Upcoming NCTM Events

ANNUAL MEETING

Washington, DC | Oct. 25–28
2023

Chicago, IL | Sept. 25–28
2024

REGIONAL CONFERENCE & EXPOSITION

Seattle, WA | Feb. 7–9
2024

VIRTUAL CONFERENCE

Virtual | Mar. 29–Apr. 1
2023

NCTM®
NATIONAL COUNCIL OF TEACHERS OF MATHEMATICS
HOST
Maryland Council of Teachers of Mathematics

MEETING FACILITY
All Regional Conference presentations will be held at the Baltimore Convention Center. See pages 64–67 for floor plans.

REGISTRATION
Wednesday 7:30 a.m. – 7:00 p.m.
Thursday 7:00 a.m. – 5:00 p.m.
Friday 7:00 a.m. – 2:00 p.m.

EXHIBITS AND NCTM CENTRAL
Wednesday 4:00 p.m. – 6:00 p.m.
Thursday 9:00 a.m. – 5:00 p.m.
Friday 9:00 a.m. – 2:00 p.m.

The publications and programs of the National Council of Teachers of Mathematics (NCTM) present a variety of viewpoints. The content, affiliations, and views expressed or implied in this publication, unless otherwise noted, should not be interpreted as official positions of NCTM. References to particular commercial products by a speaker should not be construed as an NCTM endorsement of said product(s). NCTM reserves the right to change speakers, change facilities, or modify program content.

nctm.org/baltimore2022
Welcome to Baltimore! The planning and preparation for this National Council of Teachers of Mathematics NCTM Regional Conference and Exposition has been extensive, and it is our hope that your experience will be personally and professionally rewarding. Presenters included in this program have traveled from near and far to enthusiastically share best practices that support NCTM’s vision which ensure student access to the highest quality mathematics teaching and learning within a world where stakeholders see the value and beauty of mathematics. We hope that your time in Baltimore allows you learn and grow with colleagues and the conversations you begin lead to new and exciting experiences for you and your students in the schools and districts you serve.

The presentations included in this conference program are aligned with strands inspired by the program committee’s reflection and discussion about sparking joy and passion for mathematics within our schools and learning communities. We are excited to be partnering with bestselling author Ken Williams for the opening session of the conference and hope this experience will allow you to connect with one or more of these strands to center your learning during your time in Baltimore.

- Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
- Ignite Your Community: Partnering to Plan and Support Success for Students
- Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
- Ignite Your Power: Lifting Up Each and Every Person
- Ignite Student Learning: Capitalizing on the Formative Assessment Process

While you are here in Baltimore, we hope you take the opportunity to venture out into the Stadium District, Federal Hill, and Fells Point to take advantage of the Baltimore foodie scene to find the perfect crab cake, join us for Purple Friday, and look for our state flag everywhere because we put it on everything.

Finally, we know there are numerous opportunities for in-person and online professional development, and we are excited that you are here in Baltimore. Thank you for taking time to learn and grow with us! On behalf of the Program Committee, the NCTM Staff, the Volunteer Committee, and the many volunteers from the Maryland Council of Teachers of Mathematics we hope you enjoy this Regional Conference & Exposition!
New and Preservice Teachers Workshop

Wondering how to manage your classroom, work with parents, find engaging lessons, and handle homework—all while keeping your sanity? You’re not alone! A must for every new teacher, this interactive workshop is your chance to ask questions on topics of your choice. Plus, you will connect with other new and early-career teachers. If you are in the first five years of teaching or are seeking certification, come get resources, materials, and fun prizes to encourage you and give you insight along your journey.

Thursday and Friday
9:45 a.m.–11:00 a.m.
Room: 314

Types of Presentations

All presentations are open to all conference participants. Admission is on a first-come, first-served basis. Reserving spaces in line or saving seats is not permitted.

Sessions (60 minutes) represent a common format during which speakers relate their ideas to an audience. Rooms are either theater style or classroom style and vary in size.

Workshops (75 minutes) are rooms set with round tables for hands-on work.

Bursts (30 minutes) are presentations that focus on a specific topic or idea. Rooms are set with round tables. The goal is information sharing, conveyed quickly and succinctly.

Exhibitor Workshops (60 minutes) are opportunities for exhibitors to showcase their products and services away from the Exhibit Hall. Look for the symbol indicating exhibitor workshops in the program book.

Insightful Education Sessions, Dynamic Exhibits

NCTM Regional Conferences & Expositions are an opportunity to share knowledge and learn with leaders in mathematics education. Gain new strategies to unleash the mathematical mind of each and every student.

- Improve your knowledge and skills with high-quality professional development and hands-on activities.
- Connect and share with peers from throughout the region.
- Collect free activities to engage and excite your students.
- Explore an exhibit hall packed with exciting learning and giveaways.
- Learn from education leaders and test the latest educational resources.

You will walk away with the following:

- Innovative ideas you can immediately use
- Updates on classroom best practices from recognized innovators
- In-depth discussions about the latest education resources
- Knowledge-sharing with like-minded peers
- Interaction with the latest tools and products in the Exhibit Hall

Regional Conference Overview and Orientation

Whether you’re new to NCTM or a seasoned veteran, there is something new at the conference for everyone! Hosted by members of the Board of Directors, this session will show you how to maximize your overall conference experience. Learn all the new, innovative aspects this year’s meeting is showcasing or discover something you’ve missed in the past. Find out how to navigate presentations, learn how to use the conference app, and network with other attendees.

Thursday and Friday 7:15 a.m.–7:45 a.m. Room: 307
Tips for a Rewarding Regional Conference & Exposition

- Access the conference app for program and speaker information, to connect with other attendees, and to share your feedback. Visit nctm.org/confapp.
- Get available speaker handouts at nctm.org/planBaltimore.
- Keep the conversations going, connect with other attendees and speakers, access and share session resources, ask questions, and more in the MyNCTM online community at nctm.org/community.
- If you’re experiencing the conference with your colleagues, attend different presentations and share ideas with one another after the conference.
- Silence your cell phone during presentations.
- Be safe! Remove your name badge when you leave the conference facilities.
- Coffee, snacks and lunch are available for purchase at both Market Fresh and the Cafe Concession outside exhibit Hall A, during Registration as well as Exhibit Hall Open hours.

Registration and Access to Presentations

Registration will be located at the Baltimore Convention Center in Hall ABC. You must wear your badge to attend all presentations and to enter the NCTM Exhibit Hall. You will need to show a picture ID to have your badge reprinted.

By registering and attending an NCTM conference, meeting, or other activity, participants grant NCTM the right to use their likeness or voice as recorded on, or transferred to, video, social media, photographs, websites, electronic reproductions, audio files, and/or other media of such events and activities.

Event Code of Conduct

All communication at NCTM events should be appropriate for a professional audience, including people of many different backgrounds regardless of gender, gender identity and expression, age, sexual orientation, disability, physical appearance, body size, race, ethnicity, or religion. By attending an NCTM event, you agree to adhere to our Code of Conduct policies. nctm.org/policies

NCTM’S Plans for a Healthy and Productive Event

As the COVID-19 pandemic transitions to an endemic with vaccinations, widely available rapid tests, and high-quality masks easily obtainable and affordable, NCTM will emphasize focusing on personal responsibility for NCTM in-person events. This includes:

- Staying home and not attending or participating in the conference if you are sick or not feeling well.
- Protecting yourself. Speak with your healthcare provider about appropriate and available vaccinations and boosters. Mask-wearing is encouraged.
- Getting tested before you arrive to the conference. This will provide another level of safety for your fellow attendees.
- Maintaining social distancing and asking permission before shaking hands, giving high-fives, or hugs.
- Washing your hands/using hand sanitizer frequently.

Below are some steps NCTM will be taking to help create a safe and productive event. We also encourage attendees to stay up-to-date with Baltimore City public health recommendations prior to and during your visit.

Masks

NCTM follows the Centers for Disease Control and Prevention and local and state guidelines for health and safety at in-person events. Per the most recent guidance protocols from the CDC, counties are assessed based on multiple factors and classified by Green, Yellow, or Red. Baltimore is currently in the Green or “Low” category and people may choose to mask at any time. View current information on wearing masks in Baltimore COVID-19 by County|CDC.

Venue

The Baltimore Convention Center has received a GBAC STAR™ accreditation for facilities. Enhanced cleaning and safety measures for the venue include, but are not limited to the following:

- Lobbies, public spaces, and other high-traffic areas are equipped with stations offering both hand gel and disinfecting wipes
- Enhanced cleaning for high touch points in public spaces, including doorknobs, elevator controls, escalator rails, and restrooms
- Electrostatic sprayers have been put into use for sanitizing the facility.
- Touchless payment transactions are available at food stations.
- Auto-fill bottle water fountains are available throughout the facility near restrooms for easy access.
Program Information

Hotels
Hotels that implemented enhanced rigorous cleanliness protocols are included in NCTM’s hotel block.

Contactless Payments
As part of our health and safety protocols, NCTM will provide contactless payment options at NCTM registration, the NCTM Bookstore and NCTM Central. Accepted credit card payments will include any US- and most internationally issued magstripe or chip cards bearing a Visa, Mastercard, American Express, or Discover logo. Checks may be accepted for the exact amount at registration only. All payments are to be made in United States Dollars (USD$). No cash payments. Please check with individual exhibitors and sponsors for their onsite payment policies.

Skilled Staff
- All convention center employees have received training regarding coronavirus safety. Individuals performing cleaning and housekeeping duties have received additional training regarding cleaning methods, product use, and other activities.

Hand Sanitizer
- Contactless hand sanitizing stations are available throughout the building for all individuals.

Medical Care
- The First Aid Room will be located in the Charles Street North office at the Baltimore Convention Center during the conference. First-aid staff will be able to assist attendees or exhibitors as needed. The City of Baltimore is also the home of some of the nation’s leading medical facilities. Three first-class facilities are in or near the downtown area near the Baltimore Convention Center: The University of Maryland Medical Center, Johns Hopkins Hospital, and Mercy Medical Center.

Exposition Hall
- To accommodate social distancing, NCTM has increased the aisle width in the exposition hall to allow for less congested traffic flow between booths.
- Signage will be placed to remind attendees and exhibitors of social distancing and hygiene recommendations.

Social Distancing
- Avoid physical contact, including hugs and handshakes.
- Signage will be used to encourage social distancing in common areas.

Grade Bands
To help you find appropriate presentations to attend, each presentation lists the presentation’s target grade-band audience:
- PreK–Grade 2
- Grades 3–5
- Grades 6–8
- Grades 8–10
- Grades 10–12
- Higher Education—university- and college-level issues (including both two-year and four-year institutions)
- Research
- Coaches/Leaders/Teacher Educators
- General Interest—issues of interest to multiple grades and audiences

Online Conference Planner
The Online Conference Planner is a great way for you to search the conference program book, set up your personal schedule, and download available presentation handouts. The Online Conference Planner is continually updated with the latest presentation changes and information. Visit nctm.org/planBaltimore to check it out.

Program Updates
To see the program schedule, including the latest changes, cancellations and additions visit the Baltimore Program Schedule to link to the online conference planner. You can also follow along with the conference app NCTM Central to view event alerts and up-to-the-minute information.

ATTENDEE SERVICES

ADA Services
NCTM is committed to ensuring that our events are fully accessible to all persons. Visit Accessibility and Inclusion to learn about ADA Services available for the Baltimore Regional Conference and Exposition.

All Gender Restrooms
All gender restrooms are located throughout the Baltimore Convention Center, specifically across from Market Fresh, the Pratt Street lobby, the Howard Street lobby, and on the 400 level. Converted restrooms indicated with a red asterisk on our floor plans listed on page 66.
NCTM App
Start planning early and stay connected throughout the event with the NCTM mobile app. Whether you have an iPhone®, iPad®, Android™, or tablet, the app is your onsite sidekick! Get the app and select your event to access these features and more.

- **Notifications**—View event alerts and up-to-the-minute information.
- **Schedule**—Search sessions and speakers, create your own itinerary, download handouts, take notes, and make personal appointments.
- **Exhibitors**—Search, filter, take notes, and contact and mark exhibitors to visit.
- **Directory**—Create your own profile and search for and message other attendees.
- **Maps**—View floor plans and maps.

Visit [nctm.org/confapp](http://nctm.org/confapp) for more information.

Nursing Rooms
Nursing Rooms are available in the Baltimore Convention Center in the Charles Street North and Howard Street Lobby.

Wi-Fi
Complimentary wi-fi will be available for NCTM Regional Conference & Exposition.

Username: NCTM  
Password: NCTM2022

The BOOKMOBILE at NCTM Central
Check out the totally redesigned, and cashless, bookstore at NCTM Central. Shop NCTM’s newest titles, best-sellers, and math-themed products for great gifts and incentives. Get your Notice and Wonder merch here! Save up to 35% on list-price books and get free shipping* on all books purchased through the Online Bookstore. Preview at [nctm.org/catalog](http://nctm.org/catalog).

Get customized NCTM Regional Conference apparel printed right in front of you! Select the design, color, and style that’s uniquely you! Notice and Wonder tees—Regional Conference hoodies—so many colors and styles!

*Discount and free standard shipping are limited to NCTM Baltimore 2022 Regional Meeting Badge Holders who purchase as individuals from the online NCTM bookstore from November 30 through December 2, 2022. Free shipping limited to the contiguous United States. Discounts and free shipping do not apply to purchase orders.

Note on sales tax exemptions: To be considered exempt from sales tax in the NCTM Bookstore, you must provide a copy of a Maryland tax exemption certificate at the time of purchase. NCTM is required by law to keep a copy of the certificate; we cannot return it to you. To qualify, you must pay with a purchase order, check, or credit card from the school to which the Maryland exemption certificate is issued. NCTM cannot accept personal checks, personal credit cards, or cash in conjunction with tax exemption certificates. Tax exemption certificates for states other than Maryland are not valid for this Regional Conference.
NCTM Central

Make your meeting experience complete with a visit to NCTM Central in the Exhibit Hall during exhibit hours.

- **Wednesday**: 4:00 p.m.–6:00 p.m.
- **Thursday**: 9:00 a.m.–5:00 p.m.
- **Friday**: 9:00 a.m.–2:00 p.m.

Learn how NCTM supports you and the field of mathematics education:

- Get sample journals and more at **Member Services**. Take the opportunity to update your membership information and learn about your benefits.
- Discover available funding and resources to support you in your career and professional development through the **Mathematics Education Trust (MET)**.
- Check out **Classroom Resources** and learn about NCTM’s collection of lesson plans, problems, and more.
- The **Networking Lounge** is a prime location to meet up with colleagues between presentations! Whether you want to make connections with fellow conference goers, exchange teaching tips, or catch up with friends, you’ll find a comfortable spot in the Networking Lounge. Relax and recharge—make use of charging stations while you reflect with colleagues.
- Learn about NCTM’s **Professional Development** offerings. Information will be available about NCTM’s Professional Learning Services and upcoming Regional Conferences & Annual Meetings.

Information Booth

The NCTM Information Booth will be located in the Charles Street Lobby outside of Exhibit Halls ABC. Staff can answer your questions about Baltimore and assist you with directions and local information, from transportation and historical sites to shopping and entertainment. In addition, you may retrieve or turn in lost-and-found items at the Information Booth. Unclaimed items will be turned over to Baltimore Convention Center Security.

First-Aid Station

The First Aid Room will be located in the Charles Street North office at the Baltimore Convention Center during the conference. If you need medical services while in Baltimore, please check with the hotel concierge for the closest medical facilities. For any medical emergency, call 911 without hesitation.

For Your Child’s Safety

During installation and dismantle, no one under the age of 16 will be allowed in the Exhibit Hall. Due to the size and professional nature of the conference, and for your child’s safety, children under the age of 16 are not permitted in the Exhibit Hall during show hours. Exceptions to this rule will be made for parents with nursing infants.

Exhibits

Make time to visit the Exhibit Hall. The hours allow ample opportunity to explore, test, and purchase resources for your classroom. You’ll also be able to meet product specialists, get fresh ideas, and watch demonstrations on how products will help you in your classroom. We’ve provided dedicated time to visit the exhibits; no presentations will take place from 12:00 p.m. to 1:00 p.m. on Thursday and Friday. Check out the map of the Exhibit Hall on page 64 and the list of exhibits on pages 68–72.

Exhibitor Workshops

Do you want more in-depth, personal interaction with exhibitors? If so, plan to attend the Exhibitor Workshops. These workshops are held on Thursday and Friday and offer a wide variety of topics. For exhibitor workshop offerings, look for presentations in this program marked with the symbol.

Speaker Handouts

Access available electronic presentation handouts through the conference app and online planner at nctm.org/planBaltimore. Handouts will be available for one month after the conference ends.

Set Up A Meeting Spot

Our diverse community holds many interests through and beyond mathematics education. The Meeting Spot in NCTM Central is a way to find those with shared interests at the Baltimore Regional Conference. From meeting up to find a local Karaoke spot to getting a small group together to collaborate on one of the conference strands. You choose the topics.

All who want to participate are invited. If you’re interested in organizing or joining a Meeting Spot, click on the Meeting Spot tile in the NCTM Central mobile app and learn more!
Program Information

Conference Strands

IGNITE YOUR AWARENESS: INTEGRATING SOCIAL-EMOTIONAL AND ACADEMIC LEARNING

Teachers, students, and the community have a variety of needs that emerge in the context of the teaching and learning of mathematics, falling into one or more of the following components:

- Self-Awareness: Recognizing teachers’ and students’ strengths within our math lessons
- Self-Management: Promoting strategies that decrease stress and promote healing and well-being for teachers and students; outcomes reinforce the mathematics concept and offer students the opportunity to problem solve, plan, and organize their product.
- Social Awareness: Encouraging social skills to build confidence within the teaching and learning process
- Relationship Skills: Examining how to establish relationships to positively influence students’ learning of mathematics and fostering these relationships
- Responsible Decision Making: Encouraging improvement using language such as “not yet” versus “not” and rewarding effort alongside success; students are given autonomy in their approach but also challenged to use a variety of critical thinking skills during the process, in order to gain a better understanding of how their decisions influence learning.

Sessions in this strand will include ways to integrate mathematics teaching and social-emotional learning strategies in the classroom.

IGNITE YOUR COMMUNITY: PARTNERING TO PLAN AND SUPPORT SUCCESS FOR STUDENTS

The past two years have promoted an increased sense of isolation within the traditional school community as digital platforms have moved to the forefront for teachers, students, and families to connect with one another. Teachers’ intrinsic motivation for lesson planning and preparation propels their drive to build confidence, accelerate learning, and reduce anxiety for students and parents, regardless of the classroom setting. How does sharing your passion for teaching and learning renew your sense of energy within your school community? Sessions in this strand will focus on lessons learned for fostering a sense of collaboration and community—with teachers, coaches, students, and families—that foster student learning.

IGNITE STUDENTS’ ENGAGEMENT WITH THE MATHEMATICAL PRACTICES: PROMOTING JOY IN THE CLASSROOM

The moment students “flip the switch” brings teachers and students joy in the classroom. Teachers leverage the Common Core State Standards for Mathematical Practice to achieve aha moments for students as they consider such questions as these:

- Which games promote students as problem solvers?
- Which technology helps ensure students strategize as they reason mathematically?

- Which practices stimulate student-centered talk to deepen their understanding?
- How can mathematical writers share arguments and explanations?
- What approaches to reading encourage students to make sense of mathematics?
- How does the use of hands-on materials promote learning and support reasoning?

Sessions in this strand will share ways to forefront students’ sense making while remaining confident they will address the required content.

IGNITE YOUR POWER: LIFTING UP EACH AND EVERY PERSON

Teachers, students, and the community have a variety of needs related to diversity, equity, and inclusion that emerge in the context of the teaching and learning of mathematics.

- Diversity is centered as teachers honor, respect, and include the personal stories of every student and teacher in the classroom to develop cultural competence through their math lessons, often involving people from different social, ethnic, gender, and sexual orientations.
- Inclusion ensures all students are empowered through groupings that recognize diverse backgrounds, abilities, and opportunities and use the strengths of each group member as a resource to achieve and succeed, which ultimately provides equal access to opportunities and resources for students who might otherwise be excluded or marginalized.
- Equity recognizes that each person has different circumstances and allocates the exact resources and opportunities needed to reach an equal outcome. Equitable and transparent classrooms provide support to each and every student to link everyone’s needs to the goals and high expectations of their teacher through various lessons.

Sessions in this strand will identify diversity, inclusion, or equity as their focus and showcase practices that foster every student’s mathematical agency, belonging, and joy to provide ways to create bonds and allies to overcome barriers.

IGNITE STUDENT LEARNING: CAPITALIZING ON THE FORMATIVE ASSESSMENT PROCESS

Establishing a picture of student experience and understanding sets the stage for effective instruction. Varied instructional models used during pandemic learning have exacerbated learning gaps and affected student ability to demonstrate mastery of grade-level standards. The formative assessment process that identifies actionable data to support and extend learning is essential now more than ever. How has the formative assessment process helped guide instructional changes leading to student success? Sessions in this strand focus on how teachers engage in the formative assessment process to scaffold content, address student misconceptions, and engage in best practices for building student confidence and understanding to advance learning.
Coronavirus Health & Safety Tips

- Wear a mask that covers your nose and mouth
- Maintain proper social distancing of 6 feet/2 meters
- Wash your hands often
- Use hand sanitizer
- Avoid shaking hands, high-fives, and hugs
- Clean your electronics
- Use your own supplies
Opening Session: Ruthless Equity: Disrupt the Status Quo and Ensure Learning for all Students

General Interest Session
Baltimore Convention Center, Ballroom 2

In this powerful status-quo-disrupting examination of the internal obstacles to ensuring high levels of learning for every student, bestselling author Ken Williams empowers educators with the tools to identify and defeat the enemy of equity. Participants will discover the many subtle and seductive forms this enemy takes, and the mindset and practices required to defeat it. This session will galvanize every educator to deliver on the promise of equity, excellence and achievement for ALL students, regardless of background.

Ken Williams, Unfold The Soul, Inc., Sharpsburg, Georgia

Regional Conference Overview and Orientation

General Interest Workshop
Baltimore Convention Center, 307

Whether you’re new to NCTM or a seasoned veteran, there is something for you at the conference! Hosted by members of the Board of Directors, this session will show you how to maximize your overall conference experience. Learn all the new, innovative aspects this year’s meeting is showcasing or discover something you’ve missed in the past. Find out how to navigate presentations, learn how to use the conference app, and network with other attendees.

Zandra de Araujo, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Florida, Gainesville
Twitter: @zdearaujo

Need funding for professional development? Check out grant opportunities from the Mathematics Education Trust at nctm.org/grants. Visit the MET area in NCTM Central to learn more.
Thursday Morning Sessions

8:00 a.m.–9:00 a.m.

