PREMIER MATH EDUCATION EVENT

NCTM ANNUAL MEETING & EXPOSITION 2018 April 25-28 | Washington, DC

Program Book

See Valuable COUPONS beginning on page 233



THE FUTURE IS HERE



NCTM ANNUAL MEETING & EXPOSITION 2018 April 25-28 | Washington, DC

HOSTS

Maryland Council of Teachers of Mathematics Virginia Council of Teachers of Mathematics

MEETING FACILITY

All Annual Meeting presentations will be held at the Walter E. Washington Convention Center and the Marriott Marquis Washington DC. See pages 204–213 for floor plans.

REGISTRATION

Wednesday	8:00 a.m.	_	7:00 p.m.
Thursday	7:00 a.m.	_	5:00 p.m.
Friday	7:00 a.m.	_	5:00 p.m.
Saturday	7:00 a.m.	_	11:00 a.m.

EXHIBITS

Thursday	8:00 a.m.	_	5:00 p.m.
Friday	8:00 a.m.	_	5:00 p.m.
Saturday	8:00 a.m.	_	Noon

New this year! Dedicated exhibit hall time is scheduled from 12:00 p.m. to 1:30 p.m. on Thursday and Friday.

NCTM CENTRAL

Wednesday	10:00 a.m.	_	7:00 p.m.
Thursday	8:00 a.m.	_	5:00 p.m.
Friday	8:00 a.m.	-	5:00 p.m.
Saturday	8:00 a.m.	_	Noon



Advertisers Guide
Coupons
Affiliate Information
Certificate of Attendance
Delegate Assembly
Directory and Special Locations 209
Exhibits
Directory
Floor Plans
First Aid
Floor Plans
General Information
Information Booth
NCTM Central 6
Bookstore 7
Classroom Resources 6
Member Services 6
Mathematics Education Trust (MET)
Networking Lounge
NCTM Officers and Committees 203
Program Committee
Program Information
Annual Meeting Overview & Orientation 3
Grade Bands 3
Reflection Coves
Strands
Types of Presentations
Wednesday Presentations
Thursday Presentations
Friday Presentations 85
Saturday Presentations
Regional Caucuses
Registration
Research Conference
Shuttle Service
Speaker Index
Sponsors
Wi-Fi

nctm.org/annual2018

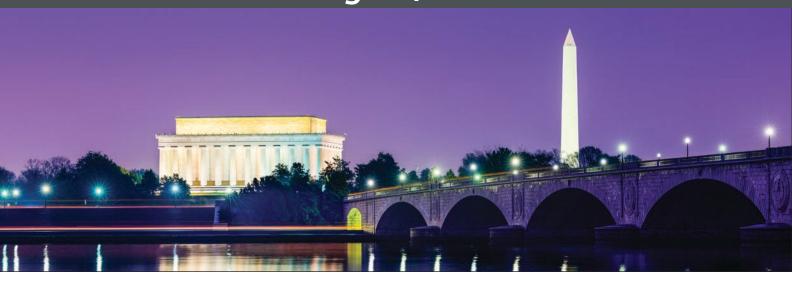
The publications and programs of the National Council of Teachers of Mathematics present a variety of viewpoints. The content, affiliations, and views expressed or implied in this publication, unless otherwise noted, should not be interpreted as official positions of the Council. References to particular 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

Some speakers on this program have elected to print their e-mail addresses as a means for individual correspondence with conference attendees. Unsolicited commercial e-mail or unsolicited bulk e-mail, whether or not that e-mail is commercial in nature, is expressly prohibited. Any use of e-mail addresses beyond personal correspondence is not authorized by NCTM.

National Council of Teachers of Mathematics, 1906 Association Drive, Reston, VA 20191-1502; Telephone (703) 620-9840; Fax (703) 476-2970; E-mail nctm@nctm.org; Web nctm.org.

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Welcome to Washington, D.C.!



Welcome to the NCTM 2018 Annual Meeting & Exposition! You're a part of the world's largest annual meeting for mathematics education, which brings together classroom teachers; school, district, and state mathematics education leaders; administrators; mathematics teacher educators; mathematicians; and researchers from around the world. You'll see and hear new ideas and approaches that you can take away to do your part to provide more and better mathematics for each and every student. We hope you'll connect with friends and colleagues—both new and familiar—to share ideas and information. The variety of our sessions, workshops, bursts, and networking opportunities will spark your imagination and send you back home energized to put what you've learned into practice. Our goal is for you to have the best professional learning experience possible and for you to leave Washington, D.C., with new ideas, tools, and materials to share with your students and colleagues alike.

If this is your first NCTM Annual Meeting, you're in for a professional treat. To make the most of the conference, be sure to attend one of the Annual Meeting Overview & Orientation sessions to familiarize yourself with everything that's available to you. Even veterans of NCTM conferences may want to

attend the orientation to learn about what's new at this year's conference. And whether you're a first-timer or long-timer, we want to call your attention to ShadowCon at 6:00 p.m. on Thursday, April 26. Because of its growing popularity and an overwhelming demand, for the past four years we've made it part of the NCTM Annual Meeting experience.

A conference this size depends on the work of hundreds of volunteers—many of them at the local level. We want to thank all of them. The Program Committee has been working for two years to put together a diverse program with presentations covering a wide range of topics. With hundreds of sessions to choose from, note especially the focus strands and the equity strand in the program. Preservice teachers and those in their first few years in the classroom will want to check out the special New Teacher strand with sessions designed to especially support those who are early in their careers. While you're here, be sure to take advantage of the Exhibit Hall, which gives you access to dozens of vendors who are willing and eager to talk to you about what they have to offer.

Wherever you go and whatever you do, enjoy your time in Washington, D.C.



Matt Larson President, National Council of Teachers of Mathematics; Lincoln Public Schools, Nebraska



Thomasenia Lott Adams *Program Committee Chair University of Florida, Gainesville*



Ed Nolan Host Affiliates Liaison Maryland Council of Teachers of Mathematics; Towson University, Maryland



Cathy Shelton Host Affiliates Liaison Virginia Council of Teachers of Mathematics; Fairfax County Public Schools, Virginia

Program Information

The NCTM 2018 Annual Meeting & Exposition officially begins with the Opening Session, starting at 5:30 p.m. on Wednesday, April 25, in Ballroom ABC at the Walter E. Washington Convention Center. Presentations on Thursday, Friday, and Saturday begin at 8:00 a.m. each day and are scheduled concurrently throughout the day at both the Walter E. Washington Convention Center and the Marriott Marquis Hotel.

We have made every attempt to offer adequate seating for participants at the Annual Meeting & Exposition. The room capacity for each presentation is listed on all meeting room signs. For your safety and because of fire regulations, only those with seats will be allowed in meeting rooms.

Please remember:

- All meeting rooms will be cleared between presentations.
- All seats are available on a first-come, first-served basis.
- Reserving spaces in line or saving seats is not permitted.
- In compliance with fire codes, sitting on the floor or standing is not permitted.
- As a courtesy to the speakers and your colleagues, please silence your cell phone during all presentations.

Annual Meeting Overview & 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.

Wednesday
Presentation #1
4:00 p.m.-4:30 p.m.
Salon C (Walter E. Washington Convention Center)

Thursday Presentation #3 7:15 a.m.–7:45 a.m.

Ballroom A/B (Walter E. Washington Convention Center)

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) allow speakers to convey information about multiple topics or broad ideas in lecture format. Rooms are set in either theater or classroom style.

Workshops (75 minutes) allow speakers to engage participants in an interactive environment. Rooms are set with round tables for interaction.

Bursts (30 minutes) allow speakers to quickly convey information on a specific topic or idea. Rooms are set with round tables.

Exhibitor Workshops (60 minutes) are set theater style. Exhibitors showcase their products and services. Look for the symbol windicating exhibitor workshops in the program book.

Reflection Coves

Highlighted and invited speakers will be assigned coves on the first and third floors of the Walter E. Washington Convention Center to continue the conversation from their sessions in an informal setting. You must be present at their sessions to receive information about the locations for these speakers.

When you review presentation titles and descriptions, be on the lookout for presentations tagged **REFLECTION COVE**. Take this opportunity to continue the discussion with these highlighted speakers

Cove Times 9:30 a.m.–10:30 a.m. 11:00 a.m.–12:00 p.m. 12:30 p.m.–1:30 p.m. 2:00 p.m.–3:00 p.m.

Grade Bands

To help you find appropriate presentations to attend, each presentation lists the presentation's target grade band audience:

- Pre-K-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)
- Coaches/Leaders/Teacher Educators
- General Interest—issues of interest to multiple grades and audiences
- Research

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 nursing mothers and their infants.

Focus Strands

ACCESS AND EQUITY: TEACHING MATHEMATICS WITH AN EQUITY STANCE

This strand focuses on illuminating and eliminating inequities in mathematics education by sharing actions that can be implemented to reframe, reconceptualize, and/or intervene in order to provide high expectations for each and every student. Sessions include ones on pedagogical approaches that empower diverse populations of learners, including culturally responsive teaching, teaching for social justice, teacher noticing, and differentiation. Presentations focusing on theoretical foundations in social justice that frame equitable mathematics teaching and that permeate other strands and sustainable practices at all levels to promote fair and equitable mathematics teaching and learning are also included.

ASSESSMENT: A TOOL FOR PURPOSEFUL PLANNING AND INSTRUCTION ASSESS

Assessment is an integral component of planning mathematics instruction to best meet the needs of each and every learner. Sessions in this strand include ones that examine various assessment types and assessment that connects mathematics content and practices, as well as examining assessment that uses data to inform and provide feedback to teachers and students, support instructional decisions, and improve programs. Sessions that are aligned with principles of formative as well as summative assessment are welcome.

PURPOSEFUL CURRICULUM: CULTIVATING COHERENCE AND CONNECTIONS CCC

Sessions in this strand include, but are not limited to, the coherent development of mathematics curricula, learning progressions, and connections across topics and across all grade levels. Sessions that highlight the role that application, modeling, and contextualization should play, along with associated challenges, are encouraged. We invite reflection on current trends such as the meaningful use of teacher-created tasks and lessons, the use of technology, and the effective use of open curricula, especially as they relate to cultivating coherence and connections. Proposals with special emphasis on high school pathways are encouraged.

PROFESSIONALISM: LEARNING TOGETHER AS TEACHERS PROF

Through effective professional learning, teachers engage in a mathematical community that inspires, supports, and encourages ongoing growth and learning. Sessions in this strand will focus on, but not be limited to, both cultivating teacher's professional interests and activities such as lesson study, action research, book study, mentoring, collegial planning, coaching, social media, and virtual collaboration. Sessions that equip teachers to work with broader communities, such as advocating in their buildings and districts, addressing parent concerns, and working with researchers are encouraged.

TEACHING, LEARNING, & CURRICULUM: BEST PRACTICES FOR ENGAGING STUDENTS

Sessions in this strand include, but are not limited to, those that showcase classroom-tested and/or research-supported ideas and strategies, particularly the eight research-informed instructional practices from NCTM's *Principles to Actions*, as well as equitable instructional practices that create effective mathematics experiences and position each and every student to make sense of mathematics.

MATHEMATICAL MODELING: INTERPRETING THE WORLD THROUGH MATHEMATICS MODEL

Sessions in this strand will focus on, but are not limited to, how to find and design effective mathematical models, how to determine if mathematical models are reasonable and effective, working with open-ended tasks with potentially multiple solutions, and using applications of technology to make sense of mathematics.

TOOLS AND TECHNOLOGY: USING TECHNOLOGY TO EFFECTIVELY TEACH AND LEARN MATHEMATICS

Sessions in this strand include, but are not limited to, the innovative implementation of tools and technology, along with ways to use tools and technology to promote critical thinking and engagement, visualize and understand mathematical ideas, help students communicate their mathematical thinking, or build community and connection. Sessions may also address how courses in computer science can support mathematical reasoning and instructional goals.

EQUITY STRAND EQUITY

The Equity strand features presentations given by the Benjamin Banneker Association, TODOS: Mathematics for ALL, and Women and Mathematics Education.

MATHEMATICAL ASSOCIATION PRESIDENTS' SERIES

The Presidents' Series highlights connections within the mathematical community at different levels. Presentations are scheduled throughout the conference.

NCTM COMMITTEE STRAND

NCTM committee presentations are identified by the symbol above. For a list of all NCTM committees, please visit.nctm.org.

NEW TEACHER STRAND NEW T

Get insights, strategies, and techniques for new, early-career, and those training to be teachers to support your growth and success. Come join us!

CATALYZING CHANGE CHANGE

Dive into, learn about, and have critical conversations around the key areas of Catalyzing Change in High School Mathematics; Initiating Critical Conversations.

General Information

Tips for a Rewarding Annual Meeting & Exposition

- Access the conference app for program and speaker information, to connect with other attendees, and to share your feedback. Visit nctm.org/confapp.
- Access speaker handouts and build your schedule at nctm.org/planner.
- Become familiar with the layout of the Walter E. Washington Convention Center and the Marriott Marquis by reviewing the **floor plans** on pages 204–213.
- 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 my.nctm.org/annual18.
- Attend the Mathematics Education Trust Celebration
 Party, sponsored by Forrest T. Jones & Company and
 Texas Instruments, on Wednesday evening after the
 Opening Keynote. Toast the 2018 NCTM Lifetime
 Achievement Award recipients with our signature
 celebration drink, the Cherry Blos∑! Celebrate the start
 of an exciting conference with fellow math enthusiasts
 and friends. Listen to a talented group of student jazz
 musicians, and much more! (Tickets can be purchased
 through registration; limited supply.)
- Don't miss **ShadowCon** at 6:00 p.m. on Thursday, April 26. As it has become more and more popular, over the past three years we've made it part of the NCTM Annual Meeting experience.
- Check out the **Reflection Coves**, where highlighted and invited speakers will continue the conversation from their sessions in a more informal setting. You must be present at their sessions to receive information about the speakers' locations. Board members, Affiliate Relations Committee members, and the NCTM President will also spend time in the coves discussing topics of interest with attendees.
- Visit us in **NCTM Central** at the Exhibit Hall entryway. Join the community of educators exploring the many NCTM resources designed to meet your mathematics teaching challenges: Member Services, where you can learn more about the advantages of being an NCTM member and update your member profile; the Mathematics Education Trust desk, where you can inquire about grants, scholarships, or award funding available to you; the NCTM Bookstore, where you can browse the latest titles; and the Networking Lounge, where you can enjoy free Wi-Fi and connect with other attendees.
- Plan to spend some quality time making new connections and exploring the "hands-on, minds-on" math education offerings in the Networking Lounge. There will be 20-minute "mini-sessions" covering a range of topics from math tasks that you can implement in your classroom to

- information about NCTM resources and services. Many of the presenters and authors will be available directly after their sessions to answer questions. The **Math Circle** area will allow educators the chance to work on rich mathematics problems together, allowing them to enrich their own mathematical knowledge.
- Visit the **Exhibit Hall**, where more than 200 exhibitors will share the latest educational products.
- Stop by the **City Information Desk** in the registration area of the Exhibit Hall for information.
- Stay connected with other Annual Meeting attendees by using #NCTMannual on Twitter, Facebook, and Instagram.
- If you are attending the conference with colleagues, attend different presentations and share your learned knowledge after the conference.
- Be sure to silence cell phones during presentations.
- The more you participate in the presentations, the more you will get from the conference.
- Be safe! Remove your name badge when you leave the conference facilities at the end of the day.
- Tell us about your conference experience by responding to the post-conference online survey.
- 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 my.nctm.org/annual18.

