, MTA Executive member and Registrar, Cobequid Educational Centre (CCRCE)

Each year as the planning gets underway for the next MTA conference, the discussion inevitably turns to what the swag should be for teachers that year. We have learned that stickers are always a big hit, so the decision was made to have a sticker again for the 2023 conference. That was the easy decision, the more difficult decision was what should the design be? Thinking that it wouldn't be too difficult a task, I volunteered to create and order the stickers. Boy, how wrong was I? I soon found myself trying to create a sticker design on various programs with little to no success. I even tried creating a design directly on the sticker company's website using their software which resulted in an epic failure! I was starting to panic as the conference was getting closer and I had to get these ordered ASAP.

As I was discussing my struggles with a colleague, they suggested asking our design or exploring tech teachers if any students would be interested in creating the design for the MTA. I reached out to our awesome technology department at Cobequid Educational Centre (CEC). Our Exploring Tech 10 teacher was in the middle of a unit on logo design (could I have been luckier?). He willingly took on the task and made it a classroom challenge for the students. Within 4 classes, I had a selection of wonderful designs to choose from. Once the winner

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

was chosen, extra stickers were ordered so that everyone in the class would get one and the winner received a few extras. It turned out to be a great exercise for the class and an opportunity for the MTA to have input from students.

We have decided to continue this contest for the 2024 MTA conference, but want to open it up to schools around the province. Do you have a class or students in your school that would like to design a sticker for the conference? We are looking for creative designs that incorporate the "Nova Scotia MTA" name with a math focus for the sticker. We will be accepting designs until September 13, 2024. Designs can be submitted to courishjl@gnspes.ca. Please save the design as a jpg, png or pdf file.

Sticker designed for the 2022 MTA Conference.

https://www.facebook.com/novascotiaMTA

https://x.com/MTA_NS

Daily Math Warmups in Mathematics 10

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

This year, I took a new job teaching Mathematics 10 at Citadel High School. Previously, I had been a mathematics consultant with the Halifax Regional Centre for Education. In returning to a classroom, I knew there were certain routines that I wanted to establish in my classroom. One was a daily warmup for the class. Having a warmup projected on the board as students enter gives the expectation that students start working right away. Not every student will choose to start working on the problem but enough do that this is a valuable tool. I got the idea for this from Geoff Krall. He shared a whole years worth of warmup questions that he had used on his website.

I have used lots of different types of warmups throughout the year and have learned a lot about facilitating them and which ones will most engage students. At the beginning of the year, I used more non-curricular warmups such as general math puzzles (e.g. [All Ten](All Ten), Nerdle, etc). This was useful to build a connection with students and encourage students to play with mathematics. As we near the end of the year, most of my warmups fall into one of four categories:

- **Formative Assessment** - a question based on what we have just learned so you can see if you really understand it or not.

- **Discussion Prompt** - a question for you to think about and join in a class discussion. Which One Doesn't Belong? and Would You Rather? are examples of this type of question.

- **Retrieval Practice** - a chance to retrieve from memory skills from earlier in the year or previous years.

- **Choice Task** - A chance to answer a question at different levels of difficulty. An opportunity to challenge yourself in a no-stakes/safe environment.

Of these warmups, my students tell me that retrieval practice is the one they feel best support their learning and understanding of the course material. Perhaps this is because I reiterate the role of retrieval practice in promoting long term retention of skills each time we do it. They find the discussion prompts as the most engaging and fun.

If you'd like to check out my daily Math 10 warmup questions, you can find them organized by unit here:

- Measurement
- Trigonometry
- Finance
- Relations and Functions
- Polynomials
- Roots and Powers
- Linear Functions
- Systems of Equations

It All Starts Here: Register your students for the Canadian Mathematical Society's Mathematics Competitions

By Termeh Kousha, Executive Director, Canadian Mathematical Society

Mathematics competitions are a fun activity for students of all ages. Since 1969, the CMS has been staging national math competitions and camps to encourage students to explore, discover, and learn more about mathematics and problem solving. Along the way, thousands of students have become more comfortable with math and more confident in what they can achieve.