3 Tools and Talk Moves for Rich Classroom Discussion

PreK–2 Session
Baltimore Convention Center, 303
How do we support children’s talk about their mathematical ideas with one another? In this session, we focus on tools and talk moves that are productive in supporting children’s talk. From the perspective of a second-grade classroom, we share what can help students engage in rich conversations about problem solving that supports their learning.

Sam Prough, University of Delaware, Elkton, Maryland
Kerry Haley, Forwood Elementary School, Wilmington, Delaware
Lynsey Gibbons, University of Delaware, Newark

4 I’m All Ears: Listening to Understand Student’s Ways of Thinking

3–5 Session
Baltimore Convention Center, 316
By presenting a task and leveraging it to elicit student conversations via clustered questioning, teachers can better understand how students are currently thinking about key ideas in mathematics. Learn how to guide instruction by using a progressive questioning strategy to elicit evidence of students’ ways of thinking about a topic or concept.

Desiree Spikings, NWEA, Simpsonville, South Carolina

5 Engaging with Social Justice Mathematics Modeling Lessons

6–8 Session
Baltimore Convention Center, 341–342
Social justice mathematics modeling lessons (SJMMs) can empower students to act as agents of change in their communities. Come and experience two SJMMs: predicting the treatment of LGBTQ+ students in schools and placing a grocery store in a healthy food priority area. Participants will analyze the lessons and sample student work.

Mark Heath, Baltimore County Public Schools, Cockeysville, Maryland
William Lynch, Parkville, Maryland
Jodie Wohlfort, Perry Hall, Maryland
Jean Ciscell, Towson University, Middle River, Maryland
Kimberly Corum, Towson University, Maryland

7 Developing a High School Math Intervention Program

8–10 Session
Baltimore Convention Center, 317
The speaker will discuss Tier I intervention strategies that all teachers can implement in their high school math classes to reach most students in the normal classroom setting. She will describe the process of identifying and working with intervention students, including goal setting and progress monitoring. She will speak about ideal push-in.

Kara Teehan, Middletown High School North Middletown
K12, New Jersey
Twitter: Kara Teehan

8 Gamification on GeoGebra to Ignite Students’ Engagement with the Mathematical Practices

8–10 Session
Baltimore Convention Center, 309
This session will explore effective gamification to increase student engagement without sacrificing content learning through digitally interactive open educational resources for grades 7–12. Participants will learn how to search, curate, and customize games in GeoGebra that can act as standalone activities or be incorporated into existing lessons.

Robert Pontecorvo, Consultant, Garden City, New York
Twitter: @PontecorvoRob

9 Invigorating High School Mathematics: Practical Guidance for Long Overdue Transformation

10–12 Session
Baltimore Convention Center, Ballroom 1
Today, it seems as if nearly everyone agrees that high school mathematics needs to change. For far too long, math has not worked for far too many students. This session will discuss realistic steps that the high school math community must take, including creating math pathways for high school students and changes in pedagogy and assessment.

Eric Milou, Rowan University, Sewell, New Jersey
Twitter: @drMi

10 Ignite Your Awareness: Integrating Social-Emotional and Academic Learning

11 Ignite Your Community: Partnering to Plan and Support Success for Students

12 Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom

13 Ignite Your Power: Lifting Up Each and Every Person

14 Ignite Student Learning: Capitalizing on the Formative Assessment Process
Thursday Morning Sessions 8:00 a.m.–9:00 a.m.

10 Learning and Growing Together: Best Practices for Developing the Teacher/Coach Relationship
   Coaches/Leaders/Teacher Educators Session
   Baltimore Convention Center, 318–321
   This presentation will discuss several coaching models to support a common language and effective relationship between math teachers and coaches, building a foundation focused on mathematics and addressing the needs of students. The presenters will share a real-life case study of the successes of common learning and collaboration.
   Joshua Sawyer, Elizabeth City-Pasquotank Public Schools, North Carolina
   Twitter: @mrsawyermath
   Erin Gray, Northeastern High School, Elizabeth City, North Carolina

11 Community Counts: Building and Maintaining Your Mathematics’ Community throughout the Year
   General Interest Session
   Baltimore Convention Center, 319–320
   Do your students see math class as a safe place to take risks and share their ideas? Join us as we discuss the importance of creating and maintaining a positive mathematics’ community where students are engaged and reflect on their learning. Big ideas such as math identity, team building, and affirmative language will be shared and discussed.
   Kendra Johnson, Howard County Public Schools Systems, Columbia, Maryland
   Twitter: @kjmath
   Cheryl Akers, Guilford Elementary School, Columbia, Maryland
   Candace Beasley, Howard County Public Schools Systems, Ellicott City, Maryland

12 Tik Tok—Making Learning Social
   General Interest Session
   Baltimore Convention Center, 331–332
   Tik Tok creates an opportunity to meet students where they are, in their own learning journey and on their phone! In this session, we will explore how teachers can use Tik Tok to extend their classroom by creating condensed versions of lessons, provide refreshers, or check for understanding.
   William Nolan, NWEA, Portland, Oregon
   Sarka Mraz, NWEA, Portland, Oregon

13 Using a “Hope Wheel” to Create Culturally Relevant Mathematics Tasks and Experiences
   General Interest Session
   Baltimore Convention Center, Ballroom 2
   The Hope Wheel was created to assist teachers in crafting lessons and experiences that engage students in responding to racial and social injustice and culturally relevant mathematics practices. In this session, we explore how teachers can reimagine mathematics practices as well as design task goals and culturally relevant mathematics tasks with this tool.
   Lou Matthews, Urban Teachers, Baltimore, Maryland
   Twitter: @loumathswlive

13.1 Characterizing Culturally Relevant Mathematics Teaching
   Research Session
   Baltimore Convention Center, 310
   The presenters will discuss a research project conducted with 32 participants to characterize culturally relevant mathematics teaching. The participants varied in their conceptions of culturally relevant pedagogy (CRP). After participating in several professional learning sessions, the teachers planned, taught and reported on their CR lesson.
   Shelly Jones, Central Connecticut State University, New Britain
   Twitter: @ShellyMJones1
   Courtney Warner, West Hartford Public Schools, Connecticut

13.2 Building Math Fluency Routine for Grades K-5
   3–5 Exhibitor Workshop
   Baltimore Convention Center, 336
   Build a math fluency routine that develops number sense and efficiency, flexibility, and accuracy with operations. We’ll experience how number strings and math talks can increase your students’ confidence in mathematics with hand2mind’s Daily Math Fluency program. A sample of program provided and enter to win a Daily Math Fluency kit.
   hand2mind, Inc., Vernon Hills, Illinois
### Thursday Morning Workshops

**8:00 a.m.–9:15 a.m.**

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<td>14</td>
<td>Building on Early Elementary Students' Strengths to Design Powerful</td>
<td>PreK–2 Workshop</td>
<td>Baltimore Convention Center, 308</td>
<td>Sara Kirschner, George Mason University, Arlington, Virginia</td>
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<td>Teachers of Mathematics, Reston, Virginia; George Mason</td>
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<td>University, Fairfax, Virginia</td>
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<td>Theresa Wills, George Mason University, Springfield, Virginia</td>
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<td>Maureen Vora, George Mason University, Fairfax, Virginia</td>
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<td>Kate Roscioli, Prince William County Schools, Bristow, Virginia</td>
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<td>15</td>
<td>Early Elementary Mathematics Lessons to Explore, Understand, and</td>
<td>PreK–2 Workshop</td>
<td>Baltimore Convention Center, 349–350</td>
<td>Courtney Koestler, Ohio University, Athens</td>
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<td>Respond to Social Injustice</td>
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<td>Tonya Bartell, Michigan State University, East Lansing</td>
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<td>16</td>
<td>The Joys of Making Sense of Number Sense: Co-Constructing Students’</td>
<td>PreK–2 Workshop</td>
<td>Baltimore Convention Center, 327</td>
<td>Maria Franshaw, UW-Parkside, Kenosha, Wisconsin</td>
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<td>Learning</td>
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<td>17</td>
<td>Fluency Isn’t 40 Problems</td>
<td>3–5 Workshop</td>
<td>Baltimore Convention Center, 307</td>
<td>John SanGiovanni, John SanGiovanni, Westminster, Maryland</td>
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<td>18</td>
<td>There Is So Much Out There: Selecting and Adapting Math Activities</td>
<td>3–5 Workshop</td>
<td>Baltimore Convention Center, 301–302</td>
<td>Lara Dick, Bucknell University, Lewisburg, Pennsylvania</td>
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<td>from Online Teacher Marketplaces</td>
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<td>Emily Shapiro, Caldwell-West Caldwell School District, New Jersey</td>
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<td>Meg MacNeille, Saint Charles, Illinois</td>
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<td>19</td>
<td>Tired of Scoring of Rubric-Worthy Problems? Make It a Classroom</td>
<td>6–8 Workshop</td>
<td>Baltimore Convention Center, 315</td>
<td>Jennifer Suh, University of Michigan, East Lansing</td>
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<td>Routine!</td>
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<td>Sara Kirschner, George Mason University, Arlington, Virginia</td>
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<td>Shelley Kriegler, Center for Mathematics and Teaching, Sherborn</td>
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<td>Cynthia Raff, Center for Mathematics and Teaching, Pasadena, California</td>
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<td>20</td>
<td>All Students Can Succeed: Make It Happen with Continuous Assessment</td>
<td>8–10 Workshop</td>
<td>Baltimore Convention Center, 314</td>
<td>Meg MacNeille, Saint Charles, Illinois</td>
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<td>and Purposeful Grouping</td>
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<td>Emily Shapiro, Caldwell-West Caldwell School District, New Jersey</td>
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**Assessment Process**

- **Ignite Your Power: Lifting Up Each and Every Person**
- **Ignite Your Awareness: Integrating Social-Emotional and Academic Learning**
- **Ignite Your Community: Partnering to Plan and Support Success for Students**
- **Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom**
- **Ignite Student Learning: Capitalizing on the Formative Assessment Process**
Thursday Morning Workshops

8:00 a.m.–9:15 a.m.

21 Bring Motion, Emotion, and a Little Commotion to Your Math Class
8–10 Workshop
Baltimore Convention Center, 347–348
Learn how to start a cognitive commotion to motivate students’ interest and effort. Experience lessons in which physical motion gets students’ bodies and brains moving. Unpack the essential role of emotion in learning math, and examine how to teach and assess in ways that recognize your students as humans whose ideas and emotions are always in motion.
Ralph Pantozzi, Kent Place School, Summit, New Jersey
Twitter: @mathillustrated
Cheryl Kaplun, Summit, New Jersey

22 Practical Differentiated Instruction through the Lens of Diverse Cognitive Processing Styles
8–10 Workshop
Baltimore Convention Center, 343–344
This hands-on workshop supports mathematics teachers’ understanding of the diverse cognitive processing styles that our students bring as assets to learning. Participants will experience four minimath lessons that highlight these processing preferences. Inclusive and practical strategies to broaden students’ engagement will be shared.
Darshan Jain, Adlai E. Stevenson HS, Lincolnshire, Illinois
Twitter: Darshan Jain
Andrea MacLennan, Lincolnshire, Illinois
Anna Renken, Lincolnshire, Illinois

23 Engaging Entrance Tickets and Exit Tickets with Desmos
10–12 Workshop
Baltimore Convention Center, 339–340
How can we leverage student reflection on their learning? How can we get all students to participate and see mistakes as part of the learning process? In this session you will see how this can be done with entrance and exit tickets with Desmos Activity Builder and you will have a chance to create your own entrance or exit ticket activity.
S Leigh Nataro, Moravian University, Bethlehem, Pennsylvania
Twitter: @mathteacher24

24 I Want to Use Social Justice Mathematics, but Where Do I Start? Two Teachers Share Their Journey
10–12 Workshop
Baltimore Convention Center, 322–323
In this interactive workshop, participants will engage with a Social Justice Mathematics task using Complex Instruction strategies. Two high school math teachers will share their journey learning to use such tasks and strategies. They will reflect on benefits and challenges and discuss their collaboration with a researcher/former math teacher.
Kari Kokka, University of Pittsburgh, Pennsylvania
Twitter: @karikokka
Katrina Mancuso, City Charter High School, Pittsburgh, Pennsylvania
Joseph Meyer, City Charter High School, Pittsburgh, Pennsylvania
Cara Haines, University of Nevada, Las Vegas

25 Empowering Mathematics Teachers with a Research-Based Self-Reflection Tool
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 324–326
This session will introduce the Reformed Teaching Observation Protocol enhanced with equity-based performance descriptors (RTOP-E) to facilitate discussions about effective mathematics teaching. Participants will examine lesson video clips and consider ways to use the RTOP-E for self-reflection and professional development.
Christopher Rakes, University of Maryland Baltimore County, Hanover
Michele Stites, University of Maryland Baltimore County

26 Learning Labs: How to Turn Your Math Classroom into a Site for Authentic PD!
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 337–338
A K–12 instructional technology coach and former high school mathematics teacher will share her experience in turning district classrooms into learning labs—spaces in which small groups of teachers engage authentic, real-time professional development—to model high-impact instructional strategies. Session participants will leave with a basic plan for creating their own learning labs.
Tracy Driehaus, Daniel Boone Area SD, Birdsboro, Pennsylvania
Twitter: @tracy_driehaus

Stop by NCTM Central to ask questions and learn about Mathematics Teacher: Learning and Teaching PK–12!
Thursday Morning Sessions

27. From Models to Meaning: Using Models to Make Sense of Addition and Subtraction Math Facts
   PreK–2 Session
   Baltimore Convention Center, 318–321
   How might student-created models help students make sense of addition and subtraction math facts? Explore ways to weave models into simple investigations, prompting students to construct, observe, discuss, and discover fact strategies and ultimately lead them to greater fact fluency.
   Susan O'Connell, Quality Teacher Development, Millersville, Maryland
   Twitter: @SueOConnellMath

28. Responsive Mathematics Classrooms: Building Community to Promote Engagement for All Students
   PreK–2 Session
   Baltimore Convention Center, 341–342
   Come learn how to create an engaged community of learners using Responsive Classroom-based mathematical practices. Responsive Classroom facilitates discourse using equitable classroom norms and routines. You will learn how to maximize student engagement with conceptually based mathematical learning goals grounded in Responsive Classroom norms.
   Sararose Lynch, Slippery Rock University, Pennsylvania
   Jeremy Lynch, Slippery Rock University, Pennsylvania

   3–5 Session
   Baltimore Convention Center, Ballroom 2
   Participants will engage in discussing the responsibilities of and advocacy, impact, and support for mathematics specialists. The recently released position statement by NCTM, NCSM, AMTE, and ASSM entitled “The Role of Elementary Mathematics Specialists in the Learning and Teaching of Mathematics” will be used to guide this interactive session.
   Lorie Huff, Fayetteville Public School District, Arkansas
   Twitter: @LorieHuff1
   Sandi Cooper, Baylor University, Waco, Texas
   Joleigh Honey, Utah State Board of Education/ASSM, Salt Lake City
   John SanGiovanni, John SanGiovanni, Westminster, Maryland
   Nicole Rigelman, The Math Learning Center, Portland, Oregon

31. Spot My Strengths and Watch Me Grow
   3–5 Session
   Baltimore Convention Center, Ballroom 1
   Break barriers and shift from only identifying student gaps by first identifying student strengths. Identifying student strengths takes “knowing your learner” to another level. Improve instructional decision making by learning how to use varied tools to spot and leverage student strengths to build confidence and develop a community of learners.
   Asha Johnson, Howard County Public Schools, Columbia, Maryland
   Kristen Mangus, Howard County Public School System, Crownsville, Maryland

32. Fostering Student Agency with Assessments
   6–8 Session
   Baltimore Convention Center, 309
   How can we ensure assessments are not a termination but an extension of students’ learning? Join us as we discuss how to leverage assessments to understand students’ thinking, inform instruction, and promote student agency—more important than ever as we work to catch students up and move them forward in their learning.
   C. Kyle Falting, Zearn, New York, New York
   Stephanie Ely, Zearn, New York, New York

33. Building Relationship Skills to Enhance Students’ Sense of Belonging in the Classroom
   8–10 Session
   Baltimore Convention Center, 310
   Students’ feeling of connectedness has a critical impact on their academic engagement, motivation, and performance. Explore ways to explicitly and repeatedly engage students in activities that promote the development of relationship skills in order to improve students’ sense of belonging in the math classroom.
   Sydney Hendricks, Stevenson High School, Wheeling, Illinois
   Twitter: Sydney Hendricks
   Mary Smaga, Lincolnshire, Illinois

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
Thursday Morning Sessions

34 Advanced Algebra with Financial Applications: A Third- and Fourth-Year Alternative for Struggling Students
10–12 Session
Baltimore Convention Center, 303
For students who need three or four years of math to graduate, algebra 2 and precalculus are often daunting options. Advanced Algebra with Financial Applications is an engaging course that uses selected topics from algebra 2, geometry, trigonometry, precalculus, probability/statistics, and more to cover banking, credit, insurance, income tax, investing, employment, and more.
Robert Gerver, Institute for Creative Problem Solving, Kings Park, New York

35 Data and Data Science: Core and Beyond
10–12 Session
Baltimore Convention Center, 319–320
Students often see mathematics as abstract and unrelated. Data science and real data can motivate students to investigate mathematical relationships involved in contexts like herd immunity, gender wage gap, or changing levels of CO2 in the atmosphere. Let’s engage all students in the joy of mathematics, connecting it to the world in which they live.
Gail Burrill, Michigan State University, Hales Corners, Wisconsin

36 “Who Really Invented Math?”: Incorporating an Inclusive Math History into Your Lessons
General Interest Session
Baltimore Convention Center, 316
Building math identity is an integral part of teaching mathematics to all of our students. When we omit stories of ancestral roots in our current math practices, we are affecting our students’ math identities. This session will discuss how to integrate a full math history into our curriculum to make math more culturally sustaining.
Nancy Buck, The Boerum Hill School for International Studies, Long Island City, New York
Twitter: ms_buck2011
Najla Purdy, Brooklyn, New York

37 Leveraging Technology to Promote the Equitable Mathematics Practices
General Interest Session
Baltimore Convention Center, 317
The EqTtech Lesson Analysis Tool provides a rubric for analyzing technology-integrated lessons and evaluating them on the basis of five dimensions of equitable use of technology in the classroom. In this session, participants will explore the tool and analyze a technology-enhanced lesson.
Kate Roscioli, Prince William County Schools, Bristow, Virginia
Twitter: @MrsRoscioli
Jennifer Suh, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; George Mason University, Fairfax, Virginia

37.1 I Gotta Do This With My Kids!
8–10 Exhibitor Workshop
Baltimore Convention Center, 336
Check out the powerful ways students can be engaged using TI-84 Plus CE graphing technology as an exploration tool. We will explore many ideas for using graphing technology as a tool for exploring concepts that are tough to teach and tough to learn. Come learn some new strategies for incorporating graphing technology into your classroom.
Texas Instruments, Sacshe, Texas

37.2 Ratios, Rates, and Percents, Oh My!
6–8 Exhibitor Workshop
Baltimore Convention Center, 345 - 346
The study of ratios and proportional relationships begins in the 6th grade and is an integral foundation for the study of functions, which continues through high school and beyond. In this hands-on inquiry-based session, participants will build a personal toolbox of effective problem-solving strategies that address ratio reasoning.
STEMscopes by Accelerate Learning, Houston, Texas
Thursday Morning Workshops

9:45 a.m.–11:00 a.m.

38  Math Running Records: The GPS of Fact Fluency
PreK–2 Workshop
Baltimore Convention Center, 349–350
In this interactive session, Dr. Nicki will present the framework, show videos, and have participants learn how to administer a Math Running Record. We will discuss the why, what, how, and when of a Math Running Record. Participants will learn how to get and use actionable math fluency data to improve student achievement. Come learn more today!
Nicki Newton, Newton Education Solutions, Bridgeport, Connecticut
Twitter: Dr. Nicki Newton

39  Teaching Algebraic Thinking and Problem Solving without the X’s
PreK–2 Workshop
Baltimore Convention Center, 322–323
Strategies to develop algebraic thinking, including use of the equal sign, other representations, patterns, and solving for unknowns, will be the focus for this hands-on workshop. Attendees will be actively engaged with manipulatives, effective questioning strategies, and the exploration of real-life problems that promote algebraic thinking.
Donna Knoell, Self, Shawnee Mission, Kansas

40  Developing a Problem-Solving Culture in the Elementary Grades
3–5 Workshop
Baltimore Convention Center, 339–340
Developing a problem-solving culture requires a combination of selecting challenging yet accessible problems and making appropriate instructional moves. We’ll investigate problems that instigate mathematical excitement in the elementary grades. Come have some fun and find out what role you can play.
Patrick Vennebush, The Math Learning Center, Portland, Oregon
Twitter: pvennebush

41  Formative Assessment: Guiding, Informing, and Impacting Teaching and Learning—You’ve Got This
3–5 Workshop
Baltimore Convention Center, 308
Participants will be engaged in discussing the implementation of classroom-based formative assessment techniques, including observations, interviews, show me, hinge questions, and exit tasks. They will also discuss the link between formative assessment and feedback, including teacher-to-student, student-to-teacher, and student-to-student feedback.
Francis (Skip) Fennell, McDaniel College, Westminster, Maryland
Twitter: @SkipFennell
Beth Kobett, Stevenson University, Maryland
Jon Wray, Howard County (MD) Public School System, Ellicott City, Maryland

42  Impacting Learning through Puzzles and Play
3–5 Workshop
Baltimore Convention Center, 324–326
Learn how the impact of puzzles and play leads to a healthy relationship with mathematics, creating confident and joyful mathematicians! Albert Einstein described play as “the highest form of research.” In this workshop, you will explore the research, you will experience joyful mathematics, and you will leave with resources for immediate use.
Susan Looney, Looney Math Consulting, North Easton, Massachusetts
Twitter: @looneymath

43  NASA’s Solar System Scale of Discovery: Life Applications for Ratios, Fractions, and Scale
6–8 Workshop
Baltimore Convention Center, 315
Come create a solar system pocket scroll based on the ratios of our solar system. Explore applications of fractions, conversions, and scale with hands-on, standards-aligned NASA STEM activities. Engage our universe as you apply scale to distance, time, size, and models. Apply fractions related to our solar system within the classroom and beyond.
Barbara Buckner, NASA Goddard Space Flight Center, Laurel, Maryland
Twitter: @bbuckner

44  STEM in the Elementary and Middle School Classroom: Increase Student Engagement in Mathematics
6–8 Workshop
Baltimore Convention Center, 343–344
Problem-based STEM learning activities provide connections between math and science classroom content and real-world application. Providing students with STEM learning activities allows students to engage in challenging math content to solve real-world problems. Hands-on STEM activities provide opportunities for all students to contribute.
Leslie Sauder, Hamlin School District, Hayti, South Dakota

NCTM Regional Conference & Exposition  •  Baltimore • November 30 – December 2, 2022
Thursday Morning Workshops

9:45 a.m.–11:00 a.m.