Research Conference

The Research Conference, jointly sponsored by the NCTM Research Committee and the Special Interest Group on Research in Mathematics Education of the American Educational Research Association, will take place Monday—Wednesday, April 23–25, at the Walter E. Washington Convention Center. The Research Conference Registration Area will be located on the L Street Bridge of the Walter E. Washington Convention Center. Separate registration is required to attend Monday and Tuesday of the Research Conference. More information is available at nctm.org/researchconference. Stay connected with other Research Conference attendees by using #NCTMrc on Twitter, Facebook, and Instagram.

Registered NCTM Annual Meeting attendees may attend Wednesday's Research Conference presentations at no additional charge with their Annual Meeting badge.

The Wednesday program includes Linking Research and Practice sessions, with the Linking Research and Practice Plenary from 9:30 a.m. to 11:00 a.m. in Room 202A of the Walter E. Washington Convention Center. Concurrent sessions begin at 8:30 a.m. and continue until 4:00 p.m.

General Information

Technology at Your Fingertips

Wi-Fi Access

Complimentary Wi-Fi will be available in the Walter E. Washington Convention Center.

Username: NCTM Password: NCTM2018

Conference App

The NCTM app, available on Apple and Android mobile devices, as well as a mobile Web app for desktop and other devices, keeps you connected with every aspect of the Annual Meeting. The free app allows you to search sessions, speakers, and exhibits; view the Exhibit Hall floor plan; highlight your favorite presentations; get a Twitter feed update (official Twitter hashtag #NCTMannual); rate presentations, and connect with other attendees. Visit **nctm.org/confapp** for more information.

Presentation Handouts

Attendees can access available electronic presentation handouts through the conference app and online planner.

Online Planner

The online planner is a great way to search the conference program book, set up your schedule, and download presentation handouts. The online planner is up to date with the latest program changes and presentation information. Visit **nctm.org/planner**.

Program Updates

Check online for a digital copy of the program updates including all of the latest changes, cancellations, and additions!

Registration and Access to Presentations

Registration will be located in the Walter E. Washington Convention Center in Salon AB, East Registration. You must wear your badge to enter all presentations and the NCTM Exhibit Hall. You will need to show a picture ID to have your badge reprinted.

By registering for the NCTM 2018 Annual Meeting & Exposition, participants grant NCTM the right to use, in promotional materials, their likeness or voice as recorded on, or transferred to videotape, film, slides, audiotape, or other media.

NCTM Central

Make your meeting experience complete with a visit to NCTM Central in Exhibit Hall DE of the Walter E. Washington Convention Center during exhibit hours.

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

- Get your 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).
- Explore NCTM's **Classroom Resources** and learn about NCTM's collection of lesson plans, problems, and more.
- Connect with peers, social media, speakers, NCTM
 committee members, and authors, and do problems in the
 Networking Lounge. A presentation schedule is available
 on the conference app, and on pages 10, 14, 86, and 170.
- Learn more about NCTM's Professional Development offerings. Information will be available about upcoming events (Regional and Annual Conferences) and NCTM's new Professional Learning Services.

Your Opinion Counts

Thank you for attending the NCTM 2018 Annual Meeting & Exposition. In the days after the Annual Meeting, you will receive an e-mail asking you to evaluate your conference experience. Please complete the conference attendee survey. Use the Conference App to rate specific presentations you attend. Your feedback is important to us and will be instrumental in planning future meetings.

Shuttle Service

Attendees who reserved their hotel room through NCTM's official housing company will receive complimentary shuttle service from hotels in the NCTM housing block to the Walter E. Washington Convention Center. Hotels that are within walking distance of the convention center will not have shuttle service. Note: There will be late night shuttle service Wednesday, April 25, to accommodate attendees of the Mathematics Education Trust Celebration Party. Routes and schedules will be posted in your hotel lobby and can be found online at nctm.org/annualhousing. The schedule will be followed as closely as possible. If you have questions, please visit the shuttle desk located at the entrance to the Walter E. Washington Convention Center.

General Information

Bookstore

Save 25% off the list price on all purchases made at the onsite NCTM Bookstore located in Exhibit Hall DE of the Walter E. Washington Convention Center. Also, find a variety of specialty products that make great gifts, prizes, and incentives to spread the word about the importance of mathematics and that share your passion for the field. Preview the store at **nctm.org/catalog**.

Note on Sales Tax Exemptions: To qualify for sales tax exemption in the NCTM Bookstore, you must furnish a copy of a District of Columbia tax exemption certificate, issued by the District, at the time of purchase. The law requires NCTM to keep a copy of the certificate, which we cannot return to you. You must pay with a purchase order, check, or credit card from the school to which the exemption certificate is issued. NCTM cannot accept personal checks, personal credit cards, or cash in conjunction with tax exemption certificates.

The NCTM Bookstore is not equipped to handle shipping from the meeting site. The Capital Business Center in the main lobby of the Walter E. Washington Convention Center is ready to assist you with your shipping needs.

Information Booth

There will be an NCTM Information Booth at the Walter E. Washington Convention Center. It will be located outside room 103 In the South Street Lobby of the Convention Center. Convention staff will be available to answer your questions.

Lost-and-Found

You may retrieve or turn in lost-and-found items at the NCTM Information Booth in the Convention Center. At the end of the conference, all lost-and-found items will be turned over to Convention Center Security.

Mother's Room

Please inquire at the NCTM Information Booth in the South L Street Lobby of the Convention Center.

Restaurant Reservations

Explore the fabulous restaurants of Washington, D.C. Stop by the City Information Desk located in the Grand Lobby of the Walter E. Washington Convention Center, right next to NCTM Annual Meeting Registration. The friendly staff will be available to offer recommendations and make reservations. They can also assist you with directions and local information, from transportation and historical sites to shopping and entertainment.

Bag and Coat Check Service

A bag and coat check service is available for you to store your belongings during conference hours for a nominal fee. During conference hours Wednesday–Saturday, you can check your items at the bag/coat check, located next to NCTM Annual Meeting Registration in Salon AB, East Registration of the Walter E. Washington Convention Center. Please pick up all items each day by closing time; you may not leave items overnight.

First Aid

A first aid station will be staffed at the Convention Center in the NCTM Exhibit Hall DE during the conference. If you need medical services while in Washington, D.C, please check with your hotel concierge for the closest medical facilities. For any medical emergency, call 911 without hesitation.

Exhibit Hall Information

Exhibits

Make time to visit the NCTM Exhibit Hall. The hours allow ample opportunity to explore, try out, and purchase products and services for your classroom or to help you meet your career goals. You can also meet the people who produce these products, get fresh ideas, and see how products work. The hall will be open on:

Thursday 8:00 a.m.-5:00 p.m. Friday 8:00 a.m.-5:00 p.m. Saturday 8:00 a.m.-Noon

New this year! Dedicated Exhibit Hall time is scheduled 12:00 p.m.–1:30 p.m. on Thursday and Friday. Concessions will be available in the back of the NCTM Exhibit Hall. Check out the map of the Exhibit Hall on pages 212–213 and the Exhibitor Directory on pages 214–223.

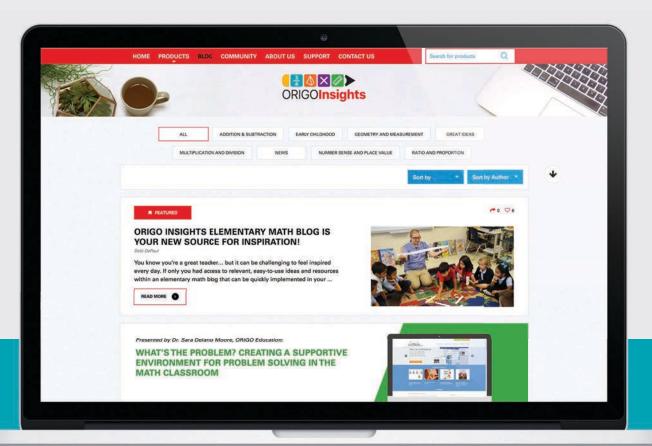
Exhibitor Workshops

Do you want more in-depth and personal interaction with exhibitors? Plan to attend the Exhibitor Workshops. These workshops offer a wide variety of topics with exhibitors showcasing their products and services. See the program for Exhibitor Workshop offerings, indicated by after the presentation number.

Introducing



ORIGOInsights



A new blog from ORIGO Education providing advice and support in helping you learn methods, ideas, and strategies to support the mathematics development of elementary learners.

Visit

origoeducation.com/blog/nctm18 for a list of our sessions at NCTM. Stop by booth #539 and mention *ORIGO Insights* to receive a free gift.









Our comprehensive programs offer the solutions you need for Grades Pre-K-12



















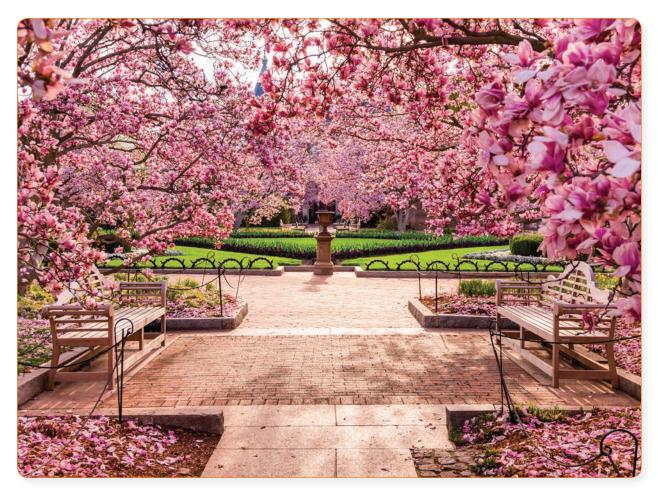






Wednesday Planner





HIGHLIGHTS

Annual Meeting Overview & Orientation, 1

Opening Keynote: When Content Meets Context: Toward a Revolution in STEM Education, 2

GET SOCIAL

Stay informed and get connected with attendees by using #NCTMannual on social media.



Conference App nctm.org/confapp



Twitter @NCTM



Instagram @NCTM.math



facebook.com/TeachersofMathematics

REGISTRATION HOURS

8:00 a.m.-7:00 p.m.

EXHIBIT HOURS

8:00 a.m.-5:00 p.m.

NCTM CENTRAL HOURS

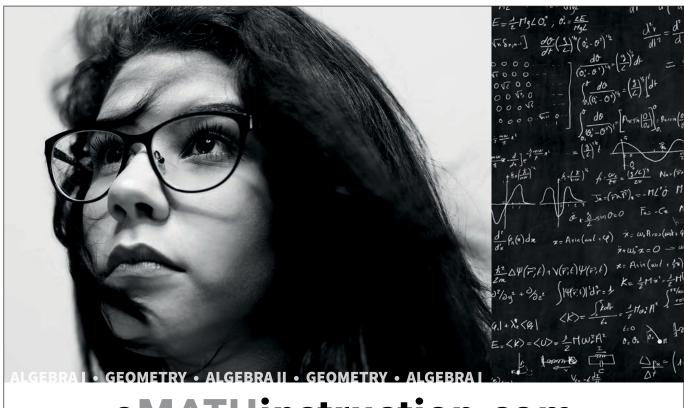
10:00 a.m.-7:00 p.m.

FIRE CODES

We have made every attempt to provide adequate seating for participants at the conference, but for your safety and because of fire regulations, only those with seats will be allowed in meeting rooms. To comply with fire codes, we will have to ask persons sitting on the floor or standing to leave the room.

Networking Lounge: Presentation Area	
12:30 p.m.– 1:15 p.m.	Session Tasks Matter Margaret (Peg) Smith
1:30 p.m.– 1:50 p.m.	Secondary Task Stairway Problem Fred Dillon
2:00 p.m.– 2:20 p.m.	Elementary Task Packing Candies Latrenda Knighten
2:30 p.m.– 2:50 p.m.	Elementary Task Fractions and Dynamic Number Lines John SanGiovanni
3:00 p.m.– 3:20 p.m.	Secondary Task Tiles Mary Vélez
3:30 p.m.– 4:50 p.m.	Session The Math Ed Collective: Standing Together for Our Students Theodore Chao and Andrea McCloskey

Networking Lounge: Math Circles		
1:00 p.m.– 2:30 p.m.	Introduction to Problem Solving Joshua Zucker	
3:00 p.m.– 4:30 p.m.	Taxicab Geometry Henri Picciotto	



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1 PROF

Annual Meeting Overview & Orientation

General Interest Session

Whether you are 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 to use the Conference App, and take the opportunity to network with other attendees.

NCTM Board of Directors

y@nctm

National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, Salon C

5:30 P.M.-7:00 P.M.



2 TECH

Opening Keynote: When Content Meets Context: Toward a Revolution in STEM Education

General Interest Session

In this address, Professor Emdin explores the historical and contemporary landscape of urban education and provides a new lens for viewing how and why teachers must focus on

deep excavations of culture in order to gain new approaches to improving STEM pedagogy. In particular, he merges cutting-edge research with real-life examples to provide ways that educators may re-imagine their roles in STEM teaching and learning and meet the needs of their most marginalized students.

Christopher Emdin is an associate professor in the Department of Mathematics, Science, and Technology at Teachers College, Columbia University, where he also serves as the Associate Director of the Institute for Urban and Minority Education. He is the creator of the #HipHopEd social media movement and Science Genius B.A.T.T.L.E.S., as well as the author of the award-winning book *Urban Science Education for the Hip-Hop Generation* and the New York Times best seller *For White Folks Who Teach in the Hood and the Rest of Ya'll Too*. Emdin was named the 2015 Multicultural Educator of the Year by the National Association of Multicultural Educators and has been honored as a STEM Access Champion of Change by the White House under President Obama. In addition to teaching, he served as a Minorities in Energy Ambassador for the U.S. Department of Energy.

The 2018 NCTM Lifetime Achievement Awards will be presented to Carole E. Greenes and William Renwick Speer at the Opening Session.

Christopher Emdin

Columbia University, New York, New York

Walter E. Washington Convention Center, Ballroom ABC

Don't miss the Mathematics Education Trust Celebration Party, sponsored by Forrest T. Jones & Company and Texas Instruments, on Wednesday evening after the Opening Session. Toast the 2018 awardees, enjoy light refreshments, and listen to some great jazz! Purchase your ticket at registration.

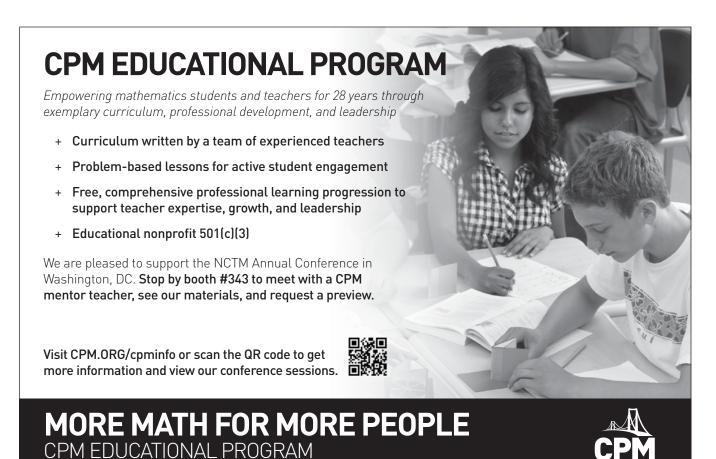


Regional Caucuses

The NCTM Affiliates' Regional Caucuses and Delegate Assembly are open to any interested NCTM member. These sessions provide a forum and opportunity for sharing information on emerging issues and offer insight into the ways in which the Council might address issues facing mathematics education and the organization. See Session 7 on page 19 for the Delegate Assembly information. The Regional Caucuses information is below.