The Canada Lynx Mathematics Competition: A Fun, Inclusive Introduction to Math Competitions

The newly launched Canada Lynx Mathematics Competition (CLMC) is an inclusive national mathematics contest that provides feedback upon completion of the exam to help develop students' skills in math. This competition, lasting 90 minutes and consisting of 15 multiple-choice questions, is open to students in grades K-12, and suggested for students in grades 7 to 12. The CLMC's aim is to foster an interest in mathematics among students regardless of their skill level, to increase student confidence in their math abilities, and to present mathematics as a fun and playful subject. The competition takes place at the end of September or beginning of October each year. This allows teachers to use the CLMC as an excellent tool to assess their students at the beginning of the school year. By participating in the contest, students can earn a chance to win cool prizes and awards.

The Canadian Open Mathematics Challenge: A Chance To Become a Canadian Olympian

This flagship national competition is open to any primary and secondary student in any location. It attracts thousands of participants from across Canada and internationally each year. Although the competition is targeted at upper-level high school students, performance awards are available at multiple grade levels. Top performing students receive certificates, and their school receives a plaque. Furthermore, students may be considered for an invitation to a CMS regional, specialty, or national math camp. The competition lasts 2.5 hours and is normally staged at schools in the fall. While it is nationally focused, performance is recognized as "best in Canada" and "best in grade in Canada", as well as "best in the province" and "best in grade in the province". In addition to awards, plaques, certificates, and prizes, top-performing students are also automatically invited to participate in more advanced CMS competitions. In fact, for advanced students, the COMC is the first step to competing on international stages. Beyond the COMC, listed below are the competitions that lead to the qualification of students at the International Mathematical Olympiad.

The Canadian Mathematical Olympiad Qualifying Repêchage – Students who come very close to qualifying for an invitation to the CMO (next step) are invited to participate in the take-home Canadian Mathematical Olympiad Qualifying Repêchage (CMOQR) in early February. Around 75 students are given eight problems to solve. The CMOQR is a week-long exam completed online. It is not quantitively scored, but evaluators choose the most insightful correct answers and offer the top 20 best-performing students an invitation to the CMO.

Canadian Mathematical Olympiad – The Canadian Mathematical Olympiad (CMO) is Canada's premier national advanced mathematics competition. Candidates are invited to write the CMO based upon excellent performance in the COMC or the CMOQR. This three-hour advanced competition is usually written in each student's school in late March and typically consists of five challenging math problems.

Competing on the World Stage - Candidates with excellent performance in the CMO, the CMS Math Training Camps, and, in part, in other mathematics competitions, are selected to be part of Math Team Canada and compete on the world stage at the International Mathematical Olympiad (IMO) or the European Girls' Mathematical Olympiad (EGMO).

CMS Mathematics Competitions… continued

***International Mathematical Olympiad* (IMO)** – The IMO is the world championship mathematics competition for high school students. Math Team Canada is chosen from top ranking students. Canadian students have consistently performed very well on the international stage at the IMO competition. The IMO is an intense, world-class, two-day contest. Each day, students have 4.5 hours to solve three questions. The CMS selects six students to form Math Team Canada and assembles training and coaching staff to provide an intense preparation program. Training takes place at the Banff International Research Station (BIRS), or at the University of Waterloo, before the team travels to the IMO venue.

***European Girls' Mathematical Olympiad* (EGMO)** – The EGMO is an international mathematics competition that focuses on female high school students whose commitment to mathematics goes beyond the usual curriculum. As such, it is an additional opportunity for the participating countries to counteract the low proportion of women. The long-term goal of the EGMO is to raise the proportion of students identifying as female participating in the IMO. The four competitors who represent Canada are selected based on excellent performance in the COMC and an additional EGMO team-selection test held in January.