45 Proactively Responding to Data to Develop Student Understanding
8–10 Workshop
Baltimore Convention Center, 327
Participants will discuss in-the-moment teacher moves to revise student thinking. Participants will work in groups to analyze sample student work to brainstorm next steps for what and how to reteach, and with whom (i.e., whole class, small groups, individuals), after collecting data from various types of formative assessment.
Stephanie Miller, Sumner County Schools, Gallatin, Tennessee
Twitter: @smiller_educ8or
Whitney Goostree, Sumner County Schools, Gallatin, Tennessee

46 Ohio’s Mathematical Modeling and Reasoning Course: Putting Math in the Hands of Every Student
10–12 Workshop
Baltimore Convention Center, 337–338
Ohio has been working diligently to create an algebra 2 equivalent curriculum that focuses on learning through modeling and inquiry. Join teachers who helped write the course as they lead participants through activities from the content themes of the course and possible assessment strategies. Leave with new ideas for any high school class!
Rachael Gorsuch, Columbus Academy, Gahanna, Ohio
Twitter: @rachaelhgorsuch
Jennifer Walls, Firestone High School, Akron, Ohio

47 Strategies to Integrate Social-Emotional Learning Competencies into Secondary Mathematics Instruction
10–12 Workshop
Baltimore Convention Center, 301–302
Supporting the social and emotional needs of diverse learners has become an emergent concern across K–12 schools. Yet, educators remain oblivious about the optimum approach to infusing social-emotional learning into content area instruction. This workshop seeks to engage math teachers in pragmatic strategies for infusing the CASEL competencies into secondary math.
Abimbola Akintounde, Montgomery County Public Schools, Rockville, Maryland

48 Putting Student Knowledge to Work: Using an Assets-Based Approach to Drive Instructional Decisions
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 347–348
How does knowing what students know instead of what they don’t know reshape instruction? This session will model using an asset-based approach to formative practices to provide deep insight into students’ mathematical thinking and explore how to connect rich mathematical tasks to students’ understanding, experiences, and funds of knowledge.
Mary Resanovich, NWEA, New City, New York

49 Strategies for a More Humane, Student-Centered Approach to Assessment
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 307
Assessments often have a deficit lens, focusing on what students don’t know. An asset lens is more humane, focusing on what students do know and what they need to learn next. Learn three research-informed shifts to your daily routine that can make assessment less stressful, more student-centered, and more informative.
Kimberly Morrow Leong, The Math Learning Center, Fairfax, Virginia
Twitter: @kmorrowleong

50 New and Preservice Teachers’ Workshop
General Interest Workshop
Baltimore Convention Center, 314
Find answers to your questions on topics such as classroom management, parents, motivation, and keeping your sanity. Connect with other new teachers, learn from experienced professionals, and find resources to engage you and your students. You might even win a prize!
David Barnes, National Council of Teachers of Mathematics, Reston, Virginia
Twitter: @DavidBarnes360

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
The Intersection of Language and Mathematics: Accessibility for All
PreK–2 Session
Baltimore Convention Center, 316
When a student struggles with math, is it the mathematics or something else? We will look at the ways language interacts with math teaching and learning. We’ll explore how language challenges can interfere with students’ grasp of ideas and how facility with language can mask students’ misconceptions. Planning and intervention strategies included!
Karen Rothschild, Bank Street College of Education, New York, New York
Matthew McLeod, EDC, Inc., Chicago, Illinois
Charlene Marchese, Bank Street College of Education, New York, New York

Why Math Games Are Good for Your Students and How to Play Them
3–5 Session
Baltimore Convention Center, 319–320
Do you know the most effective ways to use math games in your classroom? Are your students not on task when playing math games? Are they not being held accountable? Or are they just too loud? Let me show you how to fix all of these things! Join me for an interactive learning experience that will change the way you play math games forever!
Maria Merrill, Howard County Public Schools, Laurel, Maryland
Twitter: Maria Merrill

Math Solver Apps: A Teacher’s Friend or Foe?
6–8 Session
Baltimore Convention Center, 341–342
The digital age has brought artificial-intelligence–powered math solvers to our students. Is this a way of cheating on homework and tests or an important support tool for remote schooling? In this session, we will explore how these math apps can help teachers examine how they assess and attend to teaching the full breadth of the standards.
William Nolan, NWEA, Middle Grove, New York
Sarka Mraz, NWEA, Austin, Texas

Striking a Balance: Integrating Concepts and Procedures
6–8 Session
Baltimore Convention Center, Ballroom 1
Math educators have been tasked with increasing a focus on building conceptual understanding of mathematical ideas while decreasing the focus on procedures that lead to answers without understanding. How can we find the balance in integrating concepts and procedures for deeper understanding? Explore the balance in this hands-on experience.
Joanie Funderburk, Texas Instruments, Parker, Colorado
Twitter: @JoanieFun
Curtis Brown, Texas Instruments, Dallas

What’s the “Meme-ing” of Mathematics?
6–8 Session
Baltimore Convention Center, 317
Mathematics space is anxiety inducing for many. We have a long history of lecture, individual work, pages of problems, and exams, but we know student discussion within the class is beneficial. So what if–
This session explores how math memes be used, productively, to help change students’ perception of the discipline
Gregory Beaudine, University of Iowa, Iowa City
Twitter: theGreatsOfMath

Yes, You Can Teach Calculus in Algebra! Comparing Linear, Exponential, and Quadratic Functions
8–10 Session
Baltimore Convention Center, 318–321
Participants will learn how to collect, plot, and model data from linear, exponential, and quadratic functions kinesthetically and with technology. Connections among multiple representations of these functions will lead to interesting discoveries and a deeper understanding of each functions’ key characteristics that bring calculus into algebra.
Robin Gapinski, Highland Park High School, Illinois
Twitter: @gapinski2

Get social! Stay informed and get connected with attendees by following #NCTMBALT22 on social media.
Thursday Morning Sessions

58  Is There a “Recipe for Learning Math?”
10–12 Session
Baltimore Convention Center, 310
Math is not a series of problems types, each with a “recipe” or algorithm to get an answer. Conceptual understanding is key! And yet, good teaching has important “ingredients,” including reading, writing, and relationships. We’ll talk mostly about ways to increase student agency and self-confidence through reflective and analytical writing.

Brent Ferguson, Princeton Day School, New Jersey
Twitter: @BAFerg

59  Strategies to Promote Joy and Cultivate Curiosity in High School Mathematics
10–12 Session
Baltimore Convention Center, 309
Students who are curious about mathematics are more likely to persevere. Unfortunately, by the time students reach high school, the mathematical curiosity of many students is diminished. In this session, we share how we infused curiosity-provoking strategies into algebra 2 instruction, resulting in heightened student engagement.

Christy Graybeal, Hood College, Frederick, Maryland
Karine Ptak, Frederick, Maryland

60  Increasing Desmos Love in Your Mathematics Community
Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 331–332
Do you love Desmos? Would you like teachers to bring the full, transformational potential of Desmos to their classrooms? Presenters and participants will share their experience coaching Desmos implementation; participants will walk away with strategies to spread Desmos love to their teachers while avoiding common pitfalls of technology integration.

Christopher Wright, Baltimore County Public Schools, Towson, Maryland
Twitter: @cwright4math
Brett Parker, Baltimore County Public Schools, Towson, Maryland

61  President Address: Honoring the Voices of Our Students to Spark Passion
General Interest Session
Baltimore Convention Center, Ballroom 2
Too many times and for too long, we have seen that not every student experiences success in mathematics. What can we do to see and hear our students to help spark their math passion? Let’s examine some teaching practices that help nurture students’ positive mathematical identities and promote deep understanding of concepts.

Kevin Dykema, President, National Council of Teachers of Mathematics, Reston, Virginia; Mattawan Middle School, Michigan

61.1  An All-Access Pass to Meaningful Math
Coaches/Leaders/Teacher Educators Exhibitor Workshop
Baltimore Convention Center, 345 - 346
Utilizing rich open tasks that allow for equitable engagement does not need to be intimidating. This session will support the active equity and engagement of all students by working with low floor, high ceiling activities that allow for meaningful mathematical involvement. Presenter: Raul Gonzalez, Savvas Learning Co.
Savvas Learning Company, Paramus, New Jersey

61.2  Solving2Succeeding: Building Problem Solvers for Tomorrow (Grades K-5)
3–5 Exhibitor Workshop
Baltimore Convention Center, 336
Focus on building students’ problem solving and critical thinking skills with a progressing series of problems aligned to key math skills that allows students to successfully solve and understand multistep problems in any situation! Example lesson provided and enter to win a grade level of your choice Hands-On Standards Daily Problem Solving Kit. Exhibitor Workshop
hand2mind, Inc., Vernon Hills, Illinois

61.3  The Mathspace Learning Ecosystem—Check, Teach and Learn
6–8 Exhibitor Workshop
Baltimore Convention Center, 328
Our vision at Mathspace is to be an all-in-one resource that helps teachers teach and students become thinkers and doers of mathematics. Whether you use Mathspace right now or want to hear more, join our workshop to learn more about how to implement this powerful tool in 3 quick steps.
Mathspace, New York, New York
Who Is a Mathematical Thinker? Identity, Math, and Story Telling
PreK–2 Burst
Baltimore Convention Center, 327
Picture books can help all children see themselves as mathematical thinkers. We discuss how story time supports positive math identities and math learning for young children. We examine picture books using elements critical for all students’ learning: diverse characters, relevant stories, and deep mathematics themes. Specific books will be shared.
Delayne Johnson, Delaware State University, Smyrna

Have a Seat in the Equation Cafe: The Menu-Writing Project
3–5 Burst
Baltimore Convention Center, 349–350
The NCTM MTLT journal article (May 2022) “Have a Seat in the Equation Cafe” presents an innovative idea for building on students’ lived experiences to create engaging and motivating mathematics. The author will be sharing highlights of her article, implementation strategies for grades 4–7 and ideas for differentiating instruction.
Sandy Vorensky, Metuchen School District, New Jersey

Differentiated Gradual Release Toward Independent Success for Everyone
6–8 Burst
Baltimore Convention Center, 301–302
We want all students to succeed independently by the end of each math lesson. However, they need varying degrees of extra help to get there. This session simulates a guided practice session with successive rounds of dry-erase formative assessment to differentiate the speed of gradual release and maximize the impact of teacher interactions.
Josh Britton, Get More Math, Quarryville, Pennsylvania
Twitter: @mr_GetMoreMath

How Writing Routines Can Actually Help Students Feel More Like Mathematicians
6–8 Burst
Baltimore Convention Center, 339–340
As a math and ELA teacher at the middle school level, I notice a strong connection between the work of a mathematician and the work of a writer. My presentation is based on my teaching practices that connect the writing process (thinking, revising, clarifying ideas) to strengthen students’ learning of mathematics.
Nate Larlee, Edna Drinkwater School, Northport, Maine
Twitter: @natelarlee

Getting the Most out of Every Task
8–10 Burst
Baltimore Convention Center, 324–326
Each task presents us with new opportunities to engage students and deepen their understanding. In this session participants will learn strategies for extending tasks before, during, and after students engage with them. Participants will have the opportunity to experience the strategies as learners and then consider ways to enact them as teachers.
Zandra de Araujo, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Florida, Gainesville
Twitter: @zdearaujo

Proving the Formulas for the Volume and Surface Area of a Sphere
8–10 Burst
Baltimore Convention Center, 314
This presentation includes proofs for the formulas for the volume and surface area of a sphere that are appropriate for high school geometry. We will give (1) a proof of the volume formula in the standard way, (2) a relationship between the surface area and volume, and (3) an independent proof of the surface area, which is less well-known.
William Rose, Montgomery Blair High School, Silver Spring, Maryland
Twitter: @dodecahedra

Creating Community in the Secondary Mathematics Setting
Coaches/Leaders/Teacher Educators Burst
Baltimore Convention Center, 343–344
To foster community in the absence of common curriculum and planning, a district-wide, secondary mathematics professional learning community was established to shift the mindset around math instruction through vertical alignment by unpacking standards, creating and analyzing common assessments, and utilizing demonstration classrooms.
Stephanie Miller, Sumner County Schools, Gallatin, Tennessee
Twitter: @smiller_educ8or
Whitney Goostree, Sumner County Schools, Gallatin, Tennessee

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
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<tr>
<th>Session Number</th>
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<td>69</td>
<td>Using the Eight Math Practices to Lead Teacher Math Meetings</td>
<td>Burkett</td>
<td>Baltimore Convention Center, 315</td>
<td>The eight Common Core State Standards for Mathematical Practice are essential to developing students who know, understand, and appreciate math. The same eight practices apply to teacher meetings when math is the topic at hand. For example, &quot;Making sense of problems and persevering in solving them&quot; is SMP 1, but is also a mindset when discussing math in grade-level meetings. Kristin Rice, Granby Public Schools, North Granby, Connecticut Twitter: Kristin L Rice Kathryn Busbey, Granby Public Schools, Connecticut</td>
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<td>70</td>
<td>Vertical Math Team: Looking at Math Instruction through a Progressive Lens</td>
<td>Burkett</td>
<td>Baltimore Convention Center, 307</td>
<td>Math coaches and administrators from the West Shore School District will discuss their vertical math team. Discussion will include framework, common goals, language, problem-solving organizers, aligning materials, and shared resources to ensure unified and equitable math instruction through the grade levels. Daniel Grejda, West Shore School District, New Cumberland, Pennsylvania Allison Freeman, West Shore School District, New Cumberland, Pennsylvania Dean Reed, West Shore School District, New Cumberland, Pennsylvania Brian Granger, West Shore School District, New Cumberland, Pennsylvania</td>
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<td>71</td>
<td>Advocates for Meaningful Change: Making High-Quality, Equitable Mathematics for All a Reality</td>
<td>Burkett</td>
<td>Baltimore Convention Center, 337–338</td>
<td>Are the vision for and the reality of your math programs aligned? This session will present big ideas that are imperative for moving the reality of your program closer to your vision. Come collaborate with your colleagues around how to effectively advocate for and expect high-quality, equitable mathematics learning for every student in your system. Katey Arrington, University of Texas at Austin Twitter: @ArringtonKatey</td>
</tr>
<tr>
<td>72</td>
<td>Banding Together: Looking at Math Class as Rehearsal, Not Performance</td>
<td>General Interest</td>
<td>Baltimore Convention Center, 308</td>
<td>Have you ever heard a school band play a piece for the first time? It’s terrible. But at the concert it’s so much better! Why? Because band rehearsal is daily, ongoing formative assessment, incremental change, and active learning. This session will share how to create that environment in your math class. Bring your band instrument. We’ll play too! Denis Sheeran, Montclair State University, New Jersey Twitter: @MathDenisNJ</td>
</tr>
<tr>
<td>73</td>
<td>Social Justice + Mathematics = Mathematics That Is (Meaningful + Memorable)</td>
<td>General Interest</td>
<td>Baltimore Convention Center, 322–323</td>
<td>When social justice lessons are brought into a mathematics classroom as a regular feature, conversations around social justice become a regular feature too. Such themed lessons are adaptable, are relevant to students and their life, and are richer and open to depth in content and cross-curricular learning. Sandhya Raman, Berryessa Union School District, Milpitas, California Twitter: @sandyraman</td>
</tr>
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<td>74</td>
<td>Igniting Awareness of Fairness: Selecting Sustainable, Nonexploitative, and Inclusive Word Problems</td>
<td>Research</td>
<td>Baltimore Convention Center, 347–348</td>
<td>Attendees will have the opportunity to examine teacher-constructed and readily available word problems. Using a critical lens, they will identify how these problems might unconsciously promote consumerism and harmful environmental practices as well as reinforce stereotypes and inequity by highlighting privileges. Discussion for revision ensues. Joanne Baltazar Vakil, The Ohio State University, Columbus Twitter: Joanne Baltazar Vakil</td>
</tr>
</tbody>
</table>
In Their Own Words: Getting the Most out of the Lesson Objective

**PreK–2 Session**
Baltimore Convention Center, 309

“Today we are going to learn about …” Isn’t that how most lessons begin? Let’s shift the paradigm to refrain from announcing the objective and instead close with a “Math Meeting” during which students debrief the lesson experience. The result is reflective students arriving at an authentic understanding of concepts expressed in their own words.

Melanie Gutierrez, Great Minds, Washington, District of Columbia

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Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades

**3–5 Session**
Baltimore Convention Center, 319–320

Explore the research-informed recommendations of the What Works Clearinghouse Practice Guide on Assisting Students Struggling with Mathematics: Intervention in the Elementary Grades. This session will examine the importance of using precise mathematical language, multiple representations, and a structured approach to teaching word problems.

Karen Karp, Johns Hopkins University, Baltimore, Maryland
Twitter: @ksquaredmath1

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Creating Sense-Making Classrooms

**3–5 Session**
Baltimore Convention Center, Ballroom 2

In a world where we have constant access to information and calculators, cultivating skills like critical thinking, communication, and problem solving is more important than ever. Luckily, these skills are natural and very possible for all students. This presentation will show you how to build a sense-making classroom with independent thinkers.

Aubree Gibson, Putnam City Schools, Oklahoma City, Oklahoma
Twitter: Aubree Hurt

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Making Math a Festival: How to Build Joyful Math Communities in Your Classroom and Beyond

**3–5 Session**
Baltimore Convention Center, 341–342

What does joyful math look like? What if I don’t have the time or resources for it? Join us and engage in some of our favorite low-floor/high-ceiling math problems and learn how you can use them effectively in your own classroom. All our resources are free, and we’re here to support you in connecting students to joyful math experiences.

Annette Rouleau, Julia Robinson Mathematics Festival, Calabasas, California
Twitter: @annetterouleau
Daniel Kline, Julia Robinson Mathematics Festival, San Jose, California

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Enhance Formative Assessment by Tech-Powered, Data-Driven Instruction

**6–8 Session**
Baltimore Convention Center, 316

Data helps teachers implement formative assessments to improve student outcomes. But gathering data and developing next steps that support all students on a regular basis can be overwhelming for teachers. In this session, learn how ASSISTments, a free formative tool, saves you time and helps you better meet the needs of all students.

Carrie Moy, ASSISTments Foundation, Chicago, Illinois
Cristina Heffernan, ASSISTments Foundation, Auburn, Massachusetts

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Increasing Student Voice and Choice—Without Losing Your Mathematical Mind!

**6–8 Session**
Baltimore Convention Center, 310

In many math classrooms, teachers want to increase their students’ voice and choice but don’t know how. This workshop focuses on steps and techniques teachers can immediately use to help create a student-centered classroom that engages in meaningful learning in a diverse and supportive environment while still maintaining appropriate rigor.

Laura Bamberger, Volusia County Schools, Ormond Beach, Florida

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Humanizing Mathematics Educational Practices for and with Disabled Students of Color

**8–10 Session**
Baltimore Convention Center, 329

The complexities of teachers’ and students’ multiple marginalized identities require humanizing IEP practices that remain rooted in White supremacy and ableism. In this presentation, we share innovative approaches that teachers of mathematics used to create justice-oriented IEPs for and with their disabled students of color.

Paulo Tan, Johns Hopkins University, Baltimore, Maryland
Twitter: Paulo Tan
Alexis Martineau, Francisco Medrano Middle School, Dallas, Texas
Ajaysie Gipson, Cesar Chavez Learning Center, Dallas, Texas
Daviona Sims, Uplift Wisdom, Dallas, Texas
Cyera Taylor, Uplift Atlas Preparatory, Dallas, Texas

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**Thursday Afternoon Sessions**

1:00 p.m.–2:00 p.m.

**Ignite Your Awareness:** Integrating Social-Emotional and Academic Learning

**Ignite Your Community:** Partnering to Plan and Support Success for Students

**Ignite Students’ Engagement with the Mathematical Practices:** Promoting Joy in the Classroom

**Ignite Your Power:** Lifting Up Each and Every Person

**Ignite Student Learning:** Capitalizing on the Formative Assessment Process
Thursday Afternoon Sessions

83 Real-World Algebra: An “Application-First” Curriculum
10–12 Session
Baltimore Convention Center, 318–321
When is algebra used in real-life?!? Attend this workshop and never hear that question again! Our students are coming to our class excited, and they are leaving (at least a little more) ready for the world after high school! Learn real-life applications that include but are not limited to exponential functions, quadratics, rational functions, and more.

Justin Cotter, Assabet Valley Regional Technical High School, Marlborough, Massachusetts

84 Growing Fact Strategies into General Reasoning Strategies to Ignite Student Sense Making and Fluency
General Interest Session
Baltimore Convention Center, Ballroom 1
Teaching strategies (e.g., making 10) is not only effective for learning basic facts, it sets students up for success in learning significant strategies for whole numbers, fractions, decimals, integers, and algebra. Through activities, games, and routines, I share how to “grow” reasoning strategies, fostering student mathematics identity and agency.

Jennifer Bay-Williams, University of Louisville, Kentucky
Twitter: @JBayWilliams

85 Leveraging Equity: Creating a Legacy for All Learners
Research Session
Baltimore Convention Center, 317
Mathematics has a legacy that has inspired many aspects of human innovation throughout all of time. Yet, many students struggle with building positive mathematics identities and taking their place in this legacy. Come discover strategies to support you in designing mathematics experiences that promote agency, equity and student voice.

Kelsey Skaggs, MIND Research Institute, Irvine, California
Twana Young, MIND Research Institute, Irvine, California

85.1 Building A Math Fluency Routine for Grades 6–8
6–8 Exhibitor Workshop
Baltimore Convention Center, 336
How can you build a math fluency routine that develops number sense and efficiency, flexibility, and accuracy? We’ll experience how number strings and math talks can increase your students’ confidence in mathematics with hand2mind’s Daily Math Fluency program. A sample of program is provided and enter to win a grade level Daily Math Fluency Kit.
hand2mind, Inc., Vernon Hills, Illinois

STUDENTS DON’T HATE MATH.
THEY HATE BEING FRUSTRATED.

Knowre Math is a 1st–12th grade online math program, designed to meet students where they are in their learning. Knowre’s unique scaffolded Walk Me Through help is modeled after the one-on-one interactive support students experience with teachers.

Visit www.knowre.com to learn more.
Thursday Afternoon Workshops

1:00 p.m.–2:15 p.m.