Marriott Marquis Hotel

CAUCUS	PRESIDERS	ROOMS
Affiliates-at-Large	Gina Kilday, Metcalf Elementary School, Exeter, Rhode Island	Capitol/Congress
Canadian	Shelley Rea Hunter , Carleton North High School, Florenceville, New Brunswick, Canada	Capitol/Congress
Central	Scot Acre, University of Indianapolis, Royal Oak, Michigan Becky Walker, Cooperative Educational Services Agency 7, Green Bay, Wisconsin	Independence Ballroom D
Eastern	Catherine (Cathy) Boutin, John F. Deering Middle School, West Warwick, Rhode Island Kathleen (Taffy) McAneny, West Chester University, Elkton, Maryland	Independence Ballroom A–C
Southern	Judy Rodgers, Seldens Landing Elementary School, Leesburg, Virginia Jeremy Zelkowski, University of Alabama, Tuscaloosa, Alabama	Independence Ballroom E
Western	Joanie Funderburk, Student Achievement Partners, Parker, Colorado Maci Nelson, Washington Middle School, Seattle, Washington	Liberty Ballroom I–K



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- Take home classroom-ready activities
- Try out online math strategy games
- Enter the prize drawing

Mathematics Education Trust

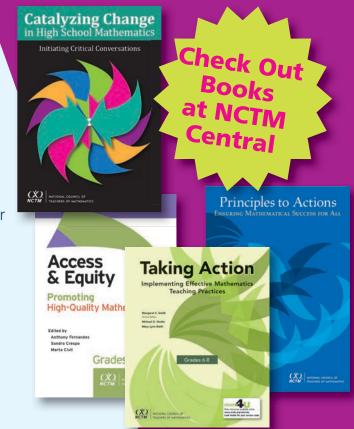
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Thursday Planner



HIGHLIGHTS

Annual Meeting Overview & Orientation, 3

Access and Equity: Promoting High-Quality Mathematics in Pre-K-12, 4

President's Address: Catalyzing Change in High School Mathematics: Initiating Critical Conversations, 5

Taking Action: Implementing Effective Mathematics Teaching Practices in Elementary and Middle School Classrooms, 6

"... I could have freed a thousand more ...," 8

New Teacher Strand Kickoff, 49

Challenging Math Problems Worth Solving, 66

Three Critical Components for Achieving Rigor, 87

Strategies and Tasks to Build Procedural Fluency from Conceptual Understanding, 249

ShadowCon, 254

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REGISTRATION HOURS

EXHIBIT HOURS

NCTM CENTRAL HOURS

7:00 a.m.—5:00 p.m.

8:00 a.m.-5:00 p.m.

8:00 a.m.-5:00 p.m.

FIRE CODES

We have made every attempt to provide adequate seating for participants at the conference, but for your safety and because of fire regulations, only those with seats will be allowed in meeting rooms. To comply with fire codes, we will have to ask persons sitting on the floor or standing to leave the room.

Networ	king Lounge: Presentation Area
9:00 a.m.– 9:20 a.m.	Session Advocacy 101: How to Get Your Foot in the Door & Keep It Out of Your Mouth Peg Cagle
9:30 a.m.– 9:50 a.m.	Author Talk 5 Practices for Orchestrating Productive Mathematics Discussions*, 2nd Edition Margaret (Peg) Smith
10:00 a.m.– 10:20 a.m.	NCTM Session Mentor Match MARC Committee
10:30 a.m.– 10:50 a.m.	Session Representing Student Thinking Amy Lucenta
11:00 a.m.– 11:20 a.m.	Author Talk Enhancing Classroom Practice with Research behind Principles to Actions* Denise Spangler and Jeffrey Wanko
11:30 a.m.– 11:50 a.m.	NCTM Session Catalyzing Change: How Stats and Math Are Different Chris Franklin
12:00 p.m.– 12:20 p.m.	Session High School Math: The Status Quo Is Unacceptable Eric Milou
12:30 p.m.– 12:50 p.m.	Author Talk The Impact of Identity in K-8 Mathematics: Rethinking Equity-Based Practices Julia Aguirre
1:00 p.m.– 1:20 p.m.	NCTM Session Getting the Most Out of the My NCTM community NCTM Staff
1:30 p.m.– 1:50 p.m.	Session Multi-Tiered Systems of Support: Developing Engaging Interventions Karen Karp and Barbara Dougherty
2:00 p.m.– 2:20 p.m.	Author Talk Essential Understandings Rose Zbiek
2:30 p.m.– 2:50 p.m.	NCTM Session Catalyzing Change: From a Supervisor's Perspective John Staley
3:00 p.m.– 3:20 p.m.	Session The Basketball Problem Carl Oliver
3:30 p.m.– 3:50 p.m.	Author Talk Unpacking Fractions: Classroom-Tested Strategies to Build Students' Mathematical Understanding* Monica Neagoy
4:00 p.m.– 4:20 p.m.	NCTM Session Resources Available to Members Classroom Resources Committee (CRC)
4:30 p.m.– 4:50 p.m.	NCTM Session Publishing with NCTM Journals NCTM Journal Editors

^{*} Author will be available after talk for book signing

Networking Lounge: Math Circles		
9:00 a.m.–	Insights from a New Math Teachers' Circle	
10:30 a.m.	Teresa Dunleavy, Shannon Reider, and Lizi Mets	
11:00 a.m.– 12:30 p.m.	Mathemagical Card Tricks Matt Roscoe and Fred Peck	
1:00 p.m.–	Compositions	
2:30 p.m.	Joshua Zucker	
3:00 p.m.–	African Mathematical Circle	
4:30 p.m.	Kyndall Brown	

Bring Focus to Your High School Mathematics Curriculum

Now Available!

Catalyzing Change in High School Mathematics: Initiating Critical Conversations

atalyzing Change identifies and addresses critical challenges in high school mathematics to ensure that each and every student has the mathematical experiences necessary for his or her future personal and professional success.

Themes of Catalyzing Change include:

- Broadening the purposes for teaching high school mathematics beyond a focus on college and career readiness
- Dismantling structural obstacles that stand in the way of mathematics working for each and every student
- Implementing equitable instructional practices
- Identifying essential concepts that all high school students should learn and understand at a deep level
- Organizing the high school curriculum around these essential concepts to support students' future personal and professional goals
- Providing key recommendations and next steps for key audiences

Catalyzing Change engages all individuals with a stake in high school mathematics to catalyze critical conversations across groups.

Supporting Sessions

Discover this research-based resource, its key recommendations, and the Essential Concepts it presents when you attend one or more sessions designed specifically to answer your questions during the NCTM Annual Meeting.

Thursday, April 26

 President's Address: Catalyzing Change in High School Mathematics: Initiating Critical Conversations

SESSION: 5

- Critical Conversations to Catalyze Change in High School Mathematics
 SESSION: 69
- Rethinking What Each and Every High School Student Needs Related to Algebra and Functions

SESSION: 194

• The Wonders and Joys of Mathematics and Statistics

SESSION: 246

Friday, April 27

 Creating Equitable Structures to Support Success in High School Mathematics
 SESSION: 317

SESSION: 317

 Embracing Quantitative Literacy and Statistical Thinking for All High School Students

SESSION: 420

- President Elect Address: Catalyzing Change: Identity, Agency, Positioning, and Equitable Instructional Practices
 SESSION: 439
- Pathways through High School Mathematics: Let's Start the Conversation SESSION: 544



Catalyzing Change in High School Mathematics

Initiating Critical Conversations

Saturday, April 28

- Mathematical Modeling in Pathways through High School Mathematics SESSION: 569
- Transforming High School Geometry
 SESSION: 592
- Why Ask Why? Proof & Inquiry in High School Mathematics

SESSION: 626

 Closing Keynote: Mathematics for Human Flourishing

SESSION: 664



3 PROF

Annual Meeting Overview & Orientation

General Interest Session

Whether you are 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 to use the Conference App, and take the opportunity to network with other attendees.

NCTM Board of Directors

y@nctm

National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, Ballroom A/B

8:00 A.M.-9:00 A.M.

Focus on Equity, Taking Action, and Catalyzing Change Kickoff A&E







Effective instruction, opportunity, and positive classroom experiences are all critical to student learning! The Thursday Program of the 2018 Annual Meeting will begin with three special keynotes highlighting initiatives members have indicated are important and reflect NCTM's recent efforts to support teachers and leaders:

Catalyzing Change in High School Mathematics: Initiating Critical Conversations

Access & Equity: Promoting High Quality Mathematics

Taking Action: Implementing Effective Mathematics Teaching Practices

Reflective of the core needs of the profession, society, and our communities, these initiatives represent three critical areas of NCTM's ongoing effort to support change, conversation, and provide resources.



Access and Equity: Promoting High-Quality Mathematics in Pre-K-12

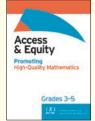
Keynote Session

Drawing from language and culture as intellectual resources, this session presents the four-book series on teaching highquality mathematics in pre-K–12. Strategies to promote access and equity in school will illustrate: 1) practices to engage learners in rigorous mathematics, 2) school and community partnerships, 3) culturally relevant pedagogy, and 4) tools for professional development.

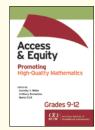


Sylvia Celedón-Pattichis University of New Mexico, Albuquerque Dorothy White University of Georgia, Athens









Walter E. Washington Convention Center, Ballroom C













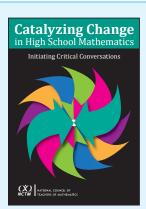


5 CHANGE Catalyzing Change in High School Mathematics: Initiating Critical Conversations President's Address

Keynote Session

Catalyzing Change in High School Mathematics: Initiating Critical Conversations identifies and addresses critical challenges in high school

mathematics to ensure that each and every student has the mathematical experiences necessary for his or her future personal and professional success. This session provides an overview of *Catalyzing Change* and initiates critical conversations centering on the following serious challenges: explicitly broadening the purposes for teaching high school mathematics beyond a focus on college and career readiness; dismantling structural obstacles that stand in the way of mathematics working for each and every student; implementing equitable instructional practices; identifying Essential Concepts that all high school students should learn and understand at a deep level; and organizing the high school curriculum around these Essential Concepts in order to support students' future personal and professional goals. *Catalyzing Change* is written to engage all individuals with a stake in high school mathematics in the serious conversations that must take place to bring about and give support to necessary changes in high school mathematics.



Matt Larson

President, National Council of Teachers of Mathematics, Reston, Virginia; Lincoln Public Schools, Nebraska

Walter E. Washington Convention Center, Ballroom A/B



6 TLC

Taking Action: Implementing Effective Mathematics Teaching Practices in Elementary and Middle School Classrooms

Keynote Session

The session engages teachers in activities that support *Principles to Actions* Effective Mathematics Teaching Practices. The activities will include analyzing and discussing artifacts including mathematical tasks, student work, and episodes of classroom teaching. Activities are drawn from the volumes in NCTM's Taking Action series for K–5 and 6–8.



Margaret (Peg) Smith
University of Pittsburgh, Pennsylvania
DeAnn Huinker

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Wisconsin–Milwaukee

Marriott Marquis, Marquis Ballroom Salon 5&6 (Level M2)



















8:00 A.M.-9:00 A.M.

6.1 CW MODEL

Escape Room Adventures for Middle & High School

General Interest Exhibitor Workshop

Put your problem-solving and teamwork skills to the test to unlock the clues and solve the mystery to escape! Strategies and cooperation are critical to success in this challenge. Experience problem-solving and mathematical modeling activities in this lively and challenging Escape Room context that you can use in your classroom!

Pearson Learning Services

Chandler, Arizona

Walter E. Washington Convention Center, 143 C



University of New Hampshire

Master of Science for Teachers Program

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For secondary and middle school mathematics teachers who are seeking a broader, deeper background in many areas, including algebra, geometry, and analysis. Extend your problemsolving skills, explore mathematics content, the current issues mathematics and in education.

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ew I

Steps to Success: Blending Discourse, **Conceptual Understanding, and** Reasoning in Elementary Math

Pre-K-2 Exhibitor Workshop

Goals: student conceptual understanding; focus on student thinking; increase teachers' math knowledge. Solution: Stepping Stones. Learn about the ORIGO teaching model from co-founder James Burnett and experience a Stepping Stones lesson. Hear from current program users about their success building a strong elementary math program for every learner.

ORIGO Education

Earth City, Missouri

Walter E. Washington Convention Center, 159 AB

6.3 EW TLC

The 5 Secrets To Highly Mathematics **Instruction: Seeking Student** Perseverance!

General Interest Exhibitor Workshop

What is your mathematics instruction story? How do you know it is a good one? In this session, Dr. Tim Kanold examines 5 daily choices that when well implemented lead to improved student perseverance during your daily mathematics lessons. When well implemented, these criteria will bring great satisfaction to your work as a mathematics professional.

Houghton Mifflin Harcourt

Austin, Texas

Walter E. Washington Convention Center, 156

6.4 **(CW)** TECH

Level Up with Games-Based Math: See Engagement, Persistence, and **Achievement Skyrocket in Your Class**

Coaches/Leaders/Teacher Educators **Exhibitor Workshop**

Learn to leverage adaptive, game-based challenges and gamification principles to provide joyful, 'just in time' activities that personalize learning for all students. Teachers, coaches, and administrators will experience practical strategies for 1:1, computer lab, and BYOD device settings to move K-12 students to deeper levels of understanding.

Mangahigh.com

London, United Kingdom

Walter E. Washington Convention Center, 158 AB













9:15 A.M.-10:30 A.M.

7 PROF

Sixty-Ninth Annual Delegate Assembly

General Interest Session

This session is a forum for delegates, designated leaders of NCTM Affiliates, and NCTM members to make recommendations to the NCTM Board of Directors concerning activities and policies of NCTM and mathematics education.

Member and Affiliate Relations Committee

National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, Salon C

9:30 A.M.-10:30 A.M.

8 A&E

". . . I could have freed a thousand more

General Interest Session

The roles that race and social class play in the teaching and learning of school mathematics will be exposed and examined. The importance of a social justice paradigm in school mathematics will be espoused. This session is not for the faint of heart!

Lee Stiff

Past President, National Council of Teachers of Mathematics, Reston, Virginia; North Carolina State University, Raleigh

Walter E. Washington Convention Center, Ballroom C

9 ccc

1 to 1 Million: Number Sense Progressions for K-5

Pre-K-2 Session

How do we tie together number representations to form consistent and deep understanding in our K–5 students? Come explore step-by-step kindergarten to grade 5 progressions from number paths to open number lines and from counting collections to place value disks. Receive free online links and handouts for counting and place value resources!

Arjan Khalsa

CEO Conceptua Math, San Rafael, California

Walter E. Washington Convention Center, 146 A

9:30 A.M.-10:30 A.M.

10 TLC

A Truly "Hands-On" Approach to Applying the Distributive Property

6-8 Session

This fun and engaging presentation will emphasize a deep understanding of the distributive property, which will be applicable for students in grade 4 through algebra 1 (grade 9). Attendees will be able to easily assess each student's understanding of the distributive property, as well as quickly see if their students can factor a trinomial.