The Canada Jay Mathematics Competition: An Engaging Fall Activity

The Canada Jay Mathematical Competition (CJMC) is a Canadian math competition open to students in grades K to 8. This competition is 90 minutes long and consists of 15 multiple-choice questions based on the grades 5-8 curriculum. The problems are organized in 3 blocks of 5 questions with an increasing level of difficulty from beginning to end. The CJMC is a fun fall activity for students, and allows teachers to complement their math curriculum and build students' problem-solving skills.

Preparing for the Contests

In order to assess the difficulty of typical CMS competitions (CLMC, COMC, CJMC, CMOQR and CMO), you may visit our website where exams are archived (pages listed below). You may also visit this page to learn about resources you and your students may use when preparing for CMS competitions. Moreover, beginning in the first week of September, a Problem of the Week will be posted on the COMC website each week leading up to the COMC as a tool to prepare for the competition.

- CLMC Exam Archive (click on the "Show the [competition] Exam Archive")
- COMC Exam Archive (click on the "Show the [competition] Exam Archive")
- CJMC Exam Archive (click on the "Show the [competition] Exam Archive")
- CMOQR Exam Archive (scroll down to the bottom of the page)
- CMO Exam Archive (scroll down to the middle of the page)

Registration

The 2024 CMS Competitions will be held on the following dates:

    CLMC: October 3
    COMC: October 30
    CJMC: November 21

Registration for all competitions will open in early September. To register your students, visit https://cms.math.ca/competitions/.

We hope to have you and your students among the candidates for the CMS competitions this fall! If you have any questions, please contact us at contests@cms.math.ca.

Canadian Mathematical Society
Société mathématique du Canada

CANADA LYNX MATHEMATICAL COMPETITION

MULTIPLE CHOICE!

OCT 3 2024

#CLMC

SUGGESTED FOR GRADES 7 TO 12

CANADIAN OPEN MATHEMATICS CHALLENGE

#COMC

OCT 30 2024

IT ALL STARTS HERE!

SUGGESTED FOR GRADES 7 TO 12

CANADA JAY MATHEMATICAL COMPETITION

MULTIPLE CHOICE!

#CJMC

• OPEN TO ALL STUDENTS
• THE MOST PRESTIGIOUS MATH EXAM IN CANADA
• COMC IS THE ONLY WAY TO REPRESENT TEAM CANADA IN THE INTERNATIONAL STAGES

OPEN TO GRADES K TO 8

NOV 21 2024

CMS.MATH.CA

Nova Scotia Mathematics Highlights from X

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 .

Maggie MacPhee
@macphee_maggie
Following

Bringing thinking classrooms outside in Math 8 today
#ccrcemath #buildingthinkingclassrooms

Lisa Lunney Borden @LLB_315 · 20 May
Proud to have been part of the team who crafted this and excited to see it being shared.
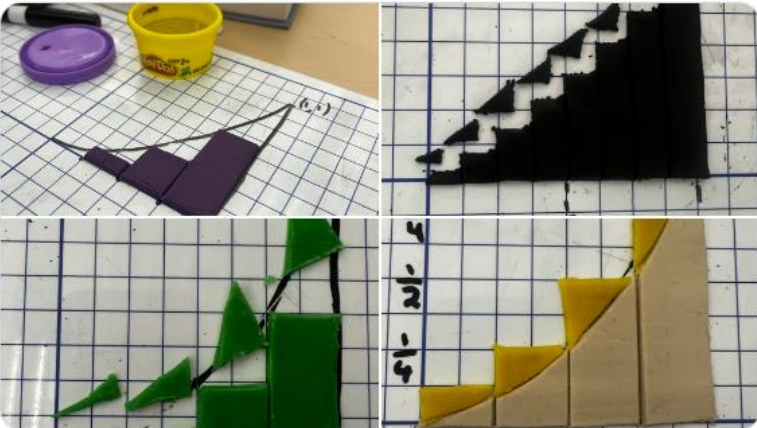
NCTM @NCTM · 20 May
Our position statement on the intersection of culture and math is out now: nctm.link/ve9pn

Join us this Thursday to learn how to integrate culturally responsive practices into #mathematics learning: nctm.link/DHXfV

Mathematics is not culture neutral.