86  Collaboration, Community, and the Joy of Exploring Math
    PreK–2 Workshop
    Baltimore Convention Center, 322–323
    How might we plan lessons that foster a sense of collaboration and community? Join us to learn about and experience lessons connected to our community. Through contexts in baseball, football, science, and The Nutcracker, students and teachers solved tasks connected to the math and practice standards. We will leave with a collaborative idea document.
    **Rebecca Holden**, Trinity School, Atlanta, Georgia
    Twitter: @bholden86

87  If You Build It, They Will Come: Purposeful Integration of Mathematics within STEM
    PreK–2 Workshop
    Baltimore Convention Center, 327
    This session presents strategies to enhance children’s engineering activity through explicit math instruction, which occurs in both teacher-directed and child-initiated (e.g., play) contexts. Participants will unpack the knowledge and skills related to number, geometry, measurement, and algebra that occur authentically as children engage in STEM.
    **Brian Mowry**, Frog Street Press, Austin, Texas
    Twitter: Brian Nelson Mowry

88  Formative Assessment: Student Thinking as the Input for Adapting Instruction
    3–5 Workshop
    Baltimore Convention Center, 339–340
    To support all students within grade-level mathematics, we must move away from the failed system of remediation based on small, disconnected pieces of evidence and move toward an asset-based approach based on meaningful formative assessment. Come learn actionable instructional strategies that build on and connect to students’ current thinking.
    **Kristin Gray**, Amplify, Lewes, Delaware
    Twitter: kristin gray

89  Rethinking Preassessments: Gathering Data with Equity in Mind
    3–5 Workshop
    Baltimore Convention Center, 308
    All students are capable of mathematical thinking—yet traditional preassessments usually focus on what students don’t know. Let’s rethink these practices. Together, we will explore formative assessment strategies that honor student thinking, foster student identity, and support equity-based instructional decision-making.
    **Jenna Laib**, Brookline Public Schools, Medford, Massachusetts
    Twitter: @jennalaib

90  How Might We Rethink Intervention?
    6–8 Workshop
    Baltimore Convention Center, 314
    Do you have students who struggle and need intervention? What is the answer? Preteach? Vocab drill? More practice? Attend to experience intervention redesigned: a course focusing on relationships, problem solving, and enjoying mathematics. Experience activities to support students as they rebuild their mathematical identity.
    **Karen Wootton**, CPM Educational Program, Odenton, Maryland

91  Positive or Negative? Strategies for Teaching Integers in Grades 6–8
    6–8 Workshop
    Baltimore Convention Center, 314
    Why are integers so hard for students? In this workshop, we will explore concrete ways to provide students with conceptual learning. Participants will experience hands-on activities for introducing integers to students and leave with resources and routines for their classrooms.
    **Heidi Sabnani**, Self-Employed, Foxboro, Massachusetts
    Twitter: @hlsabnani
    **Molly Vokey**, Mansfield, Massachusetts

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Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
Your Mission, Should You Choose to Accept it, Is to Break Out!

6–8 Workshop
Baltimore Convention Center, 324–326
Looking for something that will spark excitement in your middle school math classroom? Come and find out how a breakout experience might be just what you need. Work collaboratively to discover clues and solve puzzles. See if your team can open all the locks before time runs out!

Ming Tomayko, Towson University, Maryland
Twitter: @ming_tomayko

Exploring the Linear Relationship Between Celsius and Fahrenheit Degrees and Modeling with Technology

8–10 Workshop
Baltimore Convention Center, 343–344
Using the paper-folding method, participants will explore different ordered (Celsius, Fahrenheit) pairs at different temperatures. Later, we will model the ordered pairs in an algebraic equation using dynamic geometry software, GeoGebra and Desmos. Participants will have opportunities to explore mathematical ideas in conjunction with STEM.

Deependra Budhathoki, Ohio University, Athens
Twitter: kaishko
Bhesh Mainali, Rider University Lawerencenville NJ, Morrisiville, Pennsylvania


8–10 Workshop
Baltimore Convention Center, 315
How does math make sense of a chaotic world? An exploration of how fractals are everywhere and can stimulate student-centered conversation. The goal is to inspire students to view nature, music, and art through the lens of mathematics. The workshop includes some activities and as much or as little math as you want to use, based on the level of your students.

Peggy Beauregard, University of Hartford, West Hartford, Connecticut

Creating Intellectual Engagement and Intellectual Need: A Conceptual Foundation for Dilation

10–12 Workshop
Baltimore Convention Center, 337–338
Engage in a fun, hands-on geometry task about dilations. The low-threshold, high-ceiling nature of the task will promote access for all learners and also facilitate new levels of understanding. The thinking of the learners will be leveraged to foster meaningful collaboration, new learning, and mathematical connections. Five Practices will be modeled.

Travis Lemon, Alpine School District, Lehi, Utah
Twitter: @TravisLemon

Connecting Culture, Curriculum, and Mathematics

Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 337–338
Every child brings into the educational environment their own culture. However, oftentimes their cultures are dismissed consciously and unconsciously. Therefore, it is time to provide educators with tools and strategies to connect culture, curriculum, and mathematics to ensure every child has a high-quality classroom mathematics experience.

Kristopher Childs, K Childs Solutions, Windermere, Florida
Twitter: @DrKChilds
Georgina Rivera, Bristol Public Schools, West Hartford, Connecticut

Starting a Movement: Start with the Crown, Not the Kid

Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 307
Great teachers hold above the head of their students, a crown they challenge them to grow tall enough to wear. Engaging collaborative teams is a powerful combination of mindset and practice that should be embedded in the DNA of every school’s culture. In Start with the Crown, Ken Williams makes clear what instructional equity looks like in practice.

Ken Williams, Unfold The Soul, Inc., Sharpsburg, Georgia
Thursday Afternoon Sessions

**99** Dominoes, Towers, and Starfish: How Mathematically Challenging Tasks Affected One Elementary Classroom

3–5 Session
Baltimore Convention Center, 303

This interactive workshop is based on research findings from a pilot study in which elementary students engaged in challenging mathematical tasks. Participants will aim to solve three of the NRICH tasks from the study. Feedback from student focus groups and teacher interviews will be highlighted, along with strategies to support teachers in this work.

Christine Weiss, Trinity Episcopal School, Charlotte, North Carolina
Wendy Lewis, Mooresville Graded School District, North Carolina

**100** Using Data to Guide Decisions about Multiplication Fluency

3–5 Session
Baltimore Convention Center, Ballroom 1

When assessing multiplication, are flexible, efficient strategies assessed along with accuracy? How might we strengthen foundational understanding of multiplication fluency, so our young learners are prepared for deeper, more complex work as they grow? Student empowerment and making data-driven decisions are at the crux of this work.

Jill Gough, Trinity School, Atlanta, Georgia
Kerry Coote, Marietta, Georgia

**101** Using Virtual Manipulatives to Engage Students in Deep Mathematical Exploration and Discovery.

6–8 Session
Baltimore Convention Center, 310

Manipulatives can transform how students make meaning of important ideas by making abstract relationships visible, by teaching creativity and problem-solving, and by allowing students to explore and discover. Learn how virtual manipulatives can mirror these effects and support more complex interactions that are not possible in the physical world.

David Poras, Weston Public Schools, Mathigon, Newton, Massachusetts
Twitter: @davidporas

**102** Your Average Pencil: What Does That Mean?

6–8 Session
Baltimore Convention Center, 316

In our search for new middle school mathematics activities that require very few and inexpensive materials yet integrate several concepts, we developed this hands-on activity and named it Your Average Pencil activity. Concepts covered are measurement, estimation, exponents, multiples, mean, median, range, graphs, patterns, and functions.

Kathleen Mittag, University of Texas at Austin, Retired Professor
Sharon Taylor, Georgia Southern University, Statesboro

**103** Five Strategies to Engage Students in Formative Assessment

8–10 Session
Baltimore Convention Center, Ballroom 2

Students often struggle to understand and, in many cases, end with only a formulaic conception of important ideas. The session will engage participants in thinking about instructional strategies, including ways to give feedback, that give every student an opportunity to develop their understanding and to take an active part in the work of learning.

Gail Burrill, Michigan State University, Hales Corners, Wisconsin

**104** A Two-Ton Problem: Using Hippos to Increase Student Choice

10–12 Session
Baltimore Convention Center, 319–320

In this session, participants will examine a model-building activity through the lens of student choice. This activity will allow participants to analyze the hippopotamus crisis caused by Pablo Escobar and his four hippos. Participants will engage with data analysis, exponential functions, and a discussion about how student choice affects modeling.

Ashley Loftis, North Carolina School of Science and Mathematics, Durham
Twitter: Ashley Loftis
Mahmoud Harding, North Carolina School of Science and Mathematics, Durham

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NCTM Regional Conference & Exposition  •  Baltimore • November 30 – December 2, 2022
Thursday Afternoon Sessions

105 Transformation Graphing: Interactive Activities, 250+ Video Series, 15 Parent Functions, Composition

10–12 Session
Baltimore Convention Center, 341–342
Use technology to visualize and graph 15 parent functions “by hand” and explore/discover patterns of 6 transformations. See strategies for in-class or online instruction using free videos with 500+ animated colorful examples of prealgebra to calculus. See how to teach transformation graphing as composition of functions. Get e-flash cards and tons of materials.

Tom Reardon, Fitch High School/Youngstown State University, Columbus, Ohio
Twitter: @tomreardon3

106 Empowering Students through Culturally Relevant Instruction

Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 309
For students to learn mathematics, they must see themselves in the mathematics. Culturally relevant instruction provides teachers with powerful strategies to empower students and build their identities as scientists or mathematicians. Let’s explore how teachers and leaders can design structures to support culturally relevant instruction.

Paul Gray, NCSM: Leadership in Mathematics Education, Dallas, Texas
Twitter: @Dr_PaulGray

107 Are We Listening? Creating Opportunities to Hear Students’ Mathematical Thinking

General Interest Session
Baltimore Convention Center, 317
Does assessment offer ways to center students’ thinking and strengthen their identities? Yes! In this session, we evaluate the cognitive complexity of mathematical opportunities given to students. Through formative conversations, we listen to students and leverage assets to determine the supports needed to access complex mathematical ideas.

Ted Coe, NWEA, Scottsdale, Arizona
Twitter: Ted Coe
Shelbi Cole, Student Achievement Partners, Trinity, Florida

108 Bridging for Math Strengths: From Formative Assessment to Routines, Tasks, and Games for K–8 Students

General Interest Session
Baltimore Convention Center, 318–321
The Bridging for Math Strengths resources support asset-based instruction where teachers identify student strengths within a specific math learning trajectory and provide purposeful activities, formative assessments, lessons, rich tasks, and games that are designed to bridge students’ prior content knowledge with grade-level content.

Jennifer Suh, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; George Mason University, Fairfax, Virginia
Twitter: completemath
Theresa Wills, George Mason University, Springfield, Virginia
Sara Kirschner, George Mason University, Arlington, Virginia
Maureen Vora, George Mason University, Fairfax, Virginia
Kate Roscioli, Prince William County Schools, Bristow, Virginia

109 Grants, Scholarships, and Awards for NCTM Members

General Interest Session
Baltimore Convention Center, 329
Looking for funding for a special project, coursework, or professional development? NCTM’s Mathematics Education Trust (MET) has over 35 different grants, scholarships, and awards available to NCTM Members. Get information on all of these different opportunities to improve the mathematics teaching and learning in your classroom, school, or district.

Karen Karp, Johns Hopkins University, Baltimore, Maryland
Twitter: @ksquaredmath1

109.1 Exploring Computational Thinking and Coding in Math Class

8–10 Exhibitor Workshop
Baltimore Convention Center, 336
Coding is a skill that is in high-demand for STEM careers. But how does computational thinking connect to the big ideas in my math class? See how to use this different representation of mathematics to promote critical thinking and boost engagement in your algebra classes. No prior programming experience is required.

Texas Instruments, Sacshe, Texas

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Thursday Afternoon Workshops  
2:45 p.m.–4:00 p.m.

110  Building Equity of Student Voice through Daily Number Sense Routines in the PK–Grade 2 Classroom.  
PreK–2 Workshop  
Baltimore Convention Center, 322–323  
Meaningful mathematical discourse rooted in daily standards-based number-sense routines creates space for equitable student voice. Join us for a deep dive into the implementation of routines that build mathematical confidence, lift student voice, and encourage diverse thinking in an intellectually and emotionally safe learning environment.  
Dawn Caine, Calvert County Public Schools, Owings, Maryland  
Twitter: @HelloMrsCaine  
Jennifer Young, Calvert County Public Schools, Prince Frederick, Maryland

111  Developing and Assessing Young Learners’ Mathematical Sense Making with Number Racks  
PreK–2 Workshop  
Baltimore Convention Center, 324–326  
The Number Rack (aka Rekenrek) is an effective tool for developing young learners’ ability to see and understand number relationships. In this session, we will make Number Racks, explore powerful PK–2 activities, and investigate a comprehensive assessment tool that supports systematic observation of students’ development to guide instruction.  
Kimberly Markworth, The Math Learning Center, Bellingham, Washington  
Shelly Scheafer, Bend, Oregon

111.1  Connections & Community: Developing Teacher and Parent Partnerships to Promote Joy in Mathematics  
Pre-K to 2 Workshop  
Baltimore Convention Center, 349–350  
Developing connections between families and educators is essential for all students to feel supported and encouraged as mathematical thinkers. Learn how we are fostering connections, positive relationships, and productive dispositions in mathematics through events for parents and families to encourage mathematical curiosity and joy!  
Molly Rawding, Lexington Public Schools, Chelmsford, Massachusetts  
Twitter: @RawdingMolly  
Kate Gaffney, Chelmsford Public Schools, Massachusetts  
Karen Grabowski, Chelmsford Public Schools, Massachusetts  
Kaitlyn Nagle, Chelmsford Public Schools, Massachusetts

112  Experiences before Explanations: Effective Mathematics Instruction  
3–5 Workshop  
Baltimore Convention Center, 339–340  
Traditionally, we explain and then give an experience for students to apply their learning. What if we flipped it? Experience gives learners equitable access to the content while allowing them to develop their agency. Explanation after the experience gives students a richer understanding of the math concept and a deeper connection to the learning.  
Leigh Diebold, Baltimore County Public Schools, Bel Air, Maryland  
Carrie Burdon, Tucson Unified School District, Arizona  
Debbie Black, Tucson Unified School District, Arizona

113  What Are Our Students Thinking? Find Out through Mathematical Writing Prompts  
3–5 Workshop  
Baltimore Convention Center, 307  
Mathematical writing prompts can be a great way to promote student thinking and allow teachers to formatively assess their students’ reasoning. But what types of writing prompts actually work? Join us to learn five practical approaches for creating writing prompts that maximize student thinking. Collaborate with others to develop your own prompts.  
Tutita Casa, University of Connecticut, Storrs Mansfield  
Stacy Hayden, Shaffer Evaluation Group, Williamsburg, Virginia  
Elizabeth Canavan, Ellington, Connecticut  
Andrew Kuck, University of Connecticut, Storrs  
Fabiana Cardetti, Storrs, Connecticut

114  Try It Before You Buy It: Developing Math Vocabulary through Exploration  
6–8 Workshop  
Baltimore Convention Center, 343–344  
How do you define peloozoid? Explore vocabulary acquisition by putting yourself in the role of a learner again. Experiment using common tools with a team to learn how to help students understand the term proportional relationship. Using what you learned, you will be empowered to nurture students’ understanding of new terminology more effectively.  
Valerie Weage, Great Minds, Richmond, Virginia  
Twitter: @vweage  
Erika Silva, Great Minds, Washington, District of Columbia

Join us at the 2023 NCTM Annual Meeting & Exposition in Washington, DC, from October 25-28, 2023!
115  (Still) Striving for Equity: Taking Action to Support Your Black Students in Math Class
8–10 Workshop
Baltimore Convention Center, 315
Although NCTM has been calling for equity in mathematics classrooms for decades, evidence suggests that much to do still remains to support all students. We focus this session on supporting Black students’ classroom-level needs and invite reflection on individual and collective questions for professional learning that inspires change.
Lateefah Id-Deen, Kennesaw State University, Georgia
Twitter: @Prof_IdDeenL
Rachelle Ebanks, Smyrna High School, Smyrna, Delaware
Michelle Cirillo, University of Delaware, Newark

116  Interactive Graphs: Helping Students Explore and Visualize Mathematics
8–10 Workshop
Baltimore Convention Center, 314
Graphing technology can be great! But have you ever noticed that it can also remove students’ learning opportunities by doing the work for them? In this workshop, participants will go beyond traditional applications of graphing technology by creating interactive graphs and exploring how they can be used to drive student exploration.
Jonathan Swotinsky, NYCDOE–Inwood Early College for Health and Information Technologies (06M211), New York, New York
Janessa Tamayo, Inwood Early College for Health and Information Technologies, New York, New York

117  The Mathematics of Gerrymandering: Engaging and Authentic Tasks with Civic Significance
8–10 Workshop
Baltimore Convention Center, 301–302
Gerrymandering refers to manipulating district boundaries to provide a political advantage and is ideal for mathematical study in grades 7–12. This workshop will engage participants in three hands-on tasks exploring the mathematics of gerrymandering, including redistricting puzzles as well as examining numerical and geometric measures of fairness.
Kimberly Corum, Towson University, Nottingham, Maryland
Sandy Spitzer, Towson University, Maryland
Kristin Frank, Towson University, Maryland

118  Making Parametric Modeling Come Alive
10–12 Workshop
Baltimore Convention Center, 347–348
Learn about parametric modeling of motion using manipulatives and technology, including Mario Kart, Desmos, GeoGebra 3D, and Tracker. Experience gathering data to create a model, visualizing it in Desmos, and understanding how to apply calculus to the model to find velocity, acceleration, speed, and total distance traveled.
Hunter Dickenson, Hanover County Public Schools, Mechanicsville, Virginia

119  The Amazing Inverse Trig Function Race and Other Inclusive Math Learning Experiences
10–12 Workshop
Baltimore Convention Center, 308
We don’t have time for games and fun activities in our advanced math classes. But wait! What if our game or activity is a true learning experience with a clear and specific mathematical focus? The first activity involves students in thinking about the many ways we can identify a location by graphing a word. Then we will play the inverse trig game.
Janet Sutorius, Mathematics Vision Project, Nephi, Utah
Twitter: @JanetMSutorius
Scott Hendrickson, Mathematics Vision Project, Lehi, Utah

120  Conferring to Support the Development of Proof, K–8
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 337–338
What stands as a viable argument in mathematics and how can we develop students’ ability to write one in the K–8 years? This workshop is highly interactive and is designed using a hybrid model, allowing participants to engage with the materials and the presenters both during and after the conference. Please bring laptops and earbuds.
Catherine Fosnot, New Perspectives on Learning, LLC, New London, Connecticut
Maarten Dolk, New Perspectives Online, New London, Connecticut
Bill Jacob, UCSB, Santa Barbara, California

120.1 Romancing Mathematics: Teaching and Learning Begins with Our Heart
6 to 8 Workshop
Baltimore Convention Center, 327
The idea that learning new math content will lead to better pedagogy is best exemplified by the learning of math history and how it helps us romanticize the learning and teaching of it. These math ideas/problems not only help with understanding the thematic development of math, but also strengthen our attraction to learning and teaching it.
Sunil K. Singh, Amplify, Toronto, Ontario
Twitter: @Mathgarden
Thursday Afternoon Sessions

4:00 p.m.—5:00 p.m.

121 Students as Mathematicians: Making Use of SMP 7 and SMP 8
PreK–2 Session
Baltimore Convention Center, 318–321
Fostering an environment in which students see themselves as mathematicians is essential for implementing equitable mathematics instruction. Teachers can help by providing opportunities for students to engage with the Standards for Mathematical Practice (SMP). We will discuss how to effectively promote the SMP in class, focusing on SMP 7 and SMP 8.

John Reynolds, Great Minds, Richmond, Virginia

122 Using Formative Assessment Results to Differentiate Mathematical Instruction
3–5 Session
Baltimore Convention Center, 331–332
Participants will learn how to analyze formative assessment data to create instructional groupings. They will be given practical, data-driven ways to differentiate groups, while maintaining a safe and effective learning environment. Participants will learn how to close learning gaps while maintaining student engagement in mathematical content.

Heidi Aforismo, Canterbury Public Schools, Connecticut
Andrew Kuck, University of Connecticut, Storrs

123 Encouraging Discourse to Deepen Math Learning
6–8 Session
Baltimore Convention Center, 303
How can we foster math classroom communities where all students can meaningfully engage in fruitful math conversations? This session will explore strategies for facilitating authentic student discourse as well as the role of digital learning in deepening students’ engagement and helping students bring their whole selves to the math classroom.

Shaka Phillips, Zearn, Brooklyn, New York
David Lowe, Zearn, New York, New York

124 Making the Mathematical Practices a Routine Focus of Mathematics Learning and Problem Solving
6–8 Session
Baltimore Convention Center, 310
In this session, we will explore three habits of thinking described in the math practice standards. Learn concrete strategies and an instructional routine to help all your students experience the power of the math practices. Leave ready to engage them in the practices and watch the lights go on as they make sense of math content and problems.

Grace Kelemanik, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Fostering Math Practices, Nantick, Massachusetts
Twitter: @gracekelemanik
Amy Lucenta, Fostering Math Practices, Natick, Massachusetts

125 Creating and Innovating in the Algebra Classroom through Computer Programming.
8–10 Session
Baltimore Convention Center, 341–342
Learning by teaching and by creating have the ability to catalyze deep, enduring learning experiences. This session presents a powerful but underutilized way to invite students into both of these experiences. It shows how students can teach through programming and create web-based algebra applications that are tangible results of their learning.

Robert Richardson, Johns Hopkins University, Baltimore, Maryland

126 Exploring Relationships among Variables Using CODAP
8–10 Session
Baltimore Convention Center, Ballroom 2
Explore middle and high school statistics content to compare distributions and model relationships between variables using CODAP (Common Online Data Analysis Platform). Consider how to represent, summarize, and describe univariate, bivariate, and multivariate data to explore relationships. Brainstorm activity adaptations for use with your classes.

Susan Peters, University of Louisville, Kentucky

127 Implementing Catalyzing Change: Challenges and Successes
8–10 Session
Baltimore Convention Center, 319–320
This session will describe the work of one suburban high school district in its struggle to implement the recommendations of Catalyzing Change, provide examples of promising intermediate steps, and offer suggestions for others who are struggling to gain momentum.