David Chamberlain

Capistrano Unified School District, San Juan Capistrano, California

Marriott Marquis, Independence Ballroom D (Level M4)

11 TLC

Be Precise with Math Language: Instead of This, Say That!

3-5 Session

Children must understand the language of math; therefore, educators should use precise language. We provide a language guide in five areas: counting, whole numbers, rational numbers, geometry, and measurement. We demonstrate how precise language contributes to improved conceptual understanding and promotes access and equity for diverse learners.

Sarah Powell

@sarahpowellphd University of Texas at Austin

Elizabeth Hughes

The Pennsylvania State University, State College

Elizabeth Stevens

University of Texas at Austin

Walter E. Washington Convention Center, 147 B













12 TLC

Beyond Warm-Ups and Exit Tickets: Effective Ways to Open and Close a Lesson

8-10 Session

Participants will step into the student role to experience engaging and meaningful activities that can be used to open and close a content lesson. Participants will reflect on their experience and how activities like this can support greater understanding and retention of concepts and help develop mathematical reasoning and problem solving.

Connie Horgan

Math Solutions, Jerome, Idaho

Sheila Yates

Math Solutions, Sioux Falls, South Dakota

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

13 CCC

Connecting All of Quadratics through Completing the Square, Vertex Form, and Transformational Graphing

8-10 Session

Learn how multiple aspects of teaching quadratics are connected using the vertex form and transformational graphing. Participants will graph quadratics using vertex and symmetry, connect the vertex form to transformations, and learn a concrete and pictorial model for completing the square. Leave with a deeper understanding of the quadratics connection!

Jason Bragg

St. Lucie Public Schools, Fort Pierce, Florida

Christina Worley

St. Lucie Public Schools, Fort Pierce, Florida

Elizabeth Pruitt

St. Lucie Public Schools, Fort Pierce, Florida

Walter E. Washington Convention Center, Salon I

4 TEC

Creating Fractals with Complex-Valued Functions

10-12 Session

Strengthen your students' understanding of complex numbers and the complex plane in an engaging activity where they will create fractals. We will explore iterations of complex-valued polynomial functions and use technology to create Julia set fractals of these functions. An optional extension for a computer programming class will be included.

Frances Worek

Johns Hopkins Center for Talented Youth, Baltimore, Maryland

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

15 PROF

Effective Mathematics Teaching: Lessons Learned from Ireland, the U.S., the U.K., and South Korea

10-12 Session

This presentation will consider recent research results from observations and interviews with effective math teachers from Indiana, Ireland, the U.K., and South Korea. Best practices will be discussed, including how to apply the concepts to a collaborative cadre of teachers looking to inspire our youth.

James Freemyer

Indiana Wesleyan University, Marion

Marriott Marguis, Independence Ballroom F-H (Level M4)

16 **CCC**

Engaging in Proportional Reasoning through the Eyes of a Middle School Student

6-8 Session

Participants will engage in a task from the Ratios and Proportional Relationships domain of the Common Core. They will dive into "What is proportional reasoning?" through experiencing a rich task and considering student work at different grade levels. Participants will also use the TQE Process (tasksquestions-evidence) and video to examine the task in a sixth-grade classroom.

Brian Dean

y@FLMathNinja

Pasco County Schools, Land O' Lakes, Florida

Edward Nolan

Towson University, Maryland

Walter E. Washington Convention Center, 154 AB













Sadlier Math | Grades K-6

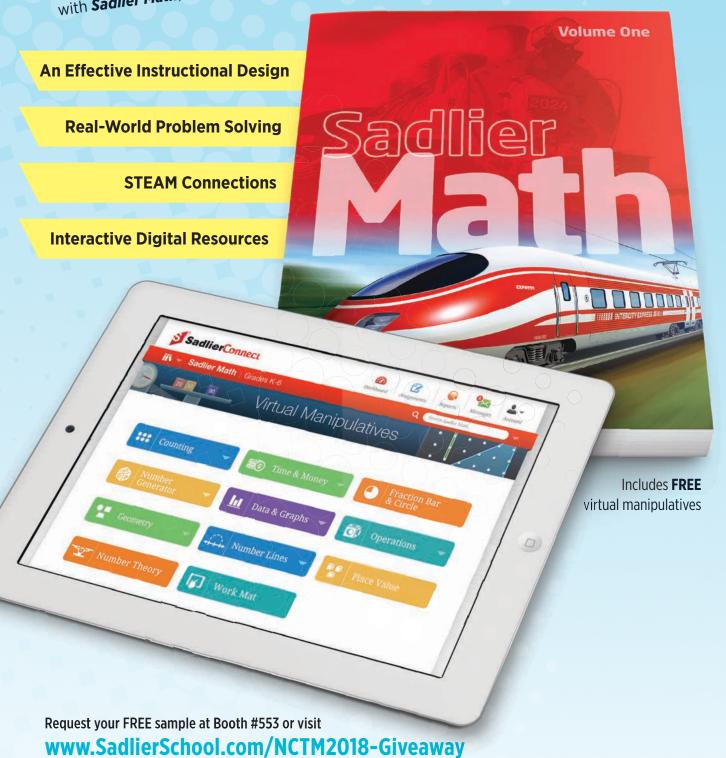
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Sadlier School



From Hand-Holding to Problem Solving: Learning How to Teach Students to Grapple with Uncertainty

General Interest Session

Our goal as math teachers isn't to drill algorithms, it's to teach students to be problem solvers. This is especially true when working with students who view disengagement as the BEST option for handling uncertainty. We will share our lesson-study journey to shift our focus from teacher scaffolding to student-centered problem-solving strategies.

Edward Fletcher

Brooklyn Frontiers High School, NYC Department of Education, New York

Kevin Ehly

Brooklyn Frontiers High School, NYC Department of Education, New York

Alona Cohen

NYC Department of Education, Brooklyn, New York

Walter E. Washington Convention Center, Salon G

18 MODEL

From Percentages to Algebra Using Authentic Problem Contexts

6-8 Session

This session focuses on using percentages to solve challenging tasks in manufacturing marketing. Participants will be provided with authentic, meaningful scenarios that ask students to answer questions, dig deeper, and model the situation mathematically. Classroom implementation ideas for the tasks, including Number Talks and TTLP, will be shared.

Deborah Ferry

Macomb ISD, Sterling Heights, Michigan

Marianne Srock

Macomb ISD, Clinton Township, Michigan

Walter E. Washington Convention Center, 152 A

9 TLC

How Students Make Sense of the Number Line for Fractions

3-5 Session

Using and connecting mathematical representations is one of NCTM's eight Mathematics Teaching Practices. Participants will explore different models for fractions (circles, paper folding, chips, and the number line). Sample lessons, student work, and interview data will document how the models support students' fraction learning in different ways.

Kathleen Cramer

University of Minnesota, Minneapolis

Debra Monson

University of St. Thomas, St. Paul, Minnesota

Terry Wyberg

University of Minnesota, Minneapolis

Walter E. Washington Convention Center, 146 C

Reflection Cove following presentation.

20 A&E

Increasing Access by Rethinking the First Two Weeks of School

Coaches/Leaders/Teacher Educators Session

Come learn how one district revamped the first two weeks of school at the elementary level to improve access and equity for students. Our model promotes productive struggle, rich tasks, and use of evidence from day one to eliminate grouping bias. We will share the purpose, process, and product of our work. Tasks used in grades 1–5 will be shared.

Heather Dyer

Howard County Public School System, Ellicott City, Maryland **Molly Caroland**

Howard County Public School System, Ellicott City, Maryland

Walter E. Washington Convention Center, 102 AB













21 TLC

Learning Is Not a Spectator Sport: Constructing Meaningful Talk in the Math Classroom

General Interest Session

This interactive session focuses on creating a classroom culture that requires active student engagement and participation. We will explore ways to get started, consider steps to raise and lower demand through varied types of questioning techniques, and highlight strategies to engage and empower students in meaningful mathematics.

Steve Vancil

y@bagger_vancil

David Douglas SD, Portland, Oregon

Erin Gardenhire

David Douglas SD, Portland, Oregon

Amy McQueen

David Douglas SD, Portland, Oregon

Marriott Marquis, Liberty Ballroom N-P (Level M4)



Making Learning Visible in Mathematics

General Interest Session

How can John Hattie's work on Visible Learning inform mathematics instruction? How do instructional strategies with high-effect size align with the effective teaching practices from Principles to Actions? Let's examine practical examples of how these important documents can make mathematics achievement attainable for all students

Linda Gojak

y @LindaGojak

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Willowick, Ohio

Walter E. Washington Convention Center, Ballroom A Reflection Cove following presentation.

23 ISSUES

Mathematical Modeling Goes to College: An Approach Inspired by the #MTBoS

Higher Education Session

We share a mathematical modeling course piloted twice at college entry level. The course places an emphasis on student actions of analyzing data, naming and/ or interpreting variables, setting up and interpreting equations, interpreting and using the results of technology (e.g., linear fitting), and reading and writing scientific reports.

Dev Sinha

University of Oregon, Eugene

Walter E. Washington Convention Center, 202 A

24 PROF

Mathematics Education Trust (MET) Grants and Scholarships—New Opportunities Available!

General Interest Session

The Mathematics Education Trust (MET), of the National Council of Teachers of Mathematics, supports teachers, schools, and students with funds for materials, lesson development, conference attendance, courses, professional development, technology, and action research. Learn what's available and how to apply. Hear tips for choosing the most appropriate award for you and enhancing your chances to win it!

Richard Seitz

Trustee, MET Board of Trustees

Walter E. Washington Convention Center, 204 C

25 TECH

Moving Geometry: Using Technology to Support Spatial Reasoning in Elementary School

3-5 Session

I will share lessons and resources designed for the elementary school grades that make geometry so interesting and so valuable, you'll want to teach it all year long, not just in June! These resources involve online dynamic geometry tools that help develop spatial reasoning, which supports mathematical thinking across the curriculum.

Nathalie Sinclair

@geometry4yl

Simon Fraser University, Burnaby, British Columbia, Canada

Walter E. Washington Convention Center, 203 AB













26 TLC

Nodes and Edges and Trees, Oh My!

6-8 Session

Join us to learn how we sparked students' excitement in problem solving using challenging, yet accessible, unsolved mathematics problems! We will examine video clips and student work to illustrate how elementary and middle school students can engage with problems like the Graceful Tree Conjecture and the Frobenius Coin Problem.

Jenna O'Dell

Bemidji State University, Minnesota

Cynthia Langrall

Illinois State University, Normal

Amanda Cullen

Illinois State University, Normal

Walter E. Washington Convention Center, 152 A

27



Planning Questions and Persevering in the Practices

8-10 Session

Teachers need to persevere too! In supporting productive struggle, teachers need to persevere in questioning students while resisting the urge to give away answers too quickly. We share techniques to plan for students to persevere in problem solving and construct viable arguments, using three interesting mathematical problems. BYOD-TI-84 or similar.

Theresa Gurl

Queens College, CUNY, New York

Ryan Fox

Maspeth High School, Queens, New York

Nikolina Dabovic

Maspeth High School, Queens, New York

Arielle Eager Leavitt

The Queens School of Inquiry, New York

Walter E. Washington Convention Center, 151 A

28 PR



Principles to Actions: Results of a Successful Teacher Development Program

Research Session

In this presentation, we examine how learning communities have been created in a successful model for professional development, the coding scheme and rubric that was used to assess teacher change, and the changes in the teachers' practice that were coupled with increased percentages of students meeting the state learning standards for mathematics.

Lynn Tarlow-Hellman

Metamorphosis Teaching Learning Communities, New York, New York

Walter E. Washington Convention Center, 103 B

29



Putting the Active into Interactive Manipulatives

3-5 Session

Using interactive manipulatives allows the teacher to model standards-based math concepts and provide practice sessions on almost any device. Learn criteria for effective selection of optimal sites, innovative use with accompanying manipulatives, problem-solving integration, assessment ideas, and strategies for equitable access.

Bruce Brodney

> @hescowler

St. Petersburg College, Saint Petersburg, Florida

Sandra Brodney

Pinellas County Schools, Saint Petersburg, Florida

Walter E. Washington Convention Center, 150 A













30 TECH

Teaching Mathematics with Technology: Activities and Ideas for Your Classroom

10-12 Session

In this presentation, technology-based mathematical tasks will be presented that utilize freely accessible tools (e.g., Desmos, GeoGebra). Different ways teachers can evaluate technology-based mathematical tasks will be shared, and strategies for implementing tasks to support students' learning will be discussed. Please bring a laptop or tablet!

Karen Hollebrands

North Carolina State University, North Carolina

Brooke Kott

Greenville, North Carolina

Walter E. Washington Convention Center, 145 AB

31 CCC The Promise of Open Curriculum

8-10 Session

Illustrative Mathematics has developed a complete, standards-aligned, openly licensed curriculum for grades 6–8 and is in the process of writing curriculum for high school. In this talk we will give an overview of this work, describe how we are thinking about high school pathways, and discuss the promise of open education resources.

William McCallum

Illustrative Mathematics, Tucson, Arizona

Marriott Marquis, Liberty Ballroom M (Level M4)

32

The Role of Calculus in the Transition from High School to College Mathematics

10-12 Session

The transition from high school to college is fraught with pitfalls for students that range from rising remediation in college to high school calculus as an expectation for college-intending students. This session will provide an overview of what we know and open a discussion of what needs to be done.

David Bressoud

y@dbressoud

Macalester College, St. Paul, Minnesota

Walter E. Washington Convention Center, 140 AB

33 PROF

University-School PD Partnership: Conceptually Based Basic Skills Acquisition for All

Pre-K-2 Session

We will describe a partnership between a Title I elementary and two teacher educators, one in mathematics and one in special education. These professors partnered with pre- and in-service teachers to provide PD focused on basic skills. Number talks, games, PLCs, whole school contract. and strategy-based (non-timed) assessments will be shared.

Sararose Lynch

@rosebudlynch50

Westminster College, New Wilmington, Pennsylvania

Jeremy Lynch

Slippery Rock University, Pennsylvania

Walter E. Washington Convention Center, 146 B













34 TLC Walk the (Number) Line

Pre-K-2 Session

How can students best visualize relationships between numbers? The number line! In this session, we will explore how the number line can be used throughout the elementary school years to support number sense. We will discuss strategies and create activities for teaching addition and subtraction, rounding, multiples, and fractions on a number line.

Ashley Hinton

y@HintonHeroes

Durham Academy Lower School, North Carolina

Nataki McClain

Durham Academy, North Carolina

Marriott Marquis, Liberty Ballroom L (Level M4)

34.1 **ew** ccc

Empowering Learners through Journal Writing in Math Classroom

3-5 Exhibitor Workshop

How does keeping a journal help students reflect on their learning? Should students write journals after each lesson? Participants will be exposed to different types of journals and how they may be used for students to articulate learned mathematical concepts. Join us and discover how to make Journal Writing a strategy that works in your classroom.

Shing Lee Publishers Singapore

Walter E. Washington Convention Center, 143 C

34.2 **ew** TLC

Steps to Success: Blending Discourse, Conceptual Understanding, and Reasoning in Elementary Math

3-5 Exhibitor Workshop

Goals: Student conceptual understanding; Focus on student thinking; Increase teachers' math knowledge. Solution: Stepping Stones. Learn about the ORIGO teaching model from co-founder James Burnett & experience a Stepping Stones lesson. Hear from current program users about their success building a strong elementary math program for every learner.