Effective mathematics instruction leverages cultural knowledge and lived experiences as assets.

Effective mathematics teachers are culturally conscious.

Effective schools develop systemic approaches that embrace culturally relevant mathematics instruction.
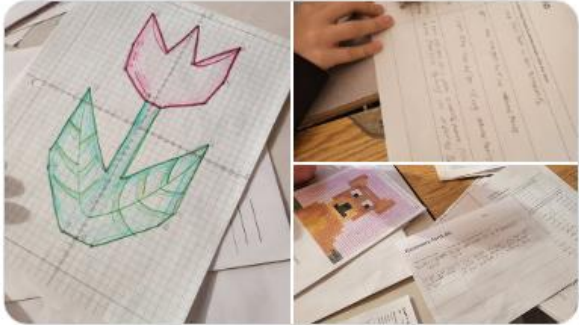

Ms. Procopio
@Mathematicspro

Using play-doh in #Calculus to show left approximation method. Also introducing Integral notation.

JoAnn Sandford HRCE Math
@joann_sandford

Today, students selected their best artifacts to include in their Geometry Portfolio. They listed the item and what learning it demonstrated.
#iteachmath #HRCEmath #mtbos

Adventures in Logic and Reasoning

DIVISIBILITY PUZZLE

Place the digits 0-9 in each space to make ten true statements. Use each digit exactly one time.

0	1	2	3	4	5	6	7	8	9

2___ is divisible by 5.

6___ is divisible by 4.

___8 is divisible by 9.

___2 is divisible by 3.

___6 is divisible by 8.

2___ is divisible by 7.

5___ is divisible by 10.

___4 is divisible by 6.

7___ is divisible by 2.

9___ is divisible by 3.

Created by Sarah Carter | @mathequalslove | mathequalslove.net | **M + A + T + H = *love***

Instructions:

Place the digits 0-9 in each space to make ten true statements involving divisibility rules. Use each digit exactly one time. (For younger students, you might start by asking them to place any digit in each blank to make a true statement and then add the challenge to use each digit as few times as possible.)

This divisibility puzzle was created by Sarah Carter (@mathequalslove), a high school math and science teacher from Oklahoma. The puzzle is shared on her blog, Math = Love at https://mathequalslove.net/divisibility-puzzle/. She has lots of additional classroom math puzzles shared on her fantastic site. Check it out!

Visit https://www.openmiddle.com/ for a searchable database of additional math puzzles in this same style.

Problem 134. Digits and Primes

Henry E. Dudeney (1857-1930)was a prolific creator of mathematical puzzles and brainteasers. The puzzle below comes from his book, 536 Puzzles and Curious Problems

Using the nine digits once, and once only, can you find prime numbers (numbers that cannot be divided, without remainder, by any number except 1 and itself) that will add up to the smallest total possible? Here is an example. The four prime numbers contain all the nine digits once, and once only, and add up to 450, but this total can be considerably reduced. It is quite an easy puzzle.

$$
\begin{array}{r}
6\,1 \\
2\,8\,3 \\
4\,7 \\
5\,9 \\
\hline
4\,5\,0
\end{array}
$$

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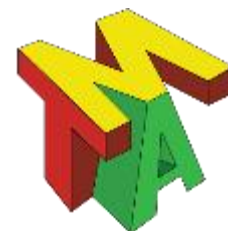
Below are the current members of the NS MTA Executive. The membership and the positions of the executive change each year at the Annual General Meeting held at the MTA Provincial Conference (The MTA provincial conference is on the fourth Friday in October of each year).

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!