Mark Russo, Pascack Valley Regional High School District, Montvale, New Jersey

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
128 Student Language Matters: Leveraging Disadvantaged Students’ Words to Build Mathematical Identity

10–12 Session
Baltimore Convention Center, 309

Students’ words offer not only a window into their thinking, but also a pathway toward developing mathematical agency and belonging. Leave with instructional strategies that lift up every student’s words to promote equity in the classroom and allow us to reach learners who are disadvantaged, disengaged, and disenchanted with their school system. 

Katherine Muelling, Sheila C. “Skip” Nowell Leadership Academy, Providence, Rhode Island
Twitter: Kate

129 Mathematics for Multispecies’ Flourishing

Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 317

Widespread and sustained human flourishing has never happened—or will it—without simultaneous attention to the flourishing of our multispecies kin. We will explore a deep ethics for mathematics education making connections to financial literacy and familial curriculum as a necessary and fundamental aspect of culturally responsive justice work.

Steven Khan, Brock University, St Catharines, Ontario

130 Relationship is More than a 12-Letter Word

General Interest Session
Baltimore Convention Center, 316

Relationships are more than knowing students’ names. Relationships are community-fostering partnerships within the classroom, affecting the experiences of both the teacher and student. This session will cover teachers’ philosophy and mindset, expectations, and culturally responsive strategies as vehicles to attain educational equity in mathematics.

David McCarter, Cumberland County Schools, Fayetteville, North Carolina
Twitter: @DavidMcCarterJr
LaToya King, Cumberland County Schools, Fayetteville, North Carolina

131 Unmask One! The Master of Disguises

General Interest Session
Baltimore Convention Center, Ballroom 1

Participants will be exposed to student thinking related to unmasking the number 1 across grades 3–16, which occurs in many forms across these grades. Often, 1 is masked in rote procedures where students miss the concept of multiplying by the multiplicative identity. Interview results and strategies to help student understanding will be shared.

Dovie Kimmins, Middle Tennessee State University, Murfreesboro
Jeremy Winters, Middle Tennessee State University, Murfreesboro

131.1 Using Manipulatives to Build Conceptual Understanding- Grades 6-8 + Algebra

6–8 Exhibitor Workshop
Baltimore Convention Center, 336

Explore how to help deepening student understanding and build conceptual understanding using hands-on lessons for grades 6-8 and Algebra. These are standards-aligned lessons, involving manipulatives, that are engaging and easy to implement in whole class and small group. Example lesson provided and enter to win a Hands-On Standards Program.

hand2mind, Inc., Vernon Hills, Illinois

CPM Educational Program

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MORE MATH FOR MORE PEOPLE

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Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
132 Spatial and Number Sense: Working as Partners
PreK–2 Burst
Baltimore Convention Center, 349–350
In this session, participants will explore tasks that engage students in spatial and numerical thinking. These tasks provide opportunities for students to develop number sense through thinking in collections. Focusing on building mental images associated with numerals and the spoken word can lead to a rich mathematics classroom.

Sandra Davis Trowell, Valdosta State University, Georgia
Twitter: Sandra D. Trowell

133 Game-Based Learning Environments for Conceptual Fraction Problem Solving and Student Discourse
3–5 Burst
Baltimore Convention Center, 327
Educators must implement instruction that proactively considers the needs of all students, considering issues of engagement, access, and conceptual growth. In this session, we share Dream2B, a web-based universally designed fraction game and curriculum with ideas for strengthening mathematical argumentation and promoting discourse between students.

Alejandra Duarte, North Carolina State University, Raleigh
Twitter: @alejduarte06

134 Teaching without Telling: Fraction Tasks Based on Learning Trajectories
3–5 Burst
Baltimore Convention Center, 322–323
The proper teaching of fractions relies on having students build on their own reasoning and available prior concepts. Discover how to enhance your Common Core fraction instruction with tasks informed by research. Task sequences designed to promote conceptual understanding will be presented. The tasks and student work will be analyzed.

Melike Kara, Towson University, Baltimore, Maryland
Twitter: Melike Kara

135 Using Picture Book Biographies to Develop Mathematics Identity
3–5 Burst
Baltimore Convention Center, 308
Participants will learn how including read-alouds of picture book biographies of mathematicians can strengthen mathematics identity and spark wonder and joy. Strategies will be demonstrated using sample texts. How these activities can help students develop an inclusive definition of a mathematician will be discussed.

Monica Merritt, Mount Saint Mary College, Newburgh, New York

136 Creating a Culture of Statistical Skeptics with CODAP
6–8 Burst
Baltimore Convention Center, 314
CODAP is a free, powerful online tool allowing students to analyze data sets in real time to question and critique issues that affect the world around them every day. If you’re looking for a game changer to bring engaging conversation, discovery, and depth to your statistics standards, we’ll share why CODAP is a “must have” for our classes!

Shauna Hedgepeth, Purvis Middle School, Hattiesburg, Mississippi
Twitter: @approx_normal
Joel Bezaire, University School of Nashville, Tennessee

137 Mindfulness and Mathematics
6–8 Burst
Baltimore Convention Center, 337–338
Stress and anxiety seem to be ever-present in today’s world. Teachers are stressed about how to support their students while moving forward with grade-level content. Students’ anxiety can be a barrier in their learning. In this session, you will learn about techniques to reduce stress and anxiety for yourself and your students.

Krista Holstein, CPM Educational Program, Cary, North Carolina

138 Understanding the Equals Sign = Algebraic Success for Students with Disabilities
6–8 Burst
Baltimore Convention Center, 307
Many students with learning disabilities struggle with algebra because of an underdeveloped understanding of fundamental topics necessary to develop a coherent, conceptual understanding of the subject. This session will present results from an intervention focused on equality and equations that closed the gap for students with disabilities.

Jason Miller, Baltimore County Public Schools, Glen Burnie, Maryland

4:30 p.m.—5:00 p.m.
Thursday Afternoon Bursts
Thursday Afternoon Bursts

139 The Frayer Model: Making Algebra and Geometry Easier to Understand
8–10 Burst
Baltimore Convention Center, 315
Do your students struggle with algebra and geometry vocabulary? During this burst session, I will demonstrate how the Frayer Model, a simple graphic organizer, can be used to help your students understand algebra and geometry vocabulary better. You will leave with several examples of adapted Frayer models for your classrooms.
Suzanne Milkowich, Jim Thorpe Area School District, Pennsylvania
Twitter: @smilkowich

140 Metacognitive Strategies to Help College-Bound Students (with Autism) Thrive
10–12 Burst
Baltimore Convention Center, 301–302
How can we help students build metacognition and a growth mindset? I will share how I have used wrappers and final drafts to help students analyze the types of mistakes they are making, learn how to study more efficiently, and clearly justify their reasoning using appropriate notation.
Amy Bigelow, Franklin Academy, East Haddam, Connecticut

141 The Infinitude of the Primes
10–12 Burst
Baltimore Convention Center, 343–344
Euclid’s proof that there are an infinite number of prime numbers is famous and well-known but on the other hand widely misunderstood. We will walk through the proof and address some common points of confusion. We will also take a detour to talk about proofs by infinite descent and proofs via strong induction.
William Rose, Montgomery Blair High School, Silver Spring, Maryland
Twitter: @dodecahedra

142 Nurturing a Culture of Productive Professionalism: How Do You Do?
Coaches/Leaders/Teacher Educators Burst
Baltimore Convention Center, 324–326
Are the math educators in your school/district authentically engaged in a culture of productive professionalism? Whether you can say yes or wish you could, come collaborate around how to enable shared beliefs, build relationships, and establish culturally sustaining practices in your learning communities in order to foster greater student learning.
Katey Arrington, University of Texas at Austin
Twitter: @ArringtonKatey

143 Class Openers and Quick Games to Foster Numeric, Algebraic, and Geometric Thinking
General Interest Burst
Baltimore Convention Center, 347–348
Teachers are always looking for new openers, games, and puzzles to add to their repertoire because these are all effective ways to spark student engagement at the start of class. Learn a variety of games, openers, and puzzles that can be used to foster numeracy skills, algebraic thinking, and geometric understanding with students of all ages.
David Poras, Weston Public Schools, Mathigon, Newton, Massachusetts
Twitter: @davidporas

144 Math on Main! Creating a Community of Mathematicians
General Interest Burst
Baltimore Convention Center, 339–340
Math on Main is a fun and engaging community event for students and families to see how math is used in daily operations of local businesses. PK–12 students visit designated locations along Main Street to see demonstrations and solve problems related to each business, and think critically and creatively about math in their community!
Melanie Jenkins, Gloucester County Public Schools, Virginia
Twitter: Melanie Jenkins
Kristen Heaney, Gloucester County Public Schools, Virginia

4:30 p.m.–5:00 p.m.

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning

Ignite Your Community: Partnering to Plan and Support Success for Students

Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom

Ignite Your Power: Lifting Up Each and Every Person

Ignite Student Learning: Capitalizing on the Formative Assessment Process
Friday Morning Sessions
7:15 a.m.—7:45 a.m.

145 Regional Conference Overview and Orientation
General Interest Workshop
Baltimore Convention Center, 307
Whether you’re new to NCTM or a seasoned veteran, there is something for you at the conference! Hosted by members of the Board of Directors, this session will show you how to maximize your overall conference experience. Learn all the new, innovative aspects this year’s meeting is showcasing or discover something you’ve missed in the past. Find out how to navigate presentations, learn how to use the conference app, and network with other attendees.
Zandra de Araujo, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Florida, Gainesville
Twitter: @zdearaujo

Friday Morning Sessions
8:00 a.m.—9:00 a.m.

146 Algebraic Properties: The Structure of Understanding and Fluency in Elementary School
PreK–2 Session
Baltimore Convention Center, 303
Algebraic properties play a critical role in helping students understand and fluently operate with the four basic operations. Participants will leave this session with a better understanding of how to help students experience the structure of properties. Multiple examples will be used to explain how properties are used across K–grade 5.
Jeremy Winters, Middle Tennessee State University, Murfreesboro
Dovie Kimmins, Middle Tennessee State University, Murfreesboro

147 Flexibility through Facts: Addition and Subtraction
PreK–2 Session
Baltimore Convention Center, 317
Let’s explore the heart of flexible strategic thinking for addition and subtraction. We will learn how to interview students to discover where to begin and then discuss how we can facilitate flexible thinking, starting with basic facts and then naturally apply them to various sets of numbers students will encounter on their K–5 math journeys.
AnnElise Record, Ann Elise Record Consulting, Concord, New Hampshire
Twitter: @AnnEliseRecord

148 All Kids Are Math Kids: Exploring Strategies for Equitable Math Learning
3–5 Session
Baltimore Convention Center, 329
How can integrating social-emotional and academic learning reduce counterproductive struggle? This session explores two pillars for meeting all students’ needs: (1) representing all students in math learning builds confidence, and (2) asking “friendly questions” as on-ramps to complex problems encourages self-management and promotes student effort.
Shaka Phillips, Zearn, Brooklyn, New York
Stephanie Ely, Zearn, New York, New York
Chanda Johnson, Zearn, New York, New York

149 Learn How to Break Barriers, Expand Equity, and Engage Struggling Students by Using Game-Based Learning!
6–8 Session
Baltimore Convention Center, 310
Why do we ask teachers to use hands-on, interactive techniques? Because they tap into the natural human instinct to learn through experience. Gaming is a powerful medium that creates excitement and builds confidence. In this session, we will discuss how to integrate an exciting game-based learning platform into your curriculum.
Shelly Pine, Prince William County Public Schools, Manassas, Virginia
Janet Pittock, Legends of Learning, South Lake Tahoe, California
Friday Morning Sessions

150  Strategies for Developing Conceptual Understanding in Algebra
- 8–10 Session
- Baltimore Convention Center, 316
- We will use a fast-food menu to connect students to algebraic concepts. We’ll address substitution of variables, word problems, combining like terms, distribution, the properties of algebra, solving equations, and systems of equations. This simple and effective approach has been proven with students from grades 4 through high school.
- Brad Scott Fulton, Mistletoe Elementary School, Millville, California
- Twitter: @tttpress

151  The Who, What, How, Where, and Why of Formative Assessment
- 8–10 Session
- Baltimore Convention Center, 309
- Who are you assessing? Specifically what topics are you assessing? How are you assessing? Is the assessment a distancing learning assessment, online asynchronously or synchronously, or in-person? What is the purpose of the assessment? These questions and several others on formative assessment will be addressed.
- Dianna Sopala, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Newark Public Schools and Saint Peters University, Newark, New Jersey
- Twitter: @DiannaNJMathEdu

152  Catalyzing Change in High School through Four Pivotal Understandings
- 10–12 Session
- Baltimore Convention Center, 318–321
- As noted in NCTM’s Catalyzing Change series, high school mathematics continues to leave many students behind. To experience the joy, wonder, and beauty of mathematics, students must be able to see mathematics as a meaningful, coherent whole. I share four pivotal understandings that serve to unify and bring coherence to the content of high school math.
- Mike Steele, National Science Foundation, Alexandria, Virginia
- Twitter: mdsteele47

153  Effective ≠ Equitable: Examining Effective Questioning Techniques
- 10–12 Session
- Baltimore Convention Center, 341–342
- How do we know if our effective instructional strategies are effective for all students? While investigating the relationship between the factors of a polynomial and its graph, we will examine the importance of race-consciousness and our identities in the classroom. We will reflect on how our questioning techniques either create or prevent equity.
- Emily Howard, Teaching Lab, Washington DC, District of Columbia
- Twitter: Emily Howard
- Ryan Colon, Teaching Lab, Washington, District of Columbia

154  Five to Thrive: Your Biggest Questions about Using Fermi Problems to Develop Logic and Thinking
- Coaches/Leaders/Teacher Educators Session
- Baltimore Convention Center, Ballroom 1
- Fermi problems are great problems that support students in engaging logically in mathematics. These estimation problems provide opportunities for students to persevere in making sense and seeking solutions, developing mathematical models, critiquing their own and others’ solutions strategies and arguments, and using appropriate tools and language.
- Fred Dillon, Fred Dillon, Strongsville, Ohio
- Ayanna Perry, Knowles Teacher Initiative, Moorestown, New Jersey
- Twitter: fdizzle1955
- Twitter: Emily Howard

155  Changing the Story: Using Math Workshop to Help Students Build Confidence and Reach Their Potential
- General Interest Session
- Baltimore Convention Center, 319–320
- How can we “change the story” for students who have unfinished learning and math anxiety? Math workshop allows teachers to differentiate and creates an environment where students feel less anxious, take risks, and engage in discourse. This session explores how moving to a workshop model is best for everyone by changing what math class looks like.
- Erven Skip Tyler, Henrico County Public Schools, Richmond, Virginia
- Twitter: @skiptylermath

156  To Be Blunt: Too Many Students Are Being Harmed by Our Unwarranted Compliance
- General Interest Session
- Baltimore Convention Center, Ballroom 2
- This session is a rousing call to arms to take the reins (as so many did during the pandemic) and make “bottom-up” change the norm in our mathematics education business. Yes, I’m angry, but I’m also guilty. There are so many obstacles that get in the way of great teaching and far deeper student learning. We’ll explore a range of these obstacles.
- Steven Leinwand, American Institutes for Research, Washington, District of Columbia
- Twitter: @steve_leinwand

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process

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NCTM Regional Conference & Exposition
Baltimore • November 30 – December 2, 2022
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| 157 | Educational LARP: Making Sense of Mathematics through Joyful Play | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 343–344 | Take mathematical inquiry to the next level with educational live action role play (EduLARP), which leverages children’s natural inclination to play to support deep understanding while promoting engagement. Students and teachers co-create an imaginary world with constraints meant to allow students to solve meaningful problems in a joyful setting. **Alejandra Duarte,** North Carolina State University, Raleigh
**Amanda Siepiola,** n/a, Austin, Texas
**Valerie Faulkner,** North Carolina State University, Durham |
| 158 | Finding the Wonder, Joy, and Beauty of Mathematics through Numeracy Routines | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 347–348 | Catalyzing Change’s key recommendations charge educators to ensure every student “experience[s] the wonder, joy, and beauty of mathematics.” In this workshop, participants will engage in numeracy routines that showcase this recommendation and the equitable mathematics practices, including mathematical discourse and student agency. **Kate Roscioli,** Prince William County Schools, Bristow, Virginia
**Brooke Souders,** Prince William County Schools, Mansassas, Virginia |
| 159 | Upper Elementary Mathematics Lessons to Explore, Understand, and Respond to Social Injustice | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 327 | In this workshop, we will explore teaching math for social justice (TMSJ) in upper elementary grades. Participants will explore a TMSJ lesson plan template and will actively engage in a math lesson to explore, understand, and respond to social injustice and critically reflect on the possibilities and tensions of teaching math for social justice. **Tonya Bartell,** Michigan State University, East Lansing
**Cathery Yeh,** Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Texas at Austin
**Mathew Felton-Koestler,** Athens, Ohio |
| 160 | Curiosity, Competence, and Connections: Three Elements to Spark Student Joy and Wonder in Math | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 322–323 | We will experience how creating a sense of curiosity and competence among students supports learning mathematics with connections and can accelerate students’ overall success. This powerful approach is rooted in rejecting practices of exclusion and rehumanizing the teaching and learning of mathematics. **Mark Ellis,** CSU Fullerton, California
Twitter: @EllisMathEd |
| 161 | Social Emotional Learning: What Does Math Have to Do with It? | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 324–326 | Strengthen SEL in your classroom by prioritizing the Social Emotional and Academic Development (SEAD) themes: Agency, Belonging, Discourse, and Identity. Engage in a math task, and connect the themes with the Standards for Mathematical Practice and Content to promote a safe, equitable, and empowered class culture. **Jocelyn Dunnack,** CPM Education, Elk Grove, California
Twitter: @JocelynDunnack
**Alexis Reid,** High School for Construction Trades, Engineering, and Architecture, Ozone Park, New York |
| 162 | Finding Joy in Combining Mathematics with Wordplay, Pattern, and Shape Poetry and Secret Writing | 8:00 a.m.–9:15 a.m. | Baltimore Convention Center, 337–338 | Wordplay offers many engaging topics that lend themselves to use in a math classroom. In a gallery walk, we will view palindromes, anagrams, and ambigrams that can be used to teach math with joy; we will read and create poems using patterns and shapes; we will examine and make social justice messages that become visible when we change our view. **Ron Lancaster,** Ontario Institute for Studies in Education of the University of Toronto, Hamilton, ONNorthwest Territories |
Friday Morning Workshops

163 Game Show Mania: Simulations for the Classroom
8–10 Workshop
Baltimore Convention Center, 307
This session will feature three simulations of popular TV game show games. Participants will play Deal or No Deal, The Price is Right Dice Game, and Let’s Make a Deal Three Aces game using different simulation methods. Probability, statistics, expected value, and randomness will be the focus of the games participants can use in their classroom.
Sharon Taylor, Georgia Southern University, Statesboro
Kathleen Mittag, Retired Professor, University of Texas at San Antonio, Bishop

164 Inspiring Students by Using Algebra Tiles from Polynomials to Factoring
8–10 Workshop
Baltimore Convention Center, 349–350
Teachers will use algebra tiles to complete algebraic multiplication, factoring, completing the square, and polynomial division exercises. Participants will practice a series of problems they can use with students to build their conceptual understanding of these topics. A series of problems from student lessons are included in the handout.
Mark Jones, CPM, Willington, Connecticut

165 Let the Sun Shine: Using Trigonometry to Model Daylight Data
10–12 Workshop
Baltimore Convention Center, 308
In this session, participants will collect, plot, and model data for the hours of daylight for various world cities using trig functions and technology. Comparisons between cities lead to interesting discoveries, mathematical connections, and perspective of world daylight differences. Leave with an activity that “sheds light” on student learning!
Scott Knapp, Glenbrook North High School, Evanston, Illinois
Twitter: @scottknapp

166 Take a Wild Ride on Your Own Function Roller Coaster!
10–12 Workshop
Baltimore Convention Center, 301–302
Learn to engage students in understanding the results of combining functions by designing roller coasters. Have fun doing mathematics while experiencing pedagogy that supports productive discourse, builds mathematical identity, provides natural opportunities for differentiation, and attains significant mathematical goals.
Barbara Kuehl, Mathematics Vision Project | MVP, Salt Lake City, Utah
Twitter: @barbarakuehl

167 Baltimore Youth Teaching Math for Money: The Algebra Project and Mathematical Identity
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 314
Young people in the Baltimore Algebra Project will share interactive activities they use as co-researchers in a National Science Foundation study of their own mathematical identity as peer-to-peer math teachers. Participants will learn how Algebra Project youth teach math, collect and analyze data on identity, and use research to change math ed.
Jay Gillen, Baltimore Algebra Project, Maryland
Twitter: @jayMGillen

168 Coaching How Teacher’s Follow Up to Create Space for Student Voice
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 315
A teacher’s follow-up can promote access and engagement in mathematical discourse. Participants will explore strategies for coaching on following up to empower, create space, and elicit the thinking for each and every student. Activities include watching video, using checklists, and practice providing feedback about how teachers can follow up.
Amber Candela, University of Missouri–St. Louis
Twitter: @amcan36
Melissa Boston, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Duquesne University, Ellwood City, Pennsylvania

169 Shifting Instructional Practice to Create Anti-Racist Mathematics Classrooms
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 339–340
This workshop provides a reflective and courageous space for math educators to examine the actions and beliefs that drive their daily instructional decisions. Participants will unpack the idea of anti-racist teaching through looking at what they do every day in classrooms (e.g. analyzing mathematics tasks).
Dawoun Jyung, Metropolitan Expeditionary Learning School, Forest Hills, New York
Mary Leer, Bank Street Graduate College of Education, New York, New York

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
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Laurie Speranzo, Institute for Learning, University of Pittsburgh, Quincy, Massachusetts |
| 171     | Good Beginnings for Multidigit Addition and Subtraction               | PreK–2 | Baltimore Convention Center, 318–321 | Heather Dyer, Howard County Public School System, Ellicott City, Maryland |
| 172     | Accelerate Student Learning! Using Formative Assessment Strategies Effectively to Support Learners | 3–5   | Baltimore Convention Center, 319–320 | Natalie Crist, The Math Learning Center, Baltimore, Maryland  
Emily Dwivedi, Towson, Maryland |
| 173     | Leverage Your Students’ Strengths through Powerful Asset-Based Task Design and Implementation | 3–5   | Baltimore Convention Center, Ballroom 2 | Beth Kobett, Stevenson University, Eldersburg, Maryland  
Karen Karp, Johns Hopkins University, Baltimore, Maryland |
| 174     | Catching Up and Moving Forward: Rethinking Tier 1 Intervention        | 6–8   | Baltimore Convention Center, Ballroom 1 | Beth Sappe, Zearn, New York, New York  
Stephanie Ely, Zearn, New York, New York  
Tarik Brown, The Historic Samuel Coleridge Taylor Elementary School, Baltimore, Maryland  
Sheila Burke, The Historic Samuel Coleridge Taylor Elementary School, Baltimore, Maryland |
| 175     | Lifting Student’s Voices through Ethnomodeling Explorations           | 8–10  | Baltimore Convention Center, 316 | Siddhi Desai, University of Central Florida, Orlando  
Janet Andreasen, University of Central Florida, Winter Springs |
Friday Morning Sessions  
9:30 a.m.–10:30 a.m.