ORIGO Education

Earth City, Missouri

Walter E. Washington Convention Center, 159 AB

34.3 **EW** ASSESS

Get to Root of the Problem: Supporting Teachers in Eliciting & Addressing Student Misconceptions

General Interest Exhibitor Workshop

Teachers need a deep and flexible understanding of the mathematics they teach and diagnostic approaches for identifying strengths and difficulties. Cheryl Tobey, mathematics consultant, will lead activities and discussion that will help teachers build their own knowledge of concepts, diagnostic approaches, and effective instructional strategies.

McGraw Hill Education Columbus, Ohio

Walter E. Washington Convention Center, 158 AB













34.4 **ew**

Houghton Mifflin Harcourt Exhibitor Workshop

Exhibitor Workshop

Houghton Mifflin Harcourt Austin, Texas

Walter E. Washington Convention Center, 158 AB

9:45 A.M.-11:00 A.M.

35 TLC

A Strategy-Based Approach to Teaching and Assessing Multiplication Fact Fluency

3-5 Workshop

What does it really mean to be fluent with multiplication facts? In this session, we will unpack the meaning of fluency and examine a trajectory for how students master their facts. Come explore how we can use Quick Looks, fact strategies, games, and formative assessment strategies to ensure all students develop multiplication fact fluency.

Lucas Elliott
University of Louisville, Kentucky
Jennifer Bay-Williams
University of Louisville, Kentucky

Walter E. Washington Convention Center, 206

36 TECH

Action-Consequence-Reflection Activities: Using Technology to Make Math Stick!

10-12 Workshop

Perform actions with technology and ask targeted questions to optimize student reasoning about mathematical implications. Explore dynamic activities with TI graphing calculators, GeoGebra, or Desmos that use multiple representations to connect algebra, geometry, and precalculus; promote conceptual thinking; and support CCSS and Principles to Actions.

Karen Campe

y @KarenCampe

Consultant, New Canaan, Connecticut

Fred Decovsky

Retired, Bradley Beach, New Jersey

Walter E. Washington Convention Center, 207 A

37 A&E

BBA: Keeping It REAL (Relevant and Engaging Activities That Enhance Learning) with Our Students!

8-10 Workshop

This session will engage participants in meaningful activities that can be readily implemented in an algebra classroom. They are designed to reach all students by connecting their contextual learning and the content.

Aminah Eddings

Little Rock School District, Arkansas

Tonjuna Iverson

Little Rock School District, Arkansas

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

Start your day right with **Sunrise Yoga** held 6:00 a.m.—7:00 a.m., Thursday—Saturday. The hour-long, all-levels yoga flow class includes a math lovers yoga mat and will leave you relaxed and invigorated! (Visit NCTM Registration to register)















9:45 A.M.-11:00 A.M.



Classroom Structures for Differentiation: Ensuring Deep Mathematical Thinking for All

8-10 Workshop

Supporting students with diverse backgrounds is challenging. Starting with a broad overview of research, we will investigate structures to ensure every student can engage with content and practices. Examples include student-posed problems; low-floor high-ceiling projects; practice, pushing, pondering homework; and standards-based assessments.

Avery Pickford

y@woutgeo

Lick-Wilmerding High School, San Francisco, California

Walter E. Washington Convention Center, 209 ABC

39 TLC

Raindrops on Roses . . . A Few of My Favorite CALCULUS Things

10-12 Workshop

Who invented the Calculus? Your students. Come experience several student-centered activities that will deepen your students' understanding of vocabulary, theorems, and formulas. In this workshop, participants will play the role of the student to get a firsthand account of how to implement in your own classroom.

McKendry Marano North Chesterfield, Virginia Elizabeth Wynne Midlothian, Virginia

Walter E. Washington Convention Center, 103 A

40 TLC

Counting Circles: A Daily Number Routine to Address Numeracy

6-8 Workshop

Students need daily practice playing with numbers in order to build number fluency. A number routine, like counting circles, provides a safe environment for students to engage in mathematical discussions and build numeracy strategies. Come learn about counting circles and get started planning how to sustain this daily routine in your classroom.

Sadie Estrella

y@wahedahbug

Illustrative Mathematics, Hana, Hawaii

Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)

41 TLC

Exploring Tasks and "Toys" That Develop Spatial Reasoning

Pre-K-2 Workshop

Research ties spatial reasoning skills to future success in math and reading. You will get to play with spatial reasoning through tasks that can be immediately used in the classroom. We'll discuss spatial reasoning skills like mental rotation, visual spatial reasoning, and spatial vocabulary in a playful way, appropriate for four-to eight-year-olds.

Meka Barry

y@mekawilhoit

Frankfort Independent School District, Kentucky

Meg Hearn

LearnZillion, Washington, D.C.

Walter E. Washington Convention Center, 150 B

42



Fraction Sense Is Tied to Common Sense

3-5 Workshop

When working with fractions, students often believe they must memorize a new set of rules and procedures to be successful. However, the most successful students have a deeper understanding: fraction sense. Let's examine research-based strategies that will allow students to calculate with accuracy, efficiency, and understanding.

Lori Ramsey

@loriramsey1998

Math Solutions, Austin, Texas

Diane Reynolds

Math Solutions, Austin, Texas

Marriott Marquis, Independence Ballroom A-C (Level M4)













9:45 A.M.-11:00 A.M.

43 CCC

From Order of Operations to Function Composition with Bootstrap

6-8 Workshop

Order of operations never seems to "stick" for students, and teachers find themselves re-teaching and reviewing it every year. At the same time, students struggle to make the leap to functions and function composition. Find out why these two obstacles are connected, and discover a promising approach that kills both birds with one stone.

Emmanuel Schanzer

Brown University, Providence, Rhode Island

Walter E. Washington Convention Center, 143 AB

44 TLC

Have You Ever Had Food Poisoning?

8-10 Workshop

Ever wondered what you ate that caused you to have food poisoning? Come and join an engaging STEM simulation for food poisoning adapted from the CDC while building your students conceptual understanding. See how ratios, two-way tables, and probability are applied to figure out the contaminant.

Ashley Clody

mathedashley

Cobb County School District, Marietta, Georgia

Michelle Mikes

Cobb County School District, Marietta, Georgia

Marriott Marquis, Liberty Ballroom I-K (Level M4)

45 TECH

How Orchestrating Technology Promotes Critical Thinking and Engagement in Middle Grade Classrooms?

6-8 Workshop

Teaching with technology to promote student understanding involves a careful pedagogical orchestration. We will share how such pedagogical approach enhanced one teacher's practices to engage grade 6 students in meaningful conversations, and lead to deep understanding of the concept of ratios. Bring your laptop, we'll get our hands dirty.

Hagit Sela

University of Florida, Gainesville

Robert Wagner

University of Florida, Gainesville

Walter E. Washington Convention Center, 147 A

46 ASSESS

Juggling Formative Assessment to Differentiate Math Instruction in the Pre-K–2 Classroom

Pre-K-2 Workshop

Learn to use the formative assessment process in a fun, interactive activity-juggling! Participants will be introduced to the five steps of formative assessment, apply those steps to the pre-K-2 student's mathematical learning, and then plan next steps for instruction.

Karen Lounsbury

University of South Carolina Upstate, Belmont, North Carolina

Walter E. Washington Convention Center, 144 ABC

Visit **NCTM Central** and join your peers in the math education community exploring new resources, renew your NCTM **membership**, shop the latest titles in the **Bookstore**, learn about grant funding through the **Mathematics Education Trust**, connect with colleagues in the **Networking Lounge**, and engage in presentations and math circles.













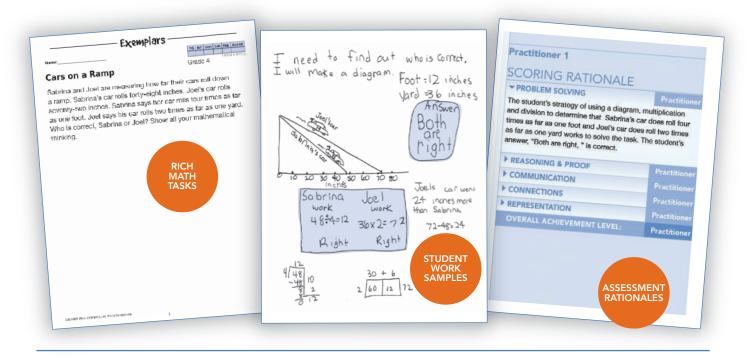


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- 800+ open-ended performance tasks to develop and assess students' critical thinking and reasoning skills.
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- Assessment rubrics provide teachers with clear guidelines for evaluating their students' understanding and providing meaningful feedback.
- Differentiated tasks for instruction, exploration and formative assessment.
- Corresponding summative assessments include student anchor papers and scoring rationales.
- Student rubrics provide a tool for self- and peer-assessment.
- Customizations available for CCSSM and non-CCSSM based curriculums.

47 MODEL

Math as the New Civics (aka: Teach Math, Save Democracy)

8-10 Workshop

As a country, we seem increasingly unable to discuss issues that matter. Fortunately, math is the language of logic, and math class is a place where students can discuss important topics thoughtfully and respectfully. In this workshop, we'll explore one such topic from a variety of perspectives . . . and reveal how democracy depends on math teachers.

Karim Ani

₩@karimkai

Mathalicious, Austin, Texas

Walter E. Washington Convention Center, 201

48 TLC

Mathematics for Elementary Students: Engaging ALL Learners

3-5 Workshop

In this workshop, the Framework for Engagement with Mathematics (FEM) will be presented. This research-based framework will be explored and illustrated via a range of engaging and hands-on mathematical tasks. Participants will investigate the tasks and discuss how they engage and provide opportunities for differentiation and assessment.

Catherine Attard

₩@attard c

Western Sydney University, Australia

Walter E. Washington Convention Center, 207 B

49 NEW T

New Teacher Strand Kickoff

General Interest Workshop

Do you have questions on how to make it all work? Together we have answers and ideas on management, parents, homework, keeping your sanity, and more. Join other early career teachers and those still in school to learn some strategies for addressing your most pressing problems. We'll have prizes, and good ideas! All welcome!

David Barnes

National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, 202 B

50 A&E

Problem-Based Enhanced Language Learning: Using Real-World Math Situations to Engage All Learners

6-8 Workshop

In this session, you will experience a problem-based lesson that fosters critical thinking, collaboration, mathematics discourse, and ELL strategies in a middle school classroom. You will learn ways to ensure your culturally and linguistically diverse learners have access to rigorous content as well as opportunities to develop academic language.

Silvia Aparicio

Arizona State University, Tempe

Stephanie Lund

Arizona State University, Tempe

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

51 MODEL

Project Runway: Mathematical Modeling through Rich Tasks

3-5 Workshop

Are you tired of being a lazy teacher? Participants will learn how to create rich mathematical tasks that meet the needs of every learner, establish a classroom culture centered around problem solving and student discourse, and promote the use of student modeling to represent real-world situations helping them make sense and understand math.

Jake Hartley

@JakeHartley_nkc

North Kansas City Schools, Missouri

Leah King

North Kansas City Schools, Missouri

Walter E. Washington Convention Center, 101













52 MODEL

Random Thoughts: Fun, Easy-to-Code, Math Models from Flipping Coins to Wandering Aliens

3-5 Workshop

Mathematical models in the form of student-created computer programs provide a fruitful framework for deep computational thinking and discussion. Focusing on random number generation, learn to coach your students in coding (via Scratch) easy, real-world, visual models addressing size, speed, heading, coordinates, frequency, and more!

Camille McCue

Adelson Educational Campus, Las Vegas, Nevada

Rachel Ziter

Adelson Educational Campus, Las Vegas, Nevada

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

53 CCC

Sequences and Series: Using Photos to Look for Patterns in a National Sculpture Garden Pyramid

10-12 Workshop

LeWitt's Four-Sided Pyramid is located in the Sculpture Garden, a fifteen-minute walk from the convention center. Using photos, we will investigate patterns to find three sequences to determine the number of blocks in the sculpture. This challenging problem gives students an opportunity for meaningful mathematical discourse on a non-routine problem.

Mike Koehler

Blue Valley North High School, Kansas City, Missouri

Walter E. Washington Convention Center, 152 B

54 MODEL

Should I Insure My Phone? Games and Mathematics for Modelling Risk

10-12 Workshop

When facing risk, we need to use math to make good decisions by calculating expected value. In this workshop, play a series of dice games to model decisions around purchasing different kinds of insurance and look at how using expected value informs these questions. Participants will receive classroom-ready activities they can use in their teaching.

Philip Dituri

Fordham University, New York, New York

Jack Marley-Payne

FiCycle, New York, New York

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

55 TLC

Space for Reasoning in Special Education: Bridging Instead of Filling Skills Gaps

8-10 Workshop

In our district, students with specific learning disabilities are provided instruction that allows them to create mathematical understandings by engaging with other students, motivated by curiosity, and with classroom discourse that is centered on students' ideas. We will share the philosophy behind our efforts and strategies we use.

Libby Butler

y
@drlibbybutler

Escondido Union High School District, California

Michelle Jilly

Escondido Union High School District, California

Walter E. Washington Convention Center, 151 B



Create your personal schedule using the online conference planner by visiting nctm.org/planner













56 TECH

Strategic Use of Free Online Technology Tools for Exploring Statistics in Algebra 1

8-10 Workshop

Experience activities that you can do with students, both with and without technology, involving statistical representations, measures of spread and variability, normal curves, scatterplots, and linear regression. You will explore a variety of free online apps and websites that provide visual and dynamic representations of statistics concepts.

Andres Marti

San Francisco Unified School District, California

Walter E. Washington Convention Center, Salon H

57 PROF

The Coach, The Novice, and The Expert

Coaches/Leaders/Teacher Educators Workshop

NCTM's *Principles to Actions* advocates for teachers to understand what students know and need to learn and then challenge and support them to learn it well. Coaches apply this principle to teachers. In this session, participants will explore the different philosophies of coaching and determine ways to promote the expert and train the novice.

Barbara Everhart

y@berealcoach

Education Consultant, Minneapolis, Minnesota

Walter E. Washington Convention Center, 149 AB

58 TLC

The Key to Solving Word Problems Is NOT Keywords!

Pre-K-2 Workshop

What are keywords anyway? Does circling and underlining really help students solve word problems? There is a better way! We will connect literacy strategies to increase students' comprehension and explore tasks that allow students to think their way to a solution rather than rely on faulty keywords, even for our youngest learners.

Lynn Girolamo

y:... Gil Gidillo **y** @LMGirolamo

Greece Central School District, Rochester, New York

Marriott Marquis, Independence Ballroom E (Level M4)

59 A&E

Tips for Working with English Learners in Mathematics

Coaches/Leaders/Teacher Educators Workshop

Coaches and teachers will be lead through a rich mathematical task designed to ensure access for English learners at all levels. Presenters will facilitate discussion, sharing tips on how to support students by building background knowledge, using sentence frames, adapting word problems, and more!

Erin Sylves

Fairfax County Public Schools, Virginia

Nichole Lindgren

Fairfax County Public Schools, Virginia

Walter E. Washington Convention Center, 204 AB

60 ccc

Transforming Your Textbook: Empowering You, the Teacher

8-10 Workshop

Transform the questions in your textbook to higher-level questions and tasks today! Looking at the depth to which your standards require, how can you get the most from your students with a single question? Using the Common Core State Standards and their Standards for Mathematical Practice, we will create question prompts and tasks to engage your students.

Melanie Janzen

★@MelanieJanzen15

San Bernardino County Superintendent of Schools, California Catherine Vittorio

San Bernardino County Superintendent of Schools, California

Walter E. Washington Convention Center, Salon H













61 PROF

Writing Is Sharing: Write for **Mathematics Teacher!**

10-12 Workshop

Teachers are creators: We create lessons and activities every day. Our best creations should be shared. Editors of The Back Page, Mathematical Lens, and the Calendar in *Mathematics Teacher* will help workshop participants turn their best creations into publishable form. Bring your ideas with you, and plan to walk out with an outline of an article!

Margaret Coffey

Thomas Jefferson High School for Science and Technology, Fairfax, Virginia

Ron Lancaster

University of Toronto, Ontario, Canada

Roger Day

Illinois State University, Normal

Marriott Marquis, Capitol/Congress (Level M4)

11:00 A.M.-12:00 P.M.

62 PROF

"Hidden Figures": Addressing Gender and Racial Biases

General Interest Session

"Hidden Figures" is the story of three black women mathematicians who were an essential part of NASA's early space missions. Participants will analyze the portrayed gender and racial biases shown. The participants can use the activities presented with their colleagues and/or students from grades six to those in professional development.

Judith Jacobs

JEJMath Ltd., Ann Arbor, Michigan

Diana Sherman

University of Michigan, Ann Arbor

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

Are Your Students Learning What You **Intend? Effective Uses of Open Ed** Resources

6-8 Session

Learn about MathMapper 6-8, a tool for organizing open ed resources and assessing student progress along learning trajectories. We describe a sixth-grade unit on ratios to share a model for building coherent curricula, evaluating materials, and supplementing them with quality activities. We show how this model leads to significant learning gains.

William McGowan

North Carolina State University, Durham

Michael Belcher

North Carolina State University, Durham

Meetal Shah

Durham, North Carolina

Walter E. Washington Convention Center, Salon I

TLC

Building Fluency through Problem Strings and Math Talks

Pre-K-2 Session

Do you have students who don't get math? Some students create strategies on their own, others don't. Let's use problem strings and math talks to build fluency for all. Problem strings make strategies intuitive and math talks can get the most struggling learner talking. No more mad minutes—let's use strategies to grow fluency in all students.

Brittany Goerig

@BGoerig

Educational Service Center Region 10, Richardson, Texas

Walter E. Washington Convention Center, 204 C













65 TLC

Building Procedural Fluency through Conceptual Fluency: Quadratic Functions

8-10 Session

Work with different ways to solve quadratic equations, and connect these methods to create procedural fluency with conceptual understanding. Be part of a lesson on factoring, graphing, and completing the square that models asking productive questions and using evidence of student thinking to adjust instruction and to assess student progress.

Frederick Dillon

₩@fdizzle1955

Institute for Learning, University of Pittsburgh, Pennsylvania Kyle Eller

Wheaton Warrenville South High School, Illinois

Walter E. Washington Convention Center, 145 AB

66 TLC

Challenging Math Problems Worth Solving

6-8 Session

Learn about practical implementation options for using rigorous problems that build students' conceptual understanding and procedural skills. You'll love how they remain accessible enough for your struggling students yet simultaneously challenge the most advanced students you've ever taught. Download free ready-made problems or make your own.

Robert Kaplinsky

@robertkaplinsky

Downey Unified School District, California

Walter E. Washington Convention Center, Ballroom B Reflection Cove following presentation.

67 TLC

Full STEAM Ahead: Engaging, Empowering, and Educating Students with Interactive (Statistics) Songs!

General Interest Session

NSF, NEA, and Kennedy Center projects have used STEAM to reach diverse students. Our NSF-funded Project SMILES created 22 "interactive songs" for teaching intro statistics, and our approach applies also to other STEM courses. We share our guiding criteria, discuss field trials on engagement and effectiveness for learning, and discuss tips for use.

Lawrence Lesser

The University of Texas at El Paso

Dennis Pearl

Columbus, Ohio

John Weber

Perimeter College at Georgia State University, Clarkston

Walter E. Washington Convention Center, 154 AB

68 A&E

Critical Care in College Algebra: The Connection between Care, Achievement, and Student Demographics

Research Session

You can be the teacher who cares for students, and students will learn more! Caring is an important quality of any teacher, but come see how care can be directly tied to increased learning, especially in students of color. We give the example of a college algebra class with modeling, but you will extrapolate to your own setting during the session.

Nathan Earley

University of Minnesota, Minneapolis

Kyle Whipple

University of Minnesota, Minneapolis

Walter E. Washington Convention Center, 102 AB













69 CHANGE

Critical Conversations to Catalyze Change in High School Mathematics

8-12 Session

All change begins with that first critical conversation. Join us for a collaborative discussion around the key recommendations and actions in *Catalyzing Change*. Leave with actions, ideas, and a new personal network that supports further conversation at the local level and sparks the potential for real change in high school mathematics.

Jennifer Curtis

Consultant, Durham, North Carolina

Damarrio Holloway

Discovery High School, Lawrenceville, Georgia

John Staley

Baltimore County Public Schools, Maryland

Walter E. Washington Convention Center, 150 A

Reflection Cove following presentation.

70 ASSESS

Differentiating Your Assessments— Easier Than You Think!

10-12 Session

Come to this session and find out how easy it is to change your assessments toward a student centered model. In the past, I would assess students with quizzes, tests, and then a final exam; however, is this best for students? In the last eight years, I have challenged this model and come and find out how easy it is to change!

Dave Martin

¥@d martin05

Red Deer Catholic, Alberta, Canada

Walter E. Washington Convention Center, 147 B

71

TLC

Do Nows, Done Better! Powerful, Productive and Engaging Lesson-Opening Strategies for All Classes

10-12 Session

Learn how to build confidence, competence, and interest using 12 strategies designed to fortify the first five minutes of any class. These field-tested no-cost techniques include using quotes, essential questions, foreign language texts, explorations, historical facts, partner problems, problem posing, quizzes, and more. Samples will be distributed.

Richard Sgroi

Retired, Bedford Schools, Rhinebeck, New York

Robert Gerver

Retired, North Shore Schools, Kings Park, New York

Walter E. Washington Convention Center, 202 A

72 PROF

Empowering Teachers: Connecting Teacher Practice and Student Learning with Coaching

Coaches/Leaders/Teacher Educators Session

In this session, you will discover how coaches can empower teachers and teachers can empower students by focusing on NCTM's *Principles to Actions*' teaching practices. You will explore a set of coaching tools you can use to support teachers in connecting their teaching and students' opportunities to demonstrate the Standards for Mathematical Practice.

Maggie McGatha

y∕@mcgatha

University of Louisville, Kentucky

Jennifer Bay-Williams

University of Louisville, Kentucky

Marriott Marquis, Liberty Ballroom N-P (Level M4)













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ATH IS ALL AROUND US : **Math is all around us** : Math is all around us : Math is all around us

NEW | Access and Equity: Promoting High-Quality Mathematics in Grades 6-8

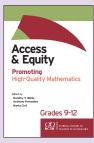
MARTA CIVIL, SERIES EDITÓR

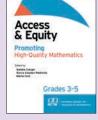
FDITED BY ANTHONY FERNANDES, SANDRA CRESPO, AND MARTA CIVIL

Put NCTM's Access and Equity Principle into practice with the strategies and resources in this book Practice-based vignettes open each chapter, inviting readers to relate to and engage with the issues of access and equity discussed in the middle school mathematics classroom. Questions at the end of each chapter encourage readers to reflect on what they have learned and then take action in adapting the suggested approaches.

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ALSO AVAILABLE





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Taking Action

NEW | Taking Action: Implementing Effective Mathematics Teaching Practices. Grades 6-8

MARGARET SMITH, SERIES EDITOR

BY MARGARET SMITH, MICHAEL STEELE, AND MARY LYNN RAITH

This Taking Action series book examines in depth what applying effective mathematics teaching practices would look like in a middle school classroom, with narrative cases, classroom videos, and real student work. It presents a rich array of experiences that bring the practices to life.

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NEW | A Fresh Look at **Formative Assessment** in Mathematics Teaching

BY EDWARD A. SILVER AND VALERIE L. MILLS

A Fresh Look at Formative Assessment is designed for educators who wish to improve mathematics teaching and learning. It highlights the important role that formative assessment plays in many of the instructional frameworks of mathematics education. It

provides examples of where and how formative assessment can be integrated into daily instructional decision-making.

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NEW | 5 Practices for Orchestrating Productive Mathematics Discussions, **Second Edition**

BY MARGARET S. SMITH AND MARY KAY STEIN Copublished with Corwin Press

This second edition of 5 Practices provides a model for facilitating discussions in mathematics classrooms based on the thinking of students. In response to teacher feedback on the first book.

this new edition expands the discussion of lesson planning and provides more guidance on assessing and advancing questions.

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BY CATHERY YEH, MARK W. ELLIS, AND CAROLEE KOEHN HURTADO

Reimagining the Mathematics Classroom presents a comprehensive systems approach to examining mathematics teaching. It synthesizes and illustrates current research on the essential elements of mathematics teaching and learning, unpacking each component,

including classroom physical space. Tips on using technology to assess and enhance learning are embedded throughout the book.

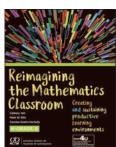
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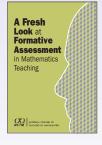
NEW | Unpacking Fractions: Classroom-Tested Strategies to Build Students' Mathematical Understanding

MONICA NEAGOY

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ractices

NEW | Catalyzing **Change in High School Mathematics: Initiating Critical Conversations**

Catalyzing Change

in High School Mathematics

Initiating Critical Conversations

Catalyzing Change identifies and addresses critical challenges in high school mathematics to ensure that each and every student has the mathematical experiences necessary for future success.

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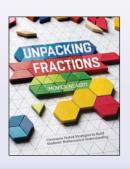
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73 TLC

Engaging Students in Statistics Using a Flipped Classroom

Higher Education Session

Discover how to engage students in a statistics classroom using the flipped classroom model. This presentation will include examples of activities used during class time and video clips of students participating in active mathematical discourse. We will also discuss how the flipped classroom model promotes equitable teaching practices.

Emily Dennett

y @Emilyndennett

Central Ohio Technical College, Newark

Walter E. Washington Convention Center, 103 B

74 TECH

Engaging Students in the Standards for Mathematical Practice through Robotics and Programming

Pre-K-2 Session

Work with robotics provides powerful opportunities for young students to actively collaborate and problem solve. In this interactive session, we will explore how students use easily programmable robots to uncover rich mathematics and engage in the mathematical practices. Participants will leave with ideas they can implement in their own classrooms.

Michael Flynn

@MikeFlynn55

Mount Holyoke College, South Hadley, Massachusetts

Walter E. Washington Convention Center, 152 A

5 CCC

How Do You Teach Stats? Let's Incorporate a Coherent Plan for the Stats Progression in Your Class

8-10 Session

Do you need help teaching CCSS stats in grades 8–12? Would you like to see and participate in some activities that promote understanding the statistics standards? Come spend an hour with us to see activities that truly follow the Statistics Progression. Are you teaching the traditional way or following the integrated model? Either way we can help!

Chad Shepherd

Pontiac Township High School, Illinois

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

76 CCC

How Many Degrees are in a Martian Circle? And Other Human—and Nonhuman—Questions One Should Ask!

General Interest Session

In this session, we'll go through a sample of interesting tidbits from the development of mathematics that bring the human story of the subject to the curriculum. We'll attend to many of the specific questions that students and teachers naturally and joyously ask when given the permission to do so.

James Tanton

@jamestanton
MAA, Phoenix, Arizona

Walter E. Washington Convention Center, Ballroom A

Explore the Exhibit Hall for the latest educational resources.















77 TECH

Investigating Real-World Data with Online Visualization Tools: Building Future Data Scientists

8-10 Session

Make the teaching of statistics and probability topics interesting and engaging for students as they tackle real world investigations with "larger and messier" data sets. Bring your tablet or laptop and engage as we highlight how easy it is to get students hooked in as data scientists and use the free online dynamic statistics tool CODAP.

Hollylynne Lee

North Carolina State University, Raleigh

Gemma Mojica

North Carolina State University, Raleigh

Christina Azmy

North Carolina State University, Raleigh

Walter E. Washington Convention Center, 140 AB

78 TLC

Numbers Are Numbers. Why Treat Fractions and Decimals Differently?

3-5 Session

Why do teachers fall back to using abstract algorithms for multiplying fractions and decimals? Learn a progression of models and strategies for developing conceptual understanding of multiplication with whole numbers and apply those models and strategies to fractions and decimals.

Kevin Larkin

Pinellas County Schools, Florida

Adrienne DeLong

Pinellas County Schools, Largo, Florida

Marriott Marquis, Independence Ballroom D (Level M4)

79 MODEL

One Person, One Vote? Model Voter Power in Redistricting with High School Geometry and Statistics

10-12 Session

Participants will investigate mathematical models from current court cases to measure voter power through an interactive activity that can be adapted to use in a high school class. The models attempt to evaluate the "fairness" of redistricting proposals. Legal constraints will be highlighted. All students can become powerful and informed voters.

Linda Saeta

y @LindaSaeta

Claremont Unified School District, California

Walter E. Washington Convention Center, 146 A

80 PROF

Preparing Culturally and Needs-Responsive Teachers through Mathematics Education

Coaches/Leaders/Teacher Educators Session

Presenters in this session will model processes and strategies used by a university and a district to build teacher capacity for professional growth and advocacy in preparing culturally and needs-responsive teachers through mathematics education and Common Core State Standards implementation.

Andrea Hajek

y @AndreaHajek

National Board for Professional Teaching Standards, Arlington, Virginia

Kaulu Gapero

Kamehameha Schools, Keaau, Hawaii

Walter E. Washington Convention Center, 203 AB















A new K-5 intervention program



Bridges Intervention provides targeted instruction and support, addressing Tier 2 within the RTI framework. Each volume contains activities, games, and practice pages that can be used for re-teaching key numeracy skills and concepts. Placement and progress monitoring assessments are included.

Stop by booth 241 to learn more.

81 TLC

Raising the Bar: Lifting Students by Learning from Their Views on Mathematical Strengths

6-8 Session

The session describes the work of a professional learning community to create classroom activities to solicit middle school students' views of mathematical strengths. Presenters will share the design process, students' initial responses, ways these responses shifted as students interacted with each other, and lessons learned to improve instruction.

Carlos Nicolas Gomez

★@GomezMathEd

Clemson University, South Carolina

Frederic Rushing

Coile Middle School, Athens, Georgia

Jason Pratt

Hilsman Middle School, Athens, Georgia

Walter E. Washington Convention Center, 151 A

82



Surviving and Thriving in Your Math Classroom!

General Interest Session

John is in his third year of teaching secondary math, while his father, Dan, is in his thirty-fifth year. They will share thoughts on how professional growth is a career-long endeavor as well as practical ideas for the classroom.

Daniel Brahier

Bowling Green State University, Ohio

John Brahier

Perrysburg, Ohio

Walter E. Washington Convention Center, Ballroom C Reflection Cove following presentation.