176  
Tear-Free Tiered Checkpoints: A Research-Based Review Structure to Build Collaboration and Math Talk  
**10–12 Session**  
Baltimore Convention Center, 329  
Tired of teacher-directed review? This presentation will give you a research-based structure for reviewing before assessments. The tiered checkpoints session will give educators a student-centered strategy to help students work individually, communicate their thoughts and answers with others, and move through established tiers of support.  
*Ben Winchell,*  
Pinkerton Academy,  
Derry, New Hampshire

177  
Coaching Teachers to Lead Effective Number Talks  
**Coaches/Leaders/Teacher Educators Session**  
Baltimore Convention Center, 309  
This presentation will focus on ways to help K–5 teachers lead effective Number Talks. Essential elements include creating environments in which teachers feel safe learning mathematics, developing curiosity about students’ thinking, asking good questions, understanding how to record students’ thinking, and believing students are capable.  
*Ann Dominick,*  
Birmingham-Southern College,  
Alabama  
Twitter: @Dominick_Math

178  
Yes, They Can! Reaching All Learners through Engaging Math Tasks  
**Coaches/Leaders/Teacher Educators Session**  
Baltimore Convention Center, 310  
All elementary students should see themselves as mathematicians! Experience tasks that will engage, support, and enrich all of your mathematicians, including those with IEPs, English Learners, and Gifted students. Participants will engage with Three-Act tasks and other routines for discourse. We will analyze student work from a variety of learners.  
*Kristin DeLorenzo,*  
Flemington-Raritan School District, New Jersey  
Twitter: @KDeLorenzoMath  
*Katie Scheffler,*  
Flemington-Raritan School District, New Jersey

179  
The Development of Proof, K–8, and How to Support It  
**General Interest Session**  
Baltimore Convention Center, 317  
Proof is more than just explaining what one did. It requires the crafting of a logical argument to justify a generalization. It is developmental. It has a landscape of learning comprising big ideas and strategies, just as other topics in mathematics do. Video clips from across the grades will be analyzed as we examine and develop the landscape.  
*Catherine Fosnot,*  
New Perspectives on Learning, LLC, New London, Connecticut

180  
Using Empathy to Empower Mathematicians  
**General Interest Session**  
Baltimore Convention Center, 341–342  
As a veteran educator and parent of a special needs child, now adult, I will share the unique perspective I have into both worlds. After building a foundation of understanding of the need for empathy, I will share ways we as educators can empower these students and their parents within the math class and beyond.  
*Angelia Cargill,*  
High Point Academy, Spartanburg, South Carolina  
Twitter: Angelia Cargill

180.1  
Doing Problems that Matter in Math Class  
**8–10 Exhibitor Workshop**  
Baltimore Convention Center, 336  
Too often, students become disengaged when we focus on answer getting and procedures. How can we open their eyes to see where math can help answer questions that actually matter in daily life? We’ll see how investigating messy, real world problems with the help of technology engages students in meaningful mathematics and taps into their curiosity.  
*Texas Instruments,*  
Sacshe, Texas

180.2  
Teaching Problem Solving to All Students  
**3–5 Exhibitor Workshop**  
Baltimore Convention Center, 328  
Teaching students to reason and problem solve is the cornerstone of quality math instruction. We will highlight several engaging strategies such as Three Reads and Numberless Word Problems that will provide multiple entry points for students to engage in math.  
*STEMscopes by Accelerate Learning,*  
Houston, Texas
NCTM's publication and professional resource packages align with ESSER Funding uses, focus on systemic change and support teachers for improved instructional practices and better student experiences and outcomes.

The U.S. Congress has allocated $190 billion in funding for schools through the Elementary and Secondary School Emergency Relief (ESSER) Fund. There is a significant portion of these funds that have been designated for addressing and responding to the impacts on student learning influenced by COVID.

**ESSER Funding Supports**

- Assessment and Engagement
- Instructional Materials
- Professional Development

Visit NCTM District Solutions nctm.org/districtsolutions for information on available products.
Math Games That Count: More Than Fun and Games—Promoting Math SUCCESS Through Play! 

PreK–2 Workshop 
Baltimore Convention Center, 327

It is absolutely possible for teachers to make math fun, engaging, entertaining and educational for students. Do you feel like you never have enough time? Are you on a tight budget? This workshop is for YOU! We will explore a variety of educational math games using a simple deck of cards or some dice. 

Seema Gersten, Emek Hebrew Academy Teichman Family Torah Center, Sherman Oaks, California
Danielle Lototsky, Emek Hebrew Academy Teichman Family Torah Center, Sherman Oaks, California

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Centering Students: Exploring and Expanding Equitable Mathematics Instruction

3–5 Workshop 
Baltimore Convention Center, 343–344

How are we establishing classrooms that position all students as capable, confident learners and doers of mathematics? Join a PhD student and two EdD Noyce teacher fellows as we explore how equitable mathematics instruction can empower all learners to experience mathematics that is relevant and responsive to who they are as learners and people. 

Treshonda Rutledge, University of Central Florida, Orlando
Abigail Ruiz, University of Central Florida, Orlando
Shane Wiggan, University of Central Florida, Orlando

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How to Make Problem Solving Routine

3–5 Workshop 
Baltimore Convention Center, 307

Teaching problem solving is hard. It is about helping students learn to make sense, think, and reason. Simply, problem solving is not a procedure. Problem solving is not delivered it is developed. And in this session, participants learn how to do just that through engaging daily problem solving routines. Classroom-ready resources will be shared. 

John SanGiovanni, John SanGiovanni, Westminster, Maryland
Twitter: @JohnSanGiovanni

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The 100 Bead String: A Tool You can Count on (and More)!

3–5 Workshop 
Baltimore Convention Center, 347–348

The 100 bead string is a versatile tool that helps students to develop conceptual understanding, procedural fluency and application of a wide range of mathematics concepts in first through fifth grade. This tool also develops fluency by bridging from the concrete to the abstract while making connections between and within representations. 

Kristen Mangus, Howard County Public School System, Ellicott City, Maryland
Twitter: Kristen Mangus

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Incorporating Rough Drafts and Revising into Math Class

6–8 Workshop 
Baltimore Convention Center, 339–340

In this workshop, we will explore how to treat the process of doing mathematics as generating a rough draft, gaining new insights, and revising. Rough draft thinking is a process of continuously developing understanding. When mathematics teachers the strengths in students’ in-progress ideas, mathematics teaching is more equitable. 

Amanda Jansen, University of Delaware, Newark
Twitter: @MandyMathEd

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In the Wake of the Pandemic: How Can We Address Shifts in Student Engagement and Motivation?

10–12 Workshop 
Baltimore Convention Center, 327

Many secondary schools around the country have experienced noticeable shifts in student engagement and motivation as a result of the pandemic. We will examine the work of one school district to look beyond the symptoms to discover and address the root causes by listening to student voices. 

Faith Muirhead, University of Delaware, Newark
Twitter: Faith Muirhead

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning

Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
Friday Morning Workshops

9:45 a.m.–11:00 a.m.

187 Culturally Responsive Teaching Strategies that Create an Environment to Support Independent Learners

8–10 Workshop
Baltimore Convention Center, 315
Participants will have an opportunity to learn in an equitable environment. Learners thrive through mathematics that is meaningful, relevant, and accessible in a safe space. This session will provide you with an opportunity to engage in productive struggle, experience mathematics, and reflect on the strategies used to support you as a learner.

Astrida Lizins, CPM Educational Program, Honey Brook, Pennsylvania
Jocelyn Dunnack, CPM Educational Program, Elk Grove, California

188 Unlocking the Mystery: Competencies that Scaffold the Teaching and Learning of Mathematical Modeling

8–10 Workshop
Baltimore Convention Center, 301–302
A lack of available resources and background knowledge for teaching mathematical modeling has been an obstacle of teachers’ take-up of this important mathematical process. To make progress on the issue, we present a set of research-based Thought Tools and corresponding tasks that support teachers to develop, in students, competencies for modeling.

Michelle Cirillo, University of Delaware, Newark
Twitter: @UDMichy
John Pelesko, University of Delaware, Landenberg, Pennsylvania

189 Climate Change: Math Activities Using Data from Al Gore’s Climate Project and the US Climate Report

10–12 Workshop
Baltimore Convention Center, 308
Obtain the most current climate change data, causes, and consequences. Model this shocking data obtained from attending the Three-Day Climate Reality Training (see Gore’s PowerPoint slides). Students become aware of this important issue with applied mathematics. Obtain all materials: data, student activity sheets, teacher notes, and detailed step-by-step blogs.

Tom Reardon, Fitch High School/Youngstown State University, Columbus, Ohio
Twitter: @tomreardon3

190 Making Sense of Series Convergence Tests

10–12 Workshop
Baltimore Convention Center, 322–323
AP Calculus BC teachers often regard series convergence tests as one of the most challenging topics that they teach. Join your colleagues and engage in the joy of a rich discovery task that uses multiple representations of partial sums to develop procedural fluency with convergence tests from conceptual understanding.

Laura Potter, Baltimore County Public Schools, Towson, Maryland
Twitter: @mrspottermath

191 Using the Desmos Teacher Dashboard to Orchestrate Productive Discussions

10–12 Workshop
Baltimore Convention Center, 349–350
Using pre-populated Desmos Teacher Dashboards and associated classroom video, teachers will practice the skills of notice/monitor student thinking and select/sequence student work in support of facilitating whole class discussions that foreground student sensemaking.

Lara Dick, Bucknell University, Milton, Pennsylvania
Allison McCulloch, Charlotte, North Carolina
Kristen Fye, Charlotte, North Carolina

192 Catalyzing the Change Within: Navigating the Journey toward Equitable Coaching

Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 324–326
Advocating for equitable math instruction that advances learning opportunities for all students is essential, but where to start? In this session we share the DMPMC, a tool that guides coaches’ goal-setting in ways that advocate research-informed practices and facilitates critical conversations about initiating, assessing, and sustaining change.

Courtney Baker, George Mason University, Chantilly, Virginia
Twitter: Courtney Baker
Melinda Knapp, Oregon State University–Cascades, Bend

193 New and Preservice Teachers’ Workshop

General Interest Workshop
Baltimore Convention Center, 314
Find answers to your questions on topics such as classroom management, parents, motivation, and keeping your sanity. Connect with other new teachers, learn from experienced professionals, and find resources to engage you and your students. You might even win a prize!

David Barnes, National Council of Teachers of Mathematics, Reston, Virginia
Twitter: @DavidBarnes360

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
**Friday Morning Sessions**

**194** Same but different math: a language based routine to promote equity in the classroom  
*PreK–2 Session*  
Baltimore Convention Center, 329  
Same but Different Math is a powerful routine for use in a math classroom. This routine can immediately be added into an educators toolbox for developing conceptual understanding of important mathematical ideas. This session will provide teachers with all of the information they need to confidently use this routine with their students.  
**Susan Looney**, Looney Math Consulting, North Easton, Massachusetts  
Twitter: @looneymath

**195** Join the Fun! Social Studying Makes Problem Solving Equitable, Engaging, and Successful for All!  
*3–5 Session*  
Baltimore Convention Center, 310  
Research indicates that minority students can compete with and outperform peers when they talk through math problems together. You will actively participate in a student-centered paradigm that embraces the Principles to Action as it uses student discourse to understand the problem; compare solution plans; make sense of results; and self-evaluate.  
**Robyn Silbey**, Robyn Silbey Professional Development, Gaithersburg, Maryland  
Twitter: Robyn Silbey

**196** Co-Teaching in a Centers Based Math Classroom  
*6–8 Session*  
Baltimore Convention Center, Ballroom 1  
Learn how to effectively implement co-teaching in a centers based math classroom. Gain ideas for types of activities that can be used in centers and where to find these activities. Also, learn how to use assessments to regroup students for centers daily/weekly so that you can differentiate instruction based upon student need and readiness.  
**Cynthia Dorsey**, Clermont Northeastern Middle School, Milford, Ohio  
Twitter: Cynthia Dorsey  
**Alexis Sanders**, Clermont Northeastern Middle School, Batavia, Ohio  
**Joni Bacon**, Clermont Northeastern Middle School, Batavia, Ohio

**197** Power to the (Math) People!  
*6–8 Session*  
Baltimore Convention Center, 319–320  
During the Power to the (math) People the presenters will share best SEL practices that will exponentially raise students’ math identities in a culturally responsive classroom.  
**Cydney Rolle**, Baltimore County Public Schools, Maryland  
Twitter: @cyd1223  
**Salli Warakska**, Baltimore County Public Schools, Towson, Maryland

**198** Algebra Instruction for Students with Disabilities in the Era of Common Core  
*8–10 Session*  
Baltimore Convention Center, 331–332  
This session will summarize recent research on instructional practices for teaching algebra to students with learning disabilities, specifically, (a) concrete-representational-abstract integration, (b) virtual manipulative instruction, and (c) gestures and diagrams. Sample activities will be provided for each instructional practice.  
**Tricia Strickland**, Hood College, Frederick, Maryland

**199** What’s Brilliant Here? Using Student Thinking and Identity as the Center of a Classroom Experience.  
*8–10 Session*  
Baltimore Convention Center, 318–321  
How do we create a learning culture where all students see themselves as powerful and valuable learners? This session introduces teachers to new technologies, new pedagogies, and new curriculum for amplifying the voices of every student and developing their identities as mathematicians, helping them see their own value and the value of their peers.  
**Faith Moynihan**, Desmos, Pipersville, Pennsylvania  
Twitter: @faith_moynihan

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**Ignite Your Awareness: Integrating Social-Emotional and Academic Learning**

**Ignite Your Community: Partnering to Plan and Support Success for Students**

**Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom**

**Ignite Your Power: Lifting Up Each and Every Person**

**Ignite Student Learning: Capitalizing on the Formative Assessment Process**
Friday Morning Sessions

11:00 a.m.–12:00 p.m.

201.1 Climate Change Models for Algebra and Precalculus
10–12 Session
Baltimore Convention Center, 309
Challenge your students with math modeling and data analysis relevant to the world they are growing into as young adults. Arctic sea ice extent, atmospheric CO2 concentration, global average temperature – these can be modeled using the tools of algebra and precalculus, and will give meaning to linear, exponential, and log functions.
Kevin Barkovich, Phillips Exeter Academy, New Hampshire

201.2 Regression Leads to Progression!!
10–12 Session
Baltimore Convention Center, 317
Do your students struggle to make connections between different types of growth encountered while studying various functions? Come explore activities where students use technology and regression models to interpret real-world data. Regression types include linear, exponential, quadratic, and sinusoidal. Let regression inspire progress!
Scott Knapp, Glenbrook North High School, Evanston, Illinois
Twitter: @scottknapp

202 Ignite Community-based Math Modeling to Cultivate Creative Problem Solvers and Young Change Agents
General Interest Session
Baltimore Convention Center, 341–342
This session will present an instructional strategy used school-wide to engage K–6 students in mathematical modeling to solve school and community problems connected to students' lived experiences. We will share modeling tasks that engage students in building awareness of community issues and empowering them to build solutions and take action.
Jennifer Suh, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; George Mason University, Fairfax, Virginia
Twitter: completemath
Susan Call, Westlawn Elementary, Falls Church, Virginia
Kristen Burke, Westlawn Elementary, Falls Church, Virginia
Brett Terrell, Westlawn Elementary, Falls Church, Virginia
Kara McElveen, Westlawn Elementary, Falls Church, Virginia

203 More than Just a Number: Transforming Data Conversations to Change the Narrative
General Interest Session
Baltimore Convention Center, Ballroom 2
How might we shift practices of static deficit labeling of students and schools to develop a culture that cultivates students’ positive mathematics identity as doers of mathematics? During the session participants will engage in conversations about the use of data and strategies to shift the conversations.
John Staley, Baltimore County Public Schools, Maryland
Twitter: @jstaley06

NCTM Regional Conference & Exposition
Baltimore • November 30 – December 2, 2022
Comfortable Discomfort: Normalizing Risk-Taking Challenge in the K-2 Math Classroom
PreK–2 Burst
Baltimore Convention Center, 322–323
It is no secret that math anxiety exists. It becomes a barrier to students accessing higher-level math skills. How can we combat this and strive to build lifelong math learners? We start by building self-efficacy and agency in our youngest learners. Discover strategies to build a learning culture that embraces challenge and encourages risk-taking.
Kelly Sobocinski, North Branford Board of Education, Hamden, Connecticut
Twitter: @KellyAnnSobo

Games to Use During MTSS Interventions That Make Math Fun and Students’ Thinking Visible
3–5 Burst
Baltimore Convention Center, 315
Come learn about engaging card based games to use during elementary MTSS interventions. Conceptually based games with data collection measures will be shared. You will learn how to maximize student engagement in a motivating manner, while simultaneously collecting data on your students’ thinking and progress with the acquisition of facts.
Sararose Lynch, Slippery Rock University, Pennsylvania
Calista Dosch, Slippery Rock University, Pennsylvania
Merritt Montgomery, Slippery Rock University, Pennsylvania
Koryn Jones-Garman, Slippery Rock University, Pennsylvania
Oliva Elk, Slippery Rock University, Pennsylvania

Where are Students & Where Can We Go From Here: Assessing Students’ Level of Geometric Reasoning
3–5 Burst
Baltimore Convention Center, 343–344
Let’s look at the development of geometric reasoning in students! Discussed will be open-ended geometry tasks and two frameworks for examining children’s geometric reasoning elicited in these tasks. Discussed will be ways of gathering this assessment data and how we can use it in lesson planning to better individualize instruction.
Thomas Fox, University of Houston Clear Lake, Texas
Twitter: Thomas Fox

24ing: Building Number Sense and Resilience alongside Students with Learning Differences
6–8 Burst
Baltimore Convention Center, 308
This burst will model and launch interactive applications of practices that can be used to develop number sense and resilience with students who have learning differences that are often compounded by math anxiety. These ideas will be demonstrated using the 24 game while highlighting the importance of teacher language use.
Daniel Roeder, Winston Preparatory School, New York, New York
Twitter: teechshot

Choose-Your-Path Math
6–8 Burst
Baltimore Convention Center, 337–338
Getting kids to see the value of estimation is hard, but we all know how important it is for number sense and general mathematical literacy. Choose-your-path math is a fun, game-board-like format for encouraging students to estimate and strategize before doing any computation, with ample opportunity for student choice and differentiation.
Chris Ignaciuk, Amplify, New York, New York

Math in the Mirror: Lifting Up Diverse Mathematicians to Promote Equity and Mathematical Belonging
8–10 Burst
Baltimore Convention Center, 347–348
When your students think of mathematicians, who comes to mind? In this session, explore a step-by-step process for leveraging the stories of mathematicians of all ethnic, gender, racial, linguistic, and socioeconomic groups to break down stereotypes about who mathematicians are and transform students’ confidence to see themselves as mathematicians.
Katherine Muelling, Sheila C. “Skip” Nowell Leadership Academy, Providence, Rhode Island
Twitter: Kate
Friday Morning Bursts

**211** Power Indices at the Olympics: A Social Justice Mathematics Modeling Lesson

*8–10 Burst*

Baltimore Convention Center, 339–340

How can power indices be used to discuss social justice topics? Power indices can be used to evaluate athletes’ contributions to teams. Session participants will see how the Banzhaf and Shapley-Shubik indices can be used by high school students to analyze the biases in social media reports about the 2022 Winter Olympics figure skating team event.

*Diana Cheng,* Towson University, Ellicott City, Maryland

**212** Student Perspectives on Recommendations for Improving High School Mathematics

*10–12 Burst*

Baltimore Convention Center, 307

This presentation shares research on the relationship between NCTM’s recommendations in Catalyzing Change in High School Mathematics and the educational experiences and attitudes of undergraduate students in their high schools. Results inform multipurpose instruction, future discourse on de-tracking, and classroom emphases on reasoning and history.

*Benjamin Wilson,* Stevenson University, Owings Mills, Maryland

*Guilliana Datnoff,* Stevenson University, Owings Mills, Maryland

**213** Differentiated Coaching—Utilizing the Mathematics Teaching Practices to Provide Teacher Support

*Coaches/Leaders/Teacher Educators Burst*

Baltimore Convention Center, 324–326

This session will engage math leaders in a strengths-based approach to coaching mathematics teachers. By engaging in dialogue with teachers about their knowledge and beliefs of the Mathematics Teaching Practices as well as their perceived implementation barriers, math leaders create a partnership for growth through differentiated coaching.

*Jennifer Gonzales,* Northside ISD, San Antonio, Texas

Twitter: @Gonzales_MSMath

**215** Mathematical Memes and Mindsets

*General Interest Burst*

Baltimore Convention Center, 349–350

Mathematical memes reinforce cultural beliefs and structural norms and can be an important component in understanding social power and influence in mathematics education. This session explores pop culture representations of mathematicians and ways to use these representations to open dialogue about mathematical beliefs.

*Katherine Hammonds,* ALSDE, Auburn, Alabama

**216** Share the Joy: Math Outreach as Service

*General Interest Burst*

Baltimore Convention Center, 314

Since 2015, academically gifted and talented high school students have created problem-solving activities to engage and inspire learners in grades 2-8. These students love math and share that love through math outreach. Consider the activities and impact of this community-minded service in which students become the teachers.

*Lauren Zarandona,* MS School for Math and Science, Columbus, Mississippi

**217** Videos to Scaffold and Increase Student Engagement in a Hyflex Secondary Mathematics Classroom

*Research Burst*

Baltimore Convention Center, 327

In response to the lack of preparation and student engagement, a video is used to introduce the trigonometric topic of the day in lieu of bell work to study the effects on student engagement in a hyflex mathematics classroom. Results show the students preferred the video, and the teacher noticed a visible difference in student engagement.