83



Teaching Geometry through Dance

6-8 Session

Are you looking for something new and exciting to spark student interest in geometry? Grab your most comfortable dancing shoes because in this session, participants will explore how folk dancing can be used to teach and reinforce geometric properties. All attendees will receive a packet of materials as well as digital resources.

Lucia Schaefer

District of Columbia Public Schools, Washington, D.C.

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

84 TLC

Teaching Mathematics Online Using Inquiry Methods

General Interest Session

An increasing number of students are now receiving a significant portion of their math education online. There are both opportunities and challenges when teaching and learning mathematics in a virtual setting. Session participants will learn how Inquiry methods foster engagement and productive learning for students in an online environment.

Brian Ridpath

Nevada Virtual Academy, Las Vegas

Walter E. Washington Convention Center, Salon G

35 TECH

Technology That Thinks WITH Students, Not FOR Students

8-10 Session

Technology wears two faces. With one, it amplifies student thinking and creativity. With the other, it thinks and creates FOR the student, dazzling or grading them without inspiring or educating. We'll look at easy and free technology—including handheld calculators, Sketchpad, and Desmos—that thinks WITH you and your students, not FOR them.

Eli Luberoff

™@eluberoff

Desmos, Inc., San Francisco, California

Walter E. Washington Convention Center, Salon C













86 A&E

The Universal Language of Mathematics (Yes, We Do Write in Math Class)

General Interest Session

Do your students protest "But this is math class!" when you ask them to write? Constructing viable arguments is just as important as accurate computation. We will discuss the difficulties students have, explore practices to elicit student language and learn how to adapt activities to your populations (including ELLs and students with disabilities).

Tina Cardone

❤️@crstn85

Salem High School, Massachusetts

Marriott Marquis, Liberty Ballroom M (Level M4)

87 TLC

Three Critical Components for Achieving Rigor

Coaches/Leaders/Teacher Educators Session

Rigor in mathematics includes a focus on concepts and procedures. It is widely acknowledged that to achieve rigor concepts should be addressed first. This is a challenge. Explore three critical components demonstrated as essential for achieving rigor in K–grade 12. Make sense of the three components through tasks, classroom video, and discussion.

Juli Dixon

★@thestrokeofluck

University of Central Florida, Orlando

Walter E. Washington Convention Center, 146 B

38 CCC

Understanding Geometry and Measurement Pre-K-2: Facilitating Coherence and Connections

Pre-K-2 Session

Do you see geometry content as extra, "only if you have time" activities? Presented by the author of *Putting Essential Understanding of Geometry and Measurement into Practice for Pre-K-2*, this session will highlight the connections between the Essential Understandings and the different grade levels using student samples and classroom video clips.

Juanita Copley

Professor Emerita, University of Houston, Texas

Marriott Marquis, Liberty Ballroom L (Level M4)

89 TLC

Use Discourse to Access Language and Mathematics for English Learners

General Interest Session

Discourse in the classroom will increase English learners' productive and receptive language functions and their comprehension of mathematics concepts. All students need to reason, construct viable arguments, and critique the reasoning of others. Increasing discourse will support students' language development as they engage in these practices.

Susie Hakansson

Mathematics Education Consultant, Venice, California

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)

90 TECH

Using the iPad to Effectively Explore a Rich Trigonometric Task in Advanced Algebra or Precalculus

10-12 Session

We will combine both hands-on paper and pencil work with the power of the N-SPIRE graphing tool on the iPad to explore a rich task from a Trigonometry class. Participants will need only a little experience with either the iPad or the N-SPIRE app to be successful in this workshop. And could use a limited background with graphs of sine curves.

Arthur Mabbott

y@MathguyArt

Scholars On-Line, Woodinville, Washington

Marriott Marquis, Independence Ballroom F-H (Level M4)













91 PROF

What Does the Past Tell Us about the Future in Mathematics Education?

General Interest Session

What can we make of a pendulum swinging from since NCTM's Agenda for Action was released until today? What lessons can we learn to guide us in the future? Is our progress commensurate with our efforts? These and other questions will form the basis of a dialogue about lessons learned from a front row seat in mathematics education for nearly forty years.

Linda Rosen

Change the Equation, Washington, D.C.

Diane Briars

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Consultant, Pittsburgh, Pennsylvania

Zalman Usiskin

University of Chicago, Illinois

Lee Stiff

Past President, National Council of Teachers of Mathematics, Reston, Virginia; North Carolina State University, Raleigh

Walter E. Washington Convention Center, 146 C

91.1 **ew** TLC

How to Teach Math through Anchor Tasks

Pre-K-2 Exhibitor Workshop

Good tasks allow the attainment of learning outcomes and enable teachers to challenge advanced learners while taking care of the rest of the class. Participants will pick up ideas and suggestions on how to kick off each lesson with an Anchor Task to provide students with opportunities for exploring different methods of solving a problem.

Shing Lee Publishers

Singapore

Walter E. Washington Convention Center, 143 C

91.2 **CW** MODEL

Escape Room Adventures for Grades K-8

General Interest Exhibitor Workshop

Put your problem-solving and teamwork skills to the test to unlock the clues and solve the mystery to escape! Strategies and cooperation are critical to success in this challenge. Experience problem-solving and mathematical modeling activities in this lively and challenging Escape Room context that you can use in your classroom!

Pearson Learning Services

Chandler, Arizona

Walter E. Washington Convention Center, 158 AB

91.3 **EW** TLC

Steps to Success: Blending Discourse, Conceptual Understanding, and Reasoning in Elementary Math

Coaches/Leaders/Teacher Educators Exhibitor Workshop

Goals: Student conceptual understanding; focus on student thinking; Increase teachers' math knowledge. Solution: Stepping Stones. Learn about the ORIGO teaching model from co-founder James Burnett and experience a lesson. Hear from current Stepping Stones users about implementation strategies and success building a strong elementary math program for all.

ORIGO Education

Earth City, Missouri

Walter E. Washington Convention Center, 143 C

91.4 **ew** Tech

BYOD: Mathspace—Why You'll Never Grade Math Assignments Again. Seriously.

General Interest Exhibitor Workshop

Meet Mathspace. You've seen it all, right? Adaptive learning? Yep. Handwriting recognition? Hmm. Every math question graded line-by-line? Whoa, that's new! Students can finally show their work, and get feedback at every step—all auto-graded for you. Bye-bye, multiple choice! BYOD to try the award-winning Mathspace live, and ask about a free trial.

Mathspace

New York, New York

Walter E. Washington Convention Center, 156













92 TLC

"Reverse Tasks" for Deeper Conceptual Understanding

Coaches/Leaders/Teacher Educators Burst

Content tasks often have a format of giving "initial conditions" and asking for a computational result or interpretation from them. "Reverse tasks" aim to strengthen conceptual knowledge by giving a desired result and asking learners to construct appropriate initial conditions. This talk shares non-algebraic "reverse tasks" for future teachers.

J Lyn Miller

Slippery Rock University, Pennsylvania

Walter E. Washington Convention Center, 101

93 ISSUES

A Bridge to Algebra I: Optimize Students' Learning Experiences as They Transition to Algebra

8-10 Burst

Are you teaching a course designed to bridge eighthgrade math content and algebra I? Although there are various ways to plan and teach the content, there are also misconceptions about the intentions of such a course. Come discuss content connections between a foundations course and algebra I and share strategies to make instruction count!

Pamela Rayburn

Madison County Schools, Mississippi

Marriott Marquis, Capitol/Congress (Level M4)

94 TLC

Alternative Algorithms and Place Value Understanding

Pre-K-2 Burst

Assessments will be shared that will help teachers diagnose their students' understanding of place value. Manipulative uses for anchoring tens for the numbers between 11 and 20 and then numbers beyond 20 will help teachers prepare students for various alternative algorithms for addition and subtraction. "Number Talk" videos will also be shared.

Kim Hartweg

Western Illinois University, Macomb

Walter E. Washington Convention Center, 207 A

95 A&E

Community Organizations as a Vehicle to Learn Advanced Algebra and Statistics

General Interest Burst

Participants will explore ways in which statistics topics can be applied to real-world situations provided by a community organization. Specifically, participants will analyze and explore the ways in which a statistics class used the environmental concerns of a community organization to learn about descriptive statistics and standard deviation.

Salvador Venegas

Infinity Math, Science and Tech High School, Chicago, Illinois

Walter E. Washington Convention Center, 151 B

96 PROF

Connecting and Becoming Stronger Advocates through Affiliates

General Interest Burst

NCTM membership and Affiliate Relations Committee supports affiliates individually and collectively to advocate for high-quality mathematics education. We will respond to survey results and ask participants to reflect on affiliate strengths, develop one affiliate goal for the upcoming year, revisit goals from NCTM Affiliates Leaders' Conference, and share ideas.

Catherine Boutin

John F. Deering Middle School, West Warwick, Rhode Island

Becky Walker

CESA 7, Green Bay, Wisconsin

Joanie Funderburk

Student Achievement Partners, Parker, Colorado

Walter E. Washington Convention Center, 207 B













Bloom into Spring with NCTM

Nurture Your Career—Upcoming Webinars

Dive deeper into relevant topics in one of NCTM's upcoming webinars.

The Early Bird Gets the Worm—Conferences and Events

Catch the best rates with early-bird registration for fall events or customized professional development.

A Bouquet of Options—Classroom Resources

- **Resource Libraries on MyNCTM** provide curated libraries for elementary, middle, and high school resources organized by grade and topic. Click on a folder to expand and double-click on a resource to the right.
- Activities with Rigor and Coherence is a series of lessons that addresses mathematical topics and supports effective teaching practices.

Reading for a Rainy Day—Featured Books





Counting Is as Easy as 1,2,3 . . . or Is It?

Pre-K-2 Burst

Participants will discover the complexities of learning to count by participating in a simulation of the learning to count process in order to develop a deep understanding of what is required for young children to learn this critical, foundational skill. Additionally, participants will leave with activities and routines for use in their classroom.

Susan Looney

@looneymath

Looney Math Consulting, North Easton, Massachusetts

Heather Johnson

Looney Math Consulting, North Easton, Massachusetts

Walter E. Washington Convention Center, 147 A

MODEL

Creating a Collaborative Mathematics Classroom

8-10 Burst

Deepen your understanding of how to create a collaborative mathematics learning environment and examine what effective collaboration looks like in the classroom. Learn how best to implement learning strategies, such as discussion groups and sharing-andresponding. Then engage in purposeful planning with collaboration in mind.

Katie Sheets

@MrsKatieSheets

Sioux Falls School District, South Dakota

Brenda Green

The College Board, New York, New York

Walter E. Washington Convention Center, 206

Inside the Ice Cream Cone or Out?: **Tangible Tenants for Teaching Engaging, Student-Centered Math**

6-8 Burst

This session will present an engaging lesson on volume of 3-D shapes to demonstrate/discuss strategies for creating active student engagement and rich mathematical discourse. This session will highlight the advantages and challenges of creating engaging task in the math classroom and provide tangible tenants for teaching math using engaging task.

Patrice Waller

California State University, Fullerton

Richelle Kalman

California State University, Fullerton

Walter E. Washington Convention Center, Salon H



Is Equal Groupings It? Choose Your Own Pathway for Multiplication Using Tools, Models, and Strategies

3-5 Burst

Repeated addition. Equal groupings. Distributive property. Teaching multiplication should not be string of ways to solve problem with leaps from one strategy to the next. This presentation outlines tools, models, and strategies to help teachers identify and choose appropriate pathways based upon where students are, opposed to where the textbook is.

Christine King

@ckingeducation

CKingEducation, Bridgeport, Connecticut

Walter E. Washington Convention Center, 209 ABC













101 ASSESS

It's Hip to Be Square: Assessing the Development of Geometric Reasoning

3-5 Burst

Let's look at how we can assess the development of geometric reasoning in children! Discussed will be open-ended geometry tasks and a framework for examining and better understanding children's thinking elicited in these tasks. We'll also talk about how we can use the information gathered from the students in lesson planning.

Thomas Fox

University of Houston-Clear Lake, Texas

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

102 TLC

Master PROOFS through Games!

8-10 Burst

We will share two successful game-based strategies for introducing, teaching, and understanding proofs in a geometry classroom.

Peter Sell

NYC Department of Education, Health Professions and Human Services High School, New York, New York

Paul Winston

NYC Department of Education, Health Professions and Human Services High School, New York

Walter E. Washington Convention Center, 150 B

103 CCC

Math and Sports: A High School Math Elective to Encourage College Readiness

10-12 Burst

A partnership between University and High School level teachers is described which focuses on a piloted, application-based course called "Math and Sports." The course is innovative in content and approach, providing students with collegiate-style material in a high school setting and exposing underrepresented groups to broad mathematical concepts.

Betsy McShea

Stockton University, Galloway, New Jersey

Judith Vogel

Stockton University, Galloway, New Jersey

Ryan Houlahan

Barnegat High School, New Jersey

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

104 PROF

Middle School Teacher in a Primary World: The Power of This Unconventional Partnership

Pre-K-2 Burst

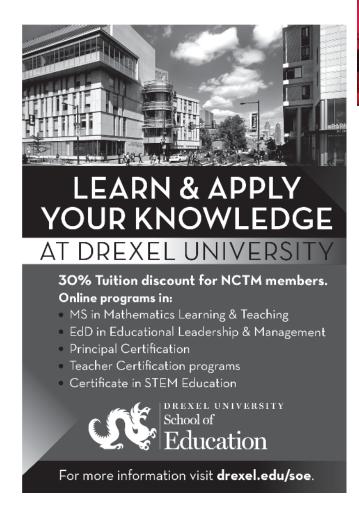
How do primary students learn math? This was the question I set out to answer when I went from middle school math teacher to K–8 instructional coach. I'll share my learnings from three K–2 classrooms. We brought some pretty sophisticated tech tools and class discussions to primary kids—and they rose to the challenge!

Annie Forest

@mrsforest

Berwyn South District 100, Illinois

Marriott Marguis, Marguis Ballroom Salon 4 (Level M2)















105 CCC

Once Upon a Time There Was a Word Problem: Using Story Elements to Teach Word Problems

Pre-K-2 Burst

When students struggle with comprehension, we do not tell them to circle characters' names or box the setting and expect this will make them good readers. So why do we think such procedures will make them good problem solvers? Join us to learn how to help students apply ideas and vocabulary from reading and writing to make sense of word problems.

Michelle Alperin

Rodeph Sholom School, New York, New York

Beth Green

Rodeph Sholom School, New York, New York

Cheryl Fricchione

Rodeph Sholom School, New York, New York

Walter E. Washington Convention Center, 143 AB

106 PROF

Order Up: Using Number Lines to Connect and Access Number Concepts across Grade Levels

Coaches/Leaders/Teacher Educators Burst

Working in three grade band groups (K–2, 3–5, 6–8), we will create number lines using index cards, paper clips, and rope. For each number line, we will place numbers according to the development of number concepts, from basic recognition to operations starting with counting numbers, then fractions, and then rational numbers in general.

Lauren Zarandona

Mississippi School for Math and Science, Columbus

Walter E. Washington Convention Center, 149 AB

07 TLC

Positive or Negative? Strategies for Teaching Integers in Grades 6–8

6-8 Burst

Why are integers so hard for students? In this burst, 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

@hlsabnani

Looney Math Consulting, Foxboro, Massachusetts

Molly Vokey

Looney Math Consulting, Mansfield, Massachusetts

Walter E. Washington Convention Center, 201

108 TLC

Preservice Teachers' Knowledge of Culturally Responsive Teaching during Mathematics Instruction

Higher Education Burst

Teaching preservice teachers to identify culturally responsive teaching techniques is challenging. To show true understanding of CRT and apply it is an ambitious task. The researchers focused on information and activities designed to cement knowledge and increase the likelihood that preservice teachers would actually use apply techniques.