*Zachary Stepp,* Flagler College, St Augustine, Florida

Twitter: @zachary_stepp

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50  NCTM Regional Conference & Exposition  Baltimore • November 30 – December 2, 2022
Friday Afternoon Sessions

218 The Power of the Number Line
PreK–2 Session
Baltimore Convention Center, 329
Number lines are posted on classroom walls, but how do we use them? How do we help students understand number lines as a tool for computation of whole numbers, fractions, and decimals? From number paths to decimals on a number line, come learn strategies for incorporating this tool into your math instruction.
Michele Glenn, Howard County Public Schools, Ellicott City, Maryland
Twitter: @mathcoachglenn
Kelly Healey, Howard County Public Schools, Ellicott City, Maryland

219 Problems to Ponder—Pondering Powerful Problems
3–5 Session
Baltimore Convention Center, 319–320
Let’s ignite students’ understanding of mathematics through powerful problems to ponder! What makes a problem powerful? How can we find joy, wonder and beauty in mathematics through pondering powerful problems in mathematics? Let’s explore ways to support our students as thinkers and doers of mathematics so support reasoning and sense-making.
Trena Wilkerson, Past President, National Council of Teachers of Mathematics, Reston, Virginia; Baylor University, Waco, Texas
Twitter: @TrenaWilkerson

220 What Can A Classroom Teacher Do To Make Math Tasks Accessible for Multilingual Learners?
3–5 Session
Baltimore Convention Center, 341–342
As a classroom teacher, you may feel unsure how to support the mathematical language development of the multilingual learners (ML) in your classroom. This session will focus on strategies and teacher moves that promote the WIDA Key Language Uses for Mathematics. Participants will walk away with ways to increase access to math tasks for ML students.
Connie Conroy, Howard County Public Schools, Ellicott City, Maryland
Twitter: Connie Conroy

221 Digging into Data to Make Sense of Real World Phenomena
6–8 Session
Baltimore Convention Center, Ballroom 2
Want to engage your students with real world problems to build data literacy? Learn strategies for addressing statistics standards through investigations that will support students’ understanding of how math and statistics can help solve problems with data. Bring your device to investigate data using a free web-based tool.
Gemma Mojica, NC State University, Raleigh, North Carolina
Emily Thrasher, Durham, North Carolina
Hollylynne Lee, NC State University, Raleigh, North Carolina

222 Using Rubrics to Ignite Self-Assessment and Growth Mindset
6–8 Session
Baltimore Convention Center, 318–321
With the goal of helping students be more assessment capable learners, we found that using NCTM’s Problem of the Week rubric for self-assessment of problem-solving skills and communication of solutions and a rubric to self-assess Mathematical Mindset, students became more reflective. We’ll share our rubrics and strategies we’ve found to be helpful.
Jennifer Wall, Northwest Missouri State University, Maryville
Twitter: @JenniWall3
Heidi Komorech, Horace Mann Laboratory School, Maryville, Missouri
Abigail Davis, pre-service teacher, Maryville, Missouri

223 Taking Action: Building Procedural Fluency in High School Classrooms
8–10 Session
Baltimore Convention Center, 309
In this session, participants will explore how sequences of tasks can build high school students’ procedural fluency, using video and activities from “Taking Action: Implementing Effective Mathematics Teaching Practices in Grades 9-12.” Participants will be introduced to a “3-step process” to develop sets of tasks that can build procedural fluency.
Melissa Boston, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Duquesne University, Ellwood City, Pennsylvania
Twitter: @MBostonMath
Friday Afternoon Sessions

224  Math for Social Justice: One District’s Approach to Third/fourth Year Math Course
10–12 Session
Baltimore Convention Center, 316
This new course, currently being piloted, was created with the goal of addressing 3rd/4th-year math content through use of the math practices and inquiry into social issues including identity, biases in data, and environmental justice. We will share our course design and ways to encourage students’ development of mathematical identity and agency.
Jenny Sagrillo, University of Wisconsin-Milwaukee
Twitter: @jsagrillo
Mary Zietlow, Milwaukee Public Schools, Wisconsin
Joan Masek, Milwaukee Public Schools, Wisconsin
Laura Sizemore-Williams, Milwaukee Public Schools, Wisconsin
Kevin Schiebenes, Milwaukee Public Schools, Wisconsin

225  Students are Decision Makers: Our PBL Story.
10–12 Session
Baltimore Convention Center, 310
Engage in a trigonometry problem-based learning activity and examine students’ decision-making process. Instructional supports include encouraging persistence and autonomy. PBL activities are STEM contextualized and evoke students’ prior knowledge. Students engage in sense-making and examine if their solution process is mathematically correct.
Nicola Edwards, Delaware State University, Dover
Delayne Johnson, Delaware State University, Smyrna

226  It’s Not Just a Routine
Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 303
Join us in trying 5 mathematical routines you can use in your classroom to provide increased opportunities for discourse. Students will build agency and identity as they share their thinking and justify their solutions. Teachers gain additional formative assessment knowledge about their students as they listen and interact during the routines.
Jay Sydow, Lexington School District One, South Carolina
Twitter: @SydowJay
Fred Dillon, Fred Dillon, Strongsville, Ohio

227  Dynamic Doubles with Web Sketchpad (WSP): Double Number Lines and Dynagraphs
General Interest Session
Baltimore Convention Center, Ballroom 1
Participants will learn how elementary students can use double number lines with Web Sketchpad to explore ratio, multiply and divide fractions, and develop proportional reasoning. At the secondary level, the number line modeling progresses to dragging variables along a dynagraph to experience rate of change, covariation, and domain and range.
Scott Steketee, National Science Foundation, Philadelphia, Pennsylvania

228  Responding to Social Crises in the Classroom
General Interest Session
Baltimore Convention Center, 317
Sometimes curriculum needs to be set aside to help process a current event. Assisting students and teachers in approaching highly charged events can be elevated when applying a mathematical lens. Our goal is to help learners use a mathematical lens to move from emotion to action. We will showcase a procedure for giving students a voice.
Nichole Campbell, Saint Paul Public Schools, Andover, Minnesota
Twitter: @ncampbell_math
Stacy Waskosky, St. Paul Public Schools, Minnesota
Peggy Nayar, Woodbury, Minnesota

228.1  Leveraging Computer Algebra Systems as a Tool for All Students to Explore Mathematics
8–10 Exhibitor Workshop
Baltimore Convention Center, 336
What if there was a technology tool that could make exploring mathematical properties, patterns, and relationships into inquiry activities? Join us as we explore examples from Algebra through Calculus that demonstrate using CAS as a tool for discovery. Bring a laptop to download free software and create lessons in this “make and take” session.
Texas Instruments, Sacshe, Texas

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
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Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
Join the National Council of Teachers of Mathematics in Washington, DC, October 25-28, 2023 for the NCTM 2023 Annual Meeting & Exposition.

Preview the conference strands:

- Uplifting and Inspiring the Mathematics Educator
- Creating Inclusive, Engaging, and Rigorous Mathematics for All
- Challenging and Advancing Policy and Structures in Mathematics Education
- Expanding the Narrative of Who Belongs
- Improving Core Instruction through Deeper Mathematical Content and Pedagogical Knowledge
Friday Afternoon Workshops

1:00 p.m.–2:15 p.m.

229  Bansho: Sequencing Concrete-Representational-Abstract Strategies
PreK–2 Workshop
Baltimore Convention Center, 339–340
Bansho is a strategy for organizing, documenting, and making mathematics vocabulary, learning, and strategies visible. Bansho, or Japanese board writing, emphasizes the comparison of CRA strategies to synthesize big ideas. Come see how Bansho can engage PreK–1st students in moving from concrete to representational to abstract strategies.
Kateri Thunder, Math+Literacy, LLC, Charlottesville, Virginia
Twitter: @MATHplusLIT
Hollins Mills, Albemarle County Public Schools, Charlottesville, Virginia

230  A Writing Process for Math? Yes!
3–5 Workshop
Baltimore Convention Center, 308
The Mathematical Writing Process (MWP) is an innovative approach to help elementary students’ advance their abilities to write mathematically by talking, sharing, and getting feedback on their writing. Come participate in the MWP and walk away with insights to design your own lessons to support students’ development as mathematical writers.
Tutita Casa, University of Connecticut, Storrs Mansfield
Madelyn Williams-Colonnese, University of North Carolina Charlotte
Janine Firmender, Saint Joseph’s University, Philadelphia, Pennsylvania
Fabiana Cardetti, Storrs, Connecticut

231  Games that Promote Equity and Mathematical Brilliance in the Upper Elementary Classroom
3–5 Workshop
Baltimore Convention Center, 327
Playing games in math class can be more than just “fun”! Games can provide opportunities to enhance access to content, delve deep into mathematical ideas and strategies, and affirm students’ mathematical identities. This session will look at how we can evaluate games that promote equity while pushing mathematical thinking forward. Let’s play!
Louisa Connaughton, BB&N School, Belmont, Massachusetts
Twitter: @ljconnaughton
Jenna Laib, Brookline Public Schools, Medford, Massachusetts

232  Data-Sleuthing the COVID-19 Effect: Using Proportional Reasoning to Explore Racial Disparities
6–8 Workshop
Baltimore Convention Center, 349–350
Join an investigative team to study COVID-19 data across racial subgroups. Comparing COVID-19 percent data to Census figures, participants use proportional reasoning to visually and numerically represent their team’s findings. Using a gallery walk and statistical criteria, disparities are identified and next steps with students are discussed.
Mary Leer, Bank Street Graduate College of Education, New York, New York
Dawoun Jyung, Metropolitan Expeditionary Learning School, Forest Hills, New York

233  Moving from Do Now to Think Now! Leveraging Tools and Strategies to Achieve Specific Engagement
6–8 Workshop
Baltimore Convention Center, 307
How do you start class? Homework review? A “Do Now” question? Does this actively, specifically engage the thinking minds of your students, or does it just fit into a section of the lesson plan template? This hands-on tech session will connect resources and understandings to engagement and cognitive activation to generate thinking in your students.
Denis Sheeran, Montclair State University, New Jersey
Twitter: @MathDenis NJ

234  Teaching About Our World with Mathematical Models and Manipulatives
6–8 Workshop
Baltimore Convention Center, 337–338
In this interdisciplinary workshop discover activities that bring current events and top global challenges into the math classroom. Explore trends in the environment, global population and more using models, manipulatives and lively group work that build middle school math skills while exciting students about math connections to their lives.
Carol Bliese, Population Connection, Washington, District of Columbia
Twitter: @PopulationEd
Katie Grams, Population Connection, Washington, District of Columbia

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
235  Using Data to Probe Representation and Equity
6–8 Workshop
Baltimore Convention Center, 315
What role can data play in probing power & representation? As we strive for equity and justice, it is more important than ever that we interrogate the systems around us & consider who these systems are designed to benefit & oppress. In this workshop, we will explore the impacts of inviting our learners to look at data through a social justice lens.
Riana Fisher, Sacred Heart Catholic School, Washington, District of Columbia
Elise Heil, Sacred Heart Catholic School, Washington, District of Columbia

236  Algebra Tiles: Building Conceptions of Polynomials through Manipulatives
8–10 Workshop
Baltimore Convention Center, 343–344
How can all learners develop meaningful conceptions of algebra concepts? Engage in hands-on activities with algebra tiles, learning how these manipulatives can be used to support students’ conceptualization of polynomial operations, factoring, and completing the square.
Amy White, Houston ISD, Texas
Twitter: @awhitemath

237  Fun Functions: Interesting Function Activities that Highlight the Mathematical Practices
8–10 Workshop
Baltimore Convention Center, 314
Participants will experience several activities concerning functions: 1) using a human graph to explore functions, domain/range, and asymptotes, 2) function machines, 3) a silent board game, and 4) transformations of parent graphs. The session ends with a Function Treasure Hunt. The CCSS Mathematical Practices will be processed throughout.
Marcus Blakeney, CPM Educational Program, Louisville, Kentucky
Twitter: TheOneDoesMath

238  Game On! Captivating Games for the Algebra I Classroom
8–10 Workshop
Baltimore Convention Center, 347–348
Experience the power of games in the classroom. This workshop will take participants through several games that help students understand topics such as factoring quadratics, probability, slope-intercept, and data analysis. Participants will have the opportunity to play the games and discuss the use of them in their classrooms.
Nora Oswald, Jim Thorpe School District, Pennsylvania
Twitter: Nora Oswald

239  Lab Calculus: Graphical and Numerical Approaches to Problem Solving
10–12 Workshop
Baltimore Convention Center, 324–326
Engage in rich investigations that focus on foundational aspects of calculus while prioritizing visualization, writing for understanding, and numerical methods over symbolic solutions. Collaborate on these labs from a year-long, non-AP course as we jump into extreme skydiving, see how to quantify income inequality, and ride the Tilt-a-Whirl!
Kevin Bartkovich, Phillips Exeter Academy, New Hampshire

240  The History of Math through an Anti-Racist Lens
10–12 Workshop
Baltimore Convention Center, 322–323
Participants will learn about non-European roots of mathematics, participate in non-European mathematics, and discuss how to integrate these topics into the classroom as part of an effort to rehumanize mathematics learning for students of color.
Michele Nieves, Newton Public Schools, Massachusetts

241  Designing a Path to Equitable Mathematics Discussions through Innovative Approaches to Coaching
Coaches/Leaders/Teacher Educators Workshop
Baltimore Convention Center, 301–302
Simulations are an increasingly popular approach for teachers to practice. In this workshop we will engage with digital clinical simulations designed by a district math coach. Participants will experience how the coach used simulation in her school for teacher professional education and discuss implications for further practice and research.
Dr. Gregory Benoit, Boston University Wheelock College of Education, Massachusetts
Twitter: @DrGBenoit
Renee Lewis, Boston Public School, Massachusetts
Erin Barno, Boston, Massachusetts
242 Using Counting Collections to Teach Subitizing and Flexibility With Numbers

PreK–2 Session
Baltimore Convention Center, 317
Participants will learn the many benefits of using counting collections with young mathematicians. Through hands-on activities, participants will explore the ways that counting objects can support both perceptual and conceptual subitizing and lays the foundation for students’ ability to use numbers flexibly.

Diane Messer, School District of Philadelphia, Pennsylvania

243 Strategies for Teaching Fractions for Understanding: You Can Do This!

3–5 Session
Baltimore Convention Center, 318–321
Come explore multiplying and dividing fractions. We’ll learn strategies to simplify this process as well as develop an understanding of what is actually happening when we multiply and divide fractions. The standards for mathematical practice are habits of mind that we want for our students but come see how they can also promote SEL competencies.

Lori Mueller, Great Prairie Area Education Agency, Burlington, Iowa
Twitter: LoriMue313

244 Hey! This Graph Isn’t Telling Me Anything! Hiding Information on Graphs to Build Critical Reasoning

6–8 Session
Baltimore Convention Center, 341–342
Session focuses on helping students understand how a graph’s labels/categories are essential in interpreting and predicting data. Participants will be shown how to remove information to open up the graph, allowing students to suppose, propose and re-imagine ways to present and understand data. Presentation includes many examples and demonstration.

Jeremy Anne Knight, Jefferson County Schools, WV, Charles Town, West Virginia
Twitter: @jeremyannemath

245 Grading for Equity

8–10 Session
Baltimore Convention Center, 319–320
How do we as educators make grading equitable? How do we accurately and honestly report to our students their level of understanding? Standards based grading; 100% of grades coming from assessments; unlimited retakes; and rough draft quizzes are among the ideas we will investigate as we examine as we learn how to “grade for equity”.

Chris Anspach, Sonoma Valley Unified, Petaluma, California

246 Differentiated Teacher Support: A Session for Coaches

Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, Ballroom 2
Using trajectories of teacher change on topics such as questioning, kid-watching and use of representation, we will explore how coaches can provide differentiated teacher support. Using these trajectories while analyzing classroom video, coaches will have tools to support all of their teachers from where they are and provide appropriate challenges.

Ryan Dent, New Perspectives Online, LLC, New London, Connecticut
Twitter: @CFLM_Math
Sharon Askew, New Perspectives on Learning, LLC, New London, Connecticut

247 Empowering All: A Multi-Level Approach to Support Student Achievement via Educational Communities

Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 310
At the instructional core of what we do in math is student achievement and success. Yet, many events threaten the core we aim to preserve. Come experience how a large urban district used the lens of student success to develop a multifaceted approach to foster math understanding and build the math capacity of all parties by creating communities.

Karen Riley Jeffers, Prince George’s County Public Schools, Bowie, Maryland
Twitter: @Karen_RJeffers
Dr. Esau Chip Foster, Prince George’s County Public Schools, Oxon Hill, Maryland
Donicka Herod, Prince George’s County Public Schools, Oxon Hill, Maryland
Marcia Sun, Prince George’s County Public Schools, Oxon Hill, Maryland
Carlene Young, Prince George’s County Public Schools, Oxon Hill, Maryland

2:30 p.m.– 3:30 p.m.
Friday Afternoon Sessions
248 Expanding the Frontiers of Math Class
Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 316
Do you want math class to feel more energizing and memorable? Would you like to help improve the quality of American discourse? By using math as a lens to explore authentic issues in the world, you can turn your classroom into a forum for life’s most interesting conversations. You can help students think critically about real issues and discuss them thoughtfully and respectfully. Mathematics is bigger than we’ve traditionally defined it. So are you.
Karim Ani, Citizen Math, Austin, Texas
Twitter: karimkai

249 Tackling the Academic Achievement Gap: Applying Research to Practice in School Improvement
Coaches/Leaders/Teacher Educators Session
Baltimore Convention Center, 309
This presentation will cover how to apply research to school improvement planning efforts. These efforts include setting specific mathematics goals for historically marginalized student groups, identifying the appropriate action steps, and how to monitor the effectiveness of these action steps in meeting the goals of the school improvement plan.
Rebecca Barnes, Anne Arundel County Public Schools, Glen Burnie, Maryland

250 Implementing Equitable Grading Practices in the Math Classroom
General Interest Session
Baltimore Convention Center, 329
Looking for equitable grading practices to align with your equitable teaching practices? One math team will share their journey towards effective, equitable, and transparent grading practices. Participants will receive grading frameworks, standards-based rubrics, and other tools that can be implemented immediately in the classroom.
Alycia Donati, Howard County Public School System, Ellicott City, Maryland
Twitter: @alycia_donati
Charlene Linkous, Howard County Public School System, Ellicott City, Maryland
Chris Ryals, Howard County Public School System, Ellicott City, Maryland
Stacey Spanier, Howard County Public School System, Ellicott City, Maryland

251 Inclusion: A Deep Dive into Equity in the Mathematics Classroom among General and Special Educators
General Interest Session
Baltimore Convention Center, 303
Imagine a math class where two educators share an equal part in the math instruction and special support for all students in the classroom. What does that look like? Why do so many of us think it’s too difficult to achieve? Come to this session to explore ideas for tweaking your practices to maximize everyone’s role in the math inclusion classroom.
Janet Varner, St. Mary’s College of Maryland, California
Twitter: Janet Wood Varner

6–8 Exhibitor Workshop
Baltimore Convention Center, 336
By the end of the school year, students have already forgotten many of their hard-won math concepts. How can we break the forgetting cycle and make math stick? In this session, veteran math teacher Josh Britton will share his proven model for driving long-term retention through use of Get More Math software.
Get More Math!, Sonora, California

251.2 Solving the Fractions Problem: From Research to Classroom
3–5 Exhibitor Workshop
Baltimore Convention Center, 328
Fractions knowledge by grade 5 uniquely predicts success in higher mathematics. Yet, tests show that it’s a struggle for many from grade 3 on. Fortunately, new research is finding instructional strategies that work. Join us to explore how applying an adaptive, game-based technology can help more students succeed.
ExploreLearning, Charlottesville, Virginia

2:30 p.m.– 3:30 p.m.
Friday Afternoon Sessions

Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
Friday Afternoon Workshops

2:45 p.m.–4:00 p.m.

253 Equity and Access Through Counting Collections: K-2
PreK–2 Workshop
Baltimore Convention Center, 327
Young mathematicians are motivated by the challenge of organizing, counting, and representing collections. This session introduces counting collection trajectories, formative assessment tools that allow elementary teachers to understand and advance student thinking in grades PK-2.
Janelle Duckett, Great Minds, Washington, District of Columbia

254 Structures, Tools, and Routines that Integrate Social-Emotional Learning and Mathematics
3–5 Workshop
Baltimore Convention Center, 347–348
This interactive session engages educators in doing, analyzing, and reflecting on mathematical experiences as they discover answers to these questions: What is social-emotional learning? How does it connect to teaching and learning math? Why does the integration of this learning matter? And how can I create integrated experiences for my students?
Loryn Lenartowicz, Curriculum Associates, Oakland Park, Florida
Twitter: @llenartowicz
Laura Grandau, Highland Park, Illinois

255 Applied Mathematics Mentorship Program: Applied Math Investigations for Grades 7 and 8 and Algebra 1
6–8 Workshop
Baltimore Convention Center, 349–350
We will share information about our Applied Mathematics Mentorship Program, which places middle school and algebra 1 students on research teams investigating math problems in their community and beyond. Participants will also experience one activity. The UCLA Curtis Center was awarded a Bill and Melinda Gates grant to develop these investigations.
Michelle Welford, UCLA, Chestnut Hill, Massachusetts

256 Equity in Mathematics through SEL and Culturally Responsive Mathematics Teaching
6–8 Workshop
Baltimore Convention Center, 343–344
Imagine walking into a room feeling uninvited and out of place. Unfortunately, this reality is confronted by many learners entering mathematics classrooms nationwide. Join our workshop as we uncover opportunities to establish equitable mathematics learning spaces where all students feel welcomed and empowered as thinkers and doers of mathematics.
Tandrea Fulton, University of Central Florida, Sanford
Twitter: Tandrea Fulton
Treshonda Rutledge, University of Central Florida, Clermont

257 Building Community in the Mistake Friendly Classroom
8–10 Workshop
Baltimore Convention Center, 322–323
The purpose of this presentation is to help teachers build strong relationships with students and promote student engagement. Teachers will explore how to embed error analysis into daily instruction to strengthen student critical thinking and decision making skills.
Ashley O’Malley, Hampton City Schools, Virginia
Twitter: @alynn_math
Pamela Nazareth, Hampton City Schools, Virginia
Carol Queen, Hampton City Schools, Virginia

259 Igniting Curiosity: Engaging Students in the Cycle of Inquiry and Justification
8–10 Workshop
Baltimore Convention Center, 307
Engaging students in the cycle of inquiry and justification has the potential to ignite curiosity and develop mathematical agency in ways that show-and-tell approaches to reasoning and proof do not. We explore this cycle within the instructional practice of proving theorems in geometry, providing attendees with concrete ideas for their classrooms.
Casey Griffin, University of Delaware, Newark
Twitter: @crgrif8
Michelle Cirillo, University of Delaware, Newark
Amanda Seiwell, Magnolia, Delaware
James Fitzhugh, Bear, Delaware

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Ignite Your Awareness: Integrating Social-Emotional and Academic Learning
Ignite Your Community: Partnering to Plan and Support Success for Students
Ignite Students’ Engagement with the Mathematical Practices: Promoting Joy in the Classroom
Ignite Your Power: Lifting Up Each and Every Person
Ignite Student Learning: Capitalizing on the Formative Assessment Process
### Friday Afternoon Workshops

**2:45 p.m.– 4:00 p.m.**

**260** Building Mathematical Identity in an Inclusion Class with the Thinking Classroom, Rich Tasks, & PBL

*10–12 Workshop*

Baltimore Convention Center, 301–302

We implemented the ‘Thinking Classroom’ in a inclusion NYC, project-based, alternative school, and had success! Come learn how this model found it’s way to our school, and shifted how our students think about math. Leave with strategies for addressing special ed needs, assessment strategies for project based learning, and a folder of tasks.

**Carl Oliver,** City As School, Brooklyn, New York  
Twitter: Carl Oliver

**261** Re-Igniting Students’ Curiosity Through Questions

*10–12 Workshop*

Baltimore Convention Center, 308

Years of classroom research suggests that it is teachers, not students, who ask most of the questions in classrooms. Yet asking questions is essential to developing mathematical habits of mind and other STEM skills. A classroom routine designed to re-ignite students’ curiosity as well as ideas for using it to teach mathematics will be explored.

**John Pelesko,** University of Delaware, Landenberg, Pennsylvania

**262** The Heart of Math: Exploring Math with One-Cut Origami

*10–12 Workshop*

Baltimore Convention Center, 314

Where is mathematics behind interesting and fun origami activities? Come join our session to make origami hearts with one straight cut. Also, you will learn how to actively engage students in making, explaining, exploring, and discovering diagrams, as well as strengthen their reasoning of mathematical concepts using origami activities.

**Yi-Yin (Winnie) Ko,** Indiana State University, Terre Haute  
**Connor Goodwin,** Indiana State University, Terre Haute  
**Drew Daner,** Indiana State University, Terre Haute  
**Lauren Ream,** Indiana State University, Terre Haute  
**Grace Rebber,** Indiana State University, Terre Haute

**263** Thinking Classroom in Calculus

*10–12 Workshop*

Baltimore Convention Center, 324–326

Our Calculus team went all-in on Peter Liljedahl’s Thinking Classroom model last year; we didn’t “give notes” once. Students loved it, and we did, too! We’ll share a couple of our favorite lessons, as well as our overall approach to adapting lessons to this format.

**Beth Stafford,** Georgetown Day School, Washington, District of Columbia  
**Thomas Spilsbury,** Georgetown Day School, Washington, District of Columbia

**264** Count Me In: Strategies for Shaping (and Reshaping) the Math Identities of Elementary Educators

*Coaches/Leaders/Teacher Educators Workshop*

Baltimore Convention Center, 339–340

Did you know that nearly 1 in 4 teachers suffers from math anxiety? This workshop introduces strategies for overcoming anxiety and shaping the mathematics identities of preservice and in-service educators. Participants will engage in activities that explore identity, promote collaboration, and allow for creativity in “doing mathematics.”

**Kathryn Brave,** Towson University, Maryland  
Twitter: @lavinbrave  
**Ming Tomayko,** Towson University, Maryland

**59** NCTM Regional Conference & Exposition  
**Baltimore • November 30 – December 2, 2022**
NCTM FOCAL AREAS

- Productive Struggle (PK–2, 3–5, 6–8, 9–12)
- Facilitating Discourse (PK–2, 3–5, 6–8, 9–12)
- Algebra Readiness (6–8)
- Making Mathematics Accessible (4–8)
- Building a System of Tens (K–8)
- Making Meaning for Operations (K–8)
- Measuring Space in Dimensions (K–8)
- Orchestrating Productive Discussions in Math Classrooms (6–8)
- Catalyzing Change in Middle School Mathematics (6–8)

NCTM School and District Workshops Deliver Powerful Learning

NCTM Professional Learning Services offers a wide range of customized, evidence-based professional learning opportunities designed for teachers and school teams.

NCTM workshops are available for in-school or remote learning to help expand teachers' understanding of mathematics concepts, develop effective instructional strategies, and positively affect student learning outcomes.

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NCTM Professional Learning Solutions offers a wide range of customized, evidence-based professional learning opportunities designed for teachers and school teams.

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- Measuring Space in Dimensions (K–8)
- Orchestrating Productive Discussions in Math Classrooms (6–8)
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**Affiliate Information**

**Join an NCTM Affiliate Today**

Once you have joined NCTM, membership in an NCTM Affiliate is a terrific way to round out your professional involvement. Affiliates offer you an additional opportunity to connect with teachers in your state, region, or city for support, professional development opportunities, community outreach, political advocacy, and information sharing.

A list of Partner Affiliates in the conference region and the Affiliates-at-Large follows. To join one of these organizations, email the Affiliate contact for membership information. NCTM has Affiliates throughout the United States and Canada.

For a list of all organizations affiliated with NCTM and information on how to join, visit the Affiliate Directory at [nctm.org/Affiliates/Directory](http://nctm.org/Affiliates/Directory).

**About the Host Organization**

The **Maryland Council of Teachers of Mathematics (MCTM)** is the state-affiliate of the National Council of Teachers of Mathematics (NCTM). The Council’s rich history dates back to over 100 years ago, with a group of educators that called themselves the Association of Teachers of Mathematics of the Middle States and Maryland. This group of dedicated professionals met regularly and published a professional journal called *The Mathematics Teacher*, which is now published by the National Council of Teachers of Mathematics and widely read by thousands of teachers worldwide.

In 1933, that group became one of the NCTM’s earliest affiliates and called themselves the Maryland Council of Teachers of Mathematics (MCTM). **MCTM is a public voice of mathematics education, inspiring vision, providing leadership, offering professional development, and supporting equitable mathematics learning of the highest quality for all students.** The Council’s members represent all levels of mathematics educators, from preschool through college.

**Affiliates-at-Large**

- Adult Numeracy Network
- Association of Mathematics Teacher Educators
- Association of State Supervisors of Mathematics
- Benjamin Banneker Association, Inc.
- Council of Presidential Awardees in Mathematics
- NCSM Leadership in Mathematics Education
- North American Study Group on Ethnomathematics
- Society of Elementary Presidential Awardees
- TODOs: Mathematics for ALL
- Women and Mathematics Education

Search the NCTM affiliate directory for contact information for "Affiliates-at-Large." [nctm.org/Affiliates/Directory](http://nctm.org/Affiliates/Directory)
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NCTM wishes to thank our 2022 Baltimore Regional Conference Committees for their generous support and dedication planning this Regional Conference.

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3) ELECTRIC PORTS ARE RAISED 4-5IN ABOVE FLOOR.
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5) FIRE ALARM PULL BOX
6) AIRWALL BETWEEN EXHIBIT HALLS
7) 16'-6" CEILING HEIGHT
8) 15'-6" CEILING HEIGHT
9) 14'-6" CEILING HEIGHT
10) 11'-5" CEILING HEIGHT
11) OPERABLE WALL
12) SECTION AT A TYPICAL EXHIBIT HALL CEILING
13) SLANTED CEILING FROM 18'-0" TO 31'-0"
14) 18'-0" CEILING HEIGHT
15) 29'-0" CEILING HEIGHT
16) SLOPED CEILING FROM 18'-0" TO 31'-0"
17) 18'-0" CEILING HEIGHT
18) 29'-0" CEILING HEIGHT
19) SLOPED CEILING FROM 18'-0" TO 31'-0"
20) 18'-0" CEILING HEIGHT
21) 29'-0" CEILING HEIGHT
22) SLOPED CEILING FROM 18'-0" TO 31'-0"

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ASSISTments solutions multiply your school’s impact with data-driven formative assessment solutions. ASSISTments Teacher is a FREE evidence-based math intervention; backed by rigorous research and funded by the DoE. We are a digital math solution that addresses unfinished learning, saves teachers time, enhances math curricula, and accelerates student learning up to 75%. Learn more about how we help teachers and districts create supportive and successful equitable math classrooms in booth 117!

BirdBrain Technologies
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BirdBrain Technologies cultivates creativity and makes abstract concepts hands-on by designing flexible and inspiring classroom tools: the Finch Robot, the Hummingbird Robotics Kit, and the new Owlet Math Tools collection for K-5.

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NewPerspectivesOnLearning.com
New Perspectives now offers a full core k-5 program with 10-12 units per grade, an online professional learning and support system for teachers, and a related formative assessment tool. We also offer on-site support for coaches and teachers in the form of in-class work, online learning communities, and face-to-face workshops. Come to the booth for a preview of all our new units, online tools, and our digital assessment package. See what curriculum for the 21st century can look like.
Center for Mathematics and Teaching, Inc.
Booth 512
Redondo Beach, CA
mathandteaching.org
Transition to the Common Core with the Center for Mathematics and Teaching. We provide engaging, student-centered programs for middle school students and professional development for teachers.

CPM Educational Program
Booth 218
Elk Grove, CA
cpm.org
CPM offers grades 6-12 mathematics textbooks that use problem based learning in student centered classrooms and supports it with funded professional development. The Core Connections series (c) 2013-2015 is 100% aligned with CCSS content and practices. High school books offer both traditional and integrated pathways. Visit our booth and receive free access to the curriculum.

Curriculum Associates
Booth 611
North Billerica, MA
CurriculumAssociates.com
Curriculum Associates serves millions of students with a laser focus on educators’ needs and the belief that thoughtful, continuous innovation leads to positive impact on classrooms and measurable growth for students.

Didax Inc
Booth 818
Rowley, MA
didax.com
For years Didax has been producing innovative resources for math education professionals. We provide a many manipulatives including our hallmark product, Unifix® Cubes. In addition, we develop other hands-on resources, games, and activity books. We’re proud to partner with Great Minds as the exclusive provider of Eureka Math kits. We’re excited to publish Didax PD featuring online courses for math instructors.

EAI Education
Booth 713
Oakland, NJ
eaieducation.com
EAI Education is a leading manufacturer of hands-on resources for PreK-12 Math, Literacy, and STEM. Our innovative products include Bar Models, Visual Area Modelers, SmartPals, Fraction Fluency and Exploragons®. We offer student manipulative kits, along with custom classroom manipulative kits for your curriculum needs. Stop by booth to view our newest products!

EdLight
Booth 714
Melrose, MA
edlight.com/
EdLight makes it easy to digitize the authentic work that students do in the real world, on paper. Teachers can score, share, and sort student work from any device, anywhere.

ExploreLearning
Booth 514
Charlottesville, VA
explorelearning.com
ExploreLearning® creates seriously fun ed tech solutions for the most critical challenges in K-12 STEM learning. Effective and fun, our programs help students not only succeed at math and science, but also love it as much as we do. Learn more about Gizmos®, Reflex®, Frax® and Science4Us® at www.explorelearning.com.

George Mason University
Booth 113
Fairfax, VA

Get More Math!
Booth 615
Quarryville, PA
getmoremath.com
Will a student retain new concepts next week — or next year? Get More Math is designed by a math teacher to ensure that the answer is: yes! Take practice to the next level with on-demand spiraled review that builds proficiency on newer content and maintains previous content gains. Real-time data for just-in-time intervention. The Exams feature makes every assessment actionable. Accelerate learning as never before with a complimentary site-license lasting through July 31 for qualifying schools.

Great Minds
Booth 511
Washington, DC
greatminds.org
Eureka Math® is a revolutionary math program designed to advance equity in the math classroom by helping students build enduring math knowledge. You’ll still find the consistent math models, rigor to support the productive struggle, and coherence across grades that premiered in Eureka Math®, but exponentially greater. You’ll also find digital interactives, increased opportunities for student discourse, and a new level of flexibility to make math instruction more teachable and engaging.

hand2mind, Inc.
Booth 513
Vernon Hills, IL
hand2mind.com
Children learn best by doing! Visit our booth to learn more about hand2mind’s most-loved programs and manipulatives. Discover simple, standards-based solutions to integrate hands-on learning into your classroom for Daily Math Fluency, Differentiated Math Instruction, Guided Math Lessons, and more. Learn about fun, new ways to use the hand2mind manipulatives you already have in your classroom and get a sneak peek at exciting new products, too.
Heinemann Publishing
Booth 721
Portsmouth, NH
heinemann.com/math

Heinemann math resources are written by educators, for educators, to support student-centered teaching and learning. Our authors start with curiosity about students’ thinking and numerical reasoning. By learning about student understanding, teachers can be responsive to individual needs. The goal of our resources is to elevate teacher expertise, increase their comfort and confidence with math, and provide support for helping students make sense of the math they’re learning. www.Heinemann.com

I Know It
Booth 118
Tonawanda, NY
iknowit.com

I Know It math is a comprehensive, interactive math practice site (levels K to 5) for elementary students and for middle/high school students as an intervention program. This online resource can be used during class or at home for independent practice, remediation, assessment, or homework. The site enables teachers & parents to differentiate assignments for students, allowing them to work at their own level & pace towards mastery of concepts and skills aligned with national and state standards.

Legends of Learning
Booth 711
Washington, DC
legendsoflearning.com

Legends of Learning creates standards-aligned digital games to foster deeper engagement, increase content retention and increase test scores; all backed by research from Vanderbilt University. We have over 2,000 standards-aligned games supporting K-8 math and science instruction, so teachers can personalize learning to meet all students where they are. Use Legends to integrate an exciting game-based learning platform into your curriculum to give your students the superpower of knowledge!

Kendall Hunt Publishing Company
Booth 516
Dubuque, IA
k12.kendallhunt.com

Kendall Hunt is the provider of educational products for math, science and talented and gifted for grades K-12. Full core curriculum math offerings include Illustrative Mathematics for K-12, the Discovering Mathematics Series (Discovering Algebra, Discovering Geometry and Discovering Advanced Algebra) as well as advanced mathematics offerings PreCalculus, Calculus and Statistics. A wealth of supplemental math offerings are also available for all grade levels.

KnowRe
Booth 417
New York, NY
knowre.com

Knowre Math supports the needs of all students. We know teachers can’t be with every student all the time, so Knowre Math is designed to meet students where they are with 1-on-1 support modeled after the way teachers help students. Knowre Math is designed for teachers by teachers. Our Dashboard delivers actionable data and insights, access to flexible, standards-aligned math curricula, and technology that saves time. At Knowre we understand students don’t hate math, they hate being frustrated.

Link-Systems International, Inc.
Booth 817
Tampa, FL
link-systems.com

Link-Systems International (LSI) provides online learning services that support educators to build student confidence, ensure academic progression, and restore human connection. LSI has provided effective and intuitive online learning solutions that help students confidently progress in the classroom and beyond since 1996. Every student deserves meaningful learning opportunities to fulfill their academic goals. Let’s discuss how Sofia and NetTutor may support your students’ goals!

Magma Math
Booth 510
Palo Alto, CA
magmamath.com

Magma Math has its roots in the Nordics and offers an innovative digital math platform with an aligned curriculum in the K-12 space. The platform combines the power of handwriting with the advantages of digitalization to enhance communication and collaboration, provide real-time student data, and make formative assessment a natural part of math class. Magma Math is on a mission to provide equitable, accessible, and engaging math education to revolutionize the learning journey for all students.

Math Is Money
Booth 717
Murfreesboro, TN
MathisMoney.Net

Math is Money is a youth financial education program designed to teach assets, liabilities, owning property, starting a small business, stocks, dividends, long-term investing, and building generational wealth.

MATHCOUNTS Foundation
Booth 715
Alexandria, VA
mathcounts.org

MATHCOUNTS provides fun and engaging programs for 6th, 7th and 8th grade students. Through 3 programs—the MATHCOUNTS Competition Series, the National Math Club and the Math Video Challenge—we strive to foster talent, curiosity and a love of math in all students. Stop by the MATHCOUNTS booth to register for the National Math Club for free!

Math Is Money
Exhibitor Directory

Mathnasium, The Math Learning Center
Booth 114
Los Angeles, CA
Mathnasium.com

Mathspace
Booth 815
New York, NY
mathspace.co
Mathspace is a space to... LEARN FEARLESSLY Personalized learning and adaptive support encourages students to see mistakes as opportunities to grow. TEACH COMPREHENSIVELY Engage learners with interactive lessons. Differentiate instruction with adaptive tasks. Track student performance with built-in reporting. ASSESS EFFORTLESSLY Use the latest diagnostics to get the information you need on student growth, without taking time out of class. Learn more at: mathspace.co/us

National Geographic Learning | Cengage
Booth 210
Boston, MA
ngl.cengage.com
Your Learning | Your Future | Your World
At National Geographic Learning, a part of Cengage Group, we are enabling opportunity, powering progress, and supporting student journeys toward college and career. Using our digital learning programs and classroom learning resources, students experience the excitement and joy of learning that National Geographic explorers, scientists, writers, and photographers experience.

National Science Foundation
Booth 820
Arlington, VA
nsf.gov
The President of the United States recognizes outstanding teachers of mathematics and science (the elementary level in even-numbered years, and the secondary grade level in odd-numbered years) and bestows upon them the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST). Awards are given to teachers in each state, the District of Columbia, the Commonwealth of Puerto Rico, the Department of Defense Education Activity schools, and the U.S. Territories.

NCSM
Booth 812
Aurora, CO
mathedleadership.org
NCSM is a mathematics education leadership organization that equips and empowers a diverse education community to engage in leadership that supports, sustains, and inspires high quality mathematics teaching and learning every day for each and every learner. Our bold leadership in the mathematics education community develops vision, ensures support, and guarantees that all students engage in equitable, high-quality mathematical experiences that lead to powerful uses of mathematical understanding.

Origo Education
Booth 413
Earth City, MO
origoeducation.com
ORIGO Education covers all facets of elementary mathematics education: from traditional printed products to digital/interactive resources and professional learning. ORIGO Stepping Stones (aligned to CCSS) delivers a world-class mathematics program that seamlessly blends digital and print materials. ORIGO is committed to excellence by creating products that inspire and empower teachers & students. Our diverse selection of products bring a renewed enthusiasm to students' learning experiences.

Savvas Learning Company
Booth 710
Paramus, NJ
savvas.com
At Savvas, we believe learning should inspire. Our next-generation learning solutions, developed by top authors and educators, leverage the power of data and advanced technology to deliver immersive, personalized, and flexible content that connects teachers and students with real-world learning experiences, helping all learners discover their greatness. Visit us at savvas.com.

STEMscopes Math
Booth 518
Houston, TX
stemscopes.com/math
Discover the wonder of mathematics in our everyday world with STEMscopes Math, our all-new approach to math instruction. Built from the ground up by practicing educators using the flexible 5E lesson model, STEMscopes Math provides you with everything you need to create a meaningful learning experience that empowers your students with 21st-century skills to succeed in future STEM careers.

Stenhouse Publishers
Booth 110
Portsmouth, ME
stenhouse.com
Stenhouse provides quality classroom resources and professional development materials by teachers, for teachers. Visit booth 110 to learn about Building Fact Fluency: A Toolkit for Addition & Subtraction and Building Fact Fluency: A Toolkit for Multiplication & Division—two research-driven, engaging, ready-to-use resources—in your school to create cohesion in your math instruction by using common routines and formative assessment strategies that students will recognize across the grades.

TeacherMade.com
Booth 116
Fernandina Beach, FL
teachermade.com

Texas Instruments
Booth 411
Dallas, TX
education.ti.com
Designed by teachers for teachers, Texas Instruments calculators are dedicated tools built specifically for teaching and learning math, durable enough to withstand the demands of the classroom and distraction-free so that students stay focused on learning. Teachers trust TI calculators to help students succeed in class and on important exams.
Exhibitor Directory

The Actuarial Foundation
Booth 816
Schaumburg, IL
actuarialfoundation.org

The Actuarial Foundation supports mathematics achievement through an array of hands-on, real-world math resources. All of the lesson plans, materials, posters, online activities and competitions are free! www.actuarialfoundation.org The Foundation’s mission is to enhance math education and financial literacy through the talents and resources of actuaries. Our vision is an educated public in pursuit of a secure financial future.

The Math Learning Center
Booth 419
Salem, OR
mathlearningcenter.org

The Math Learning Center (MLC) offers innovative and standards-based materials for elementary classrooms. Bridges® in Mathematics, Number Corner®, and Bridges® Intervention are designed to develop mathematical confidence and ability not only in students but also in teachers. In support of our nonprofit mission we also offer a range of free resources, from math apps to free lessons and books for educators.

Third Space Learning
Booth 814
London, United Kingdom
thirdspacelearning.com/

Todos: Mathematics for All
Booth 810
Venice, CA
todos-math.org

MISSION The mission of Todos: Mathematics for All is to advocate for equity and high quality mathematics education for all students — in particular, Latina/o students. Todos’ goals include advancing educators’ knowledge and ability that leads to implementing an equitable, rigorous, and coherent mathematics program that incorporates the role language and culture play in teaching and learning mathematics and to develop and support educational leaders who continue to carry out the mission of Todos.

TouchMath
Booth 719
Colorado Springs, CO
touchmath.com

See It, Say It, Hear It and Touch It! TouchMath helps students of all abilities and learning styles master the foundations of math — from number sense to algebra — empowering them to achieve their full potential. Educators around the world rely on TouchMath for its proven strategies to maximize student potential, prepare for state tests, and achieve AYP benchmarks. Celebrate our 48th Anniversary and learn more about our expanded family of Special Education and Intervention products at booth 719.

WestEd
Booth 819
San Francisco, CA
wested.org

With rigorous college- and career-readiness standards like the Common Core State Standards for Mathematics, developing mathematic content knowledge and academic literacy is more important than ever for both teachers and students. WestEd’s curricula, books, and professional learning courses and workshops feature engaging, standards-based academic content, as well as instructional strategies that build academic literacy skills as an integral part of subject-matter learning.

Women and Mathematics Education
Booth 119
Philadelphia, PA
wme-use.org

The purpose of Women and Mathematics Education is to: • encourage women and girls to study and to have active to careers in the mathematical sciences; • promote equal opportunity and the equal treatment of women and girls in the mathematical sciences; • serve as a clearinghouse for ideas and resources in the area of women and mathematics; • promote leadership among women and girls in the broad mathematics education community; • conduct research in the area of women and mathematics.

Zaner-Bloser
Booth 111
Grandview Heights, OH
zaner-bloser.com

At Zaner-Bloser, we create tools for teachers that help students become more joyful and creative learners, thinkers, and communicators.

Zearn
Booth 612
New York, NY
about.zearn.org

Zearn is the 501(c)(3) nonprofit educational organization behind Zearn Math, the top-rated math learning platform used by 1 in 4 elementary-school students and by more than 1 million middle-school students nationwide. Everything we do is driven by the belief that every kid is a math kid. Free for teachers—always. Learn more and sign up at about.zearn.org.
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