Leah Herner-Patnode

The Ohio State University at Lima

Hea-Jin Lee

The Ohio State University at Lima

Marriott Marquis, Independence Ballroom E (Level M4)

Use **#NCTMannual** to stay connected with other attendees on Twitter, Facebook, and Instagram.















109 TLC Problem Solving Is More Than Solving Problems

Coaches/Leaders/Teacher Educators Burst

In a course on problem solving for middle grade majors, we cover a wide variety of topics. Not only do we cover problem-solving strategies, but also middle grades topics and how to teach them. In this session, we will discuss teaching strategies that have worked for us and those that have not. Join us to discuss how and why activities do and do not work.

Sharon Taylor

Georgia Southern University, Statesboro

Kathleen Mittag

Retired, University of Texas at San Antonio

Marriott Marquis, Liberty Ballroom I-K (Level M4)

110 MODEL

Teaching Mathematics Effectively through Mathematical Modeling in Early Grades

3-5 Burst

Making mathematics more meaningful and relevant for students is essential in mathematics education. In this presentation, we will discuss pedagogical strategies to help teachers implement and engage students with modeling activities. Learn about finding and adapting mathematical modeling tasks that will engage all students in the modeling process.

Reuben Asempapa

Penn State Harrisburg, Pennsylvania

Walter E. Washington Convention Center, 202 B

11 PROF

Teaching Mathematics in High-Need Settings with Focus on Place and Modeling

Coaches/Leaders/Teacher Educators Burst

As practitioners and researchers, we focus on school setting and mathematics content to prepare secondary mathematics teachers committed to teaching in highneed settings. We apply the scholarship of "place" to inform teaching while respecting similarities and differences across rural and urban places.

M. Kathleen Heid

Pennsylvania State University, University Park

Gina Foletta

Pennsylvania State University, University Park

Rose Zbiek

Pennsylvania State University, University Park

Walter E. Washington Convention Center, 144 ABC

112 TLC

What Does Effective Fraction Intervention Look Like in Middle School or Beyond?

6-8 Burst

These practical research-based ideas empower struggling learners by catching them up with fractions while maintaining access to grade-level content. Differentiation ideas are included too. A knowledgeable teacher is the best student pathway to success!

Mark Goldstein

Center for Mathematics and Teaching, Inc., Porter Ranch, California

Walter E. Washington Convention Center, 152 B

113 **CCCC**

The Progression of the Number Bond

Pre-K-2 Burst

Number bonds are models used to show part-part-whole relationships and can be used from K–5 as students manipulate whole numbers and decimal fractions. Having a familiar model as students move through the grades will help them conceptually understand the part-part-whole relationship as they work with increasingly complex math problems.

Soo Jin Lu

Great Minds, Washington, D.C.

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)













115 TLC

Writing to Develop Sense Making, **Reasoning, and Arguments**

Higher Education Burst

The first three Standards for Mathematical Practice emphasize the importance of sense making. Let's explore some writing tasks that are effective in developing students' ability to justify conclusions, evaluate the reasoning of others, communicate their thinking, and evaluate and reflect on progress. Example tasks and student work will be shared.

Susan Gay

University of Kansas, Lawrence

Ingrid Peterson

University of Kansas, Lawrence

Walter E. Washington Convention Center, 103 A

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12:00 P.M.-1:30 P.M.

Dedicated Exhibit Hall Time

1:30 P.M.-2:30 P.M.



Prealgebra: Geometry as a Conceptual

6-8 Session

Geometry can help contextualize algebraic thinking by providing both visual references and real-world practice for algebraic manipulations. In this session, we will look at why and how the strategies we use in geometry will catapult your students into greater fluency and deeper understanding with algebra.

Susan D'Souza

Independent Educational Consultant, Nicholasville, Kentucky **Britt Robinson**

Independent Educational Consultant, Hamlin, Iowa

Walter E. Washington Convention Center, 202 A

#StudentsTeachingStudents—Students Create Engaging Math Videos to Teach Concepts to Their Peers

10-12 Session

As a Ted-Ed Innovative Educator, Cohort Three, my Ted-Ed project is #StudentsTeachingStudents. In this session, I will show you how my students created video lessons using Explain Everything, Stop Motion, and/or iMovie to teach their favorite concepts. Your students can create a bank of rich math lessons for flipped classroom, remediation, or enrichment.

Lisa Winer

@Lisaqt314

Saint Andrew's School, West Palm Beach, Florida

Walter E. Washington Convention Center, 146 B













119 MODEL

A Model For All Seasons: Developing Computational Fluency with the Bead String

Pre-K-2 Session

Why is it so difficult for students to develop fluency in addition and subtraction? This session examines our work with a powerful mathematical model—the bead string. We will use video to explore & analyze a sequence of ten-minute mini-lessons that build students' ability to visualize and generalize the big ideas necessary to develop fluency.

Stephanie Slabic

Metamorphosis Teaching Learning Communities, New York, New York

Renee McShane

Metamorphosis Teaching Learning Communities, New York, New York

Carrie Orgera

Metamorphosis Teaching Learning Communities, New York, New York

Walter E. Washington Convention Center, Salon G

120 TLC



Being Right and Wrong in Different, Interesting Ways

8-10 Session

Effective open-ended questions give students opportunities to be right and wrong in different, interesting ways. Desmos gives teachers the opportunity to easily collect and display student responses to these types of questions. This session explores how to use these types of questions in Desmos to drive instruction and improve feedback to students.

Nolan Doyle

@ndoyle1015

Clover Hill High School, Midlothian, Virginia

Walter E. Washington Convention Center, 154 AB



Building Student Capacity in a Co-Teaching Classroom

6-8 Session

The teachers will use a parallel co-teaching model with the use of interactive notebooks to demonstrate how teachers can build the capacity of students with and without disabilities. The teachers will use the standard of ratio and proportions to facilitate the lesson. Participants will also learn how to structure an interactive notebook.

George Blackmon

Prince George's County Public Schools, Temple Hills, Maryland Renee Battle

Prince George's County Public Schools, Temple Hills, Maryland

Walter E. Washington Convention Center, 150 A

PROF 122

Concept Study as Professional Learning

Coaches/Leaders/Teacher Educators Session

Concept study (Davis and Renert 2014) is a form of professional development informed by complexity theory and weaves together features related to concept analysis and lesson study. Come and learn about the features of concept study, how teachers learn deeply about the mathematics they know, and how this understanding translates into their teaching.

Florence Glanfield

@fglanfield

University of Alberta, Edmonton, Canada

Walter E. Washington Convention Center, 103 B















Connecting Coaching and Collaborating to Develop Deep Understanding of Content

8-10 Session

How do we support fellow teachers to make sense of mathematics for teaching? Explore ways to structure planning and coaching opportunities to select and implement high cognitive demand tasks. Engage teachers to support students in high cognitive demand tasks through planning, implementation, and reflection to make sense of content with depth.

Edward Nolan

🏏@ed nolan

Towson University, Maryland

Walter E. Washington Convention Center, 147 B

124 TLC



Constructing Fractions as Countable Numbers: A Pathway to Fluency with Understanding

Research Session

Students count to develop a concept of whole numbers which leads to mathematical operations. See how fractions are developed as countable number concepts using research on student thinking. Connecting students' understanding of whole number operations and fractional operations leads to conceptual understanding and procedural fluency.

Brook Lewis

@BrookDLewis

AIMS Center for Math and Science Education, Fresno, California

Walter E. Washington Convention Center, 102 AB



Don't Forget Discrete Mathematics!

10-12 Session

Discrete mathematics is full of interesting, fun, and challenging problems that provide rich opportunities for mathematical reasoning. Explore ways to incorporate discrete problems into your secondary classroom—including how they can support the learning of other topics (e.g., algebra) while also providing a fresh perspective about "what is math."

Nicholas Wasserman

@DoctorWass

Teachers College, Columbia University, New York, New York

Marriott Marquis, Independence Ballroom D (Level M4)

126 ISSUES

Exploring the Literature of Mathematics

General Interest Session

The story of mathematics is one of the great quests of humanity, problems passed down through generations for thousands of years before they are solved. Though this story can be hard to access from the technical details of the classroom, it provides an inspiring motivation and a reminder that however alien the ideas seem they are fundamentally human.

Edmund Harriss

ず@Gelada

University of Arkansas, Fayetteville

Walter E. Washington Convention Center, Salon C

127 ASSESS

Formative Assessments in Geometry and Measurement: Putting Essential **Understanding into Practice**

3-5 Session

How can we know what our students know, and then use that knowledge to help them grow? Participants will examine tasks from Putting Essential Understanding of Geometry and Measurement into Practice for Grades 3–5 and analyze student work. The presenter will share the perspectives of an author, researcher, and fourth-grade teacher.

Dusty Jones

Sam Houston State University, Huntsville, Texas

Walter E. Washington Convention Center, 140 AB













128 A&E

Fostering a Growth Mindset for All Students

10-12 Session

The 2014 Kentucky High School Teacher of the Year will share how she develops and maintains a growth mindset to help all students succeed in her rural, low socioeconomic school. The strategies will focus on high expectations, student engagement, and an assessment system focused on growth to empower all students to achieve mathematical proficiency.

Joanna Stevens

@MrsStevensMath

Lincoln County High School, Lancaster, Kentucky

Marriott Marquis, Liberty Ballroom M (Level M4)



How to Desmo-fy Your Math Lessons to Guide Discovery and Promote Sense Making

8-10 Session

In this session, we will share ready-to-use activities that help students make sense of math by using Desmos to guide discovery and promote student engagement. We will also "pull back the curtains" and provide some helpful tips on using this tool so that you can build your own activities to promote critical thinking and conceptual understanding.

Ivan Cheng

@drivancheng

California State University, Northridge

Jaspreet Sandha

Los Angeles Unified School District, California

Matt Kim

Mission View Public Charter School, San Fernando, California

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)

130

Imagine That: The Unfortunate Naming of i

10-12 Session

Many students' first exposure to the imaginary unit results from studying quadratic equations. This session puts a new twist on the study of complex numbers by connecting them to geometric transformations which sets the stage for deep connections to advanced topics such as the polar form of complex numbers, matrices, and vectors.

Pam Goodner

@PGoodner

Eureka Math, Washington, D.C.

Walter E. Washington Convention Center, 203 AB

131

Making High-Yield Routines Work in Pre-K to Grade 2

Pre-K-2 Session

Are your daily routines helping students make sense of important mathematics? Explore routines that promise more bang for your buck, with higher returns in the realms of math practices, numeracy, and computational fluency delivered in small chunks of time. Number talks, Clothesline Math, and Which One Doesn't Belong are a few routines explored in this session.

Trish Kepler

@KeplerTrish

The Greenwich Country Day School, Connecticut

Walter E. Washington Convention Center, Salon I

132 A&E

Making It Our Own: Children, Teachers, and Families Claiming Mathematics

Pre-K-2 Session

Building on lessons learned in three studies (one focused on children's mathematics learning, one focused on families, and one focused on teachers' knowledge), we explore ways in which we as teachers can support students in making mathematics their own by drawing on all of their resources, particularly linguistic and cultural ones.

Ciristina Valencia Mazzanti

University of Georgia, Athens

Martha Allexsaht-Snider

University of Georgia, Athens

Walter E. Washington Convention Center, 146 A















NCTM's Resources for the Secondary Classroom

10-12 Session

As busy teachers, it can be hard to find the best resources for your classroom. NCTM offers members a wealth of high-quality resources from apps and online games to lesson plans and complete lesson arcs. Come learn about NCTM's online Classroom Resources collections for the secondary classroom.

AnnMarie Varlotta

∀@amvarlotta

Howard County Public Schools, Ellicott City, Maryland **Brian Shay**

San Dieguito Union High School District, San Diego, California

Marriott Marquis, Independence Ballroom F-H (Level M4)

134 TL

Orchestrating Productive Mathematics Discussions: Overcoming the Challenges

General Interest Session

There are many challenges teacher face when facilitating mathematics discussions (e.g., determining which ideas to highlight and which students to present, holding all students accountable for the ideas discussed, ensuring that the key ideas targeted in the lesson are made public). This session will provide teachers with some strategies.

Margaret (Peg) Smith

University of Pittsburgh, Pennsylvania

Walter E. Washington Convention Center, Ballroom C

135 TLC

Representational Competence: A Renewed Focus for Empowering Students

3-5 Session

Principles to Actions highlights representations as a high-leverage teaching practice. It is only through representations that students have access to mathematical ideas. Examine what it means to develop representational competence and empower students through connections among visual, physical, contextual, verbal, and symbolic representations.

DeAnn Huinker

y@dh11235

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Wisconsin–Milwaukee

Walter E. Washington Convention Center, 145 AB

136 PROF

Social Justice Lessons and Activities for the Mathematics Classroom

General Interest Session

Get ideas to help you and colleagues think deeper about social justice. Analyze lessons that end with actions to make a difference. The lessons will include both mathematics and social justice learning goals. The result is mathematics analysis that makes sense of community and world events deemed unfair. Get tips to build capacity at your site.

Linda Fulmore

Education Consultant, Cave Creek, Arizona

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

137 CCC

Statistical Literacy: Developing a Purposeful Curriculum across the Grades

General Interest Session

New standards have led to renewed interest in the role of statistics in K–12 mathematics. Developing a coherent curriculum across the grades that provides a pathway to statistical literacy for all students presents both opportunities and challenges. This session explores these challenges and considers how they can be addressed in meaningful ways.

Roxy Peck

Cal Poly, San Luis Obispo, California

Walter E. Washington Convention Center, Ballroom B













138 TLC

Teaching Students to Identify Deceptive Use of Numbers in Political Claims

Higher Education Session

This presentation is designed to help instructors teach students how to critically examine numerical data presented by politicians. Results of a qualitative study of deceptive numerical political claims will be shared. Six categories of deception were found as well as cues for recognizing them. Classroom-tested ideas for teaching will be discussed.

Marcus Jorgensen

Utah Valley University, Orem

Walter E. Washington Convention Center, 204 C



Technology, Textbooks and Tasks: **Understanding How Textbooks** Integrate Technological Activities

8-10 Session

This presentation will highlight the ways in which secondary mathematics textbooks integrate technological activities into their curriculum. We will explore the ways in which technological tasks are embedded (or not) within the sequence of lessons and activities, and how the textbooks position these tasks to help students learn mathematical ideas.

Aaron Brakoniecki

Boston University, Massachusetts

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

140 TLC



The "Pause": Making Metacognitive Thinking Visible during Think-Time

6-8 Session

Ever wonder what students are thinking during "thinktime"? Research shows process time is critical, but often students don't use this time effectively. What is happening during the "pause"? Learn strategies to foster a deeper level of metacognitive thinking and ways to make student thinking more visible.

Shephali Chokshi

Chokshi Math Consulting, Uxbridge, Massachusetts

Victoria Miles

Middleborough High School, Buzzards Bay, Massachusetts

Walter E. Washington Convention Center, 146 C



The 24[®] Game Series—Turning 30 Years Old and Still "Creating a New Generation of Thinkers!"

3-5 Session

Attendees will participate in a number of hands-on activities designed to engage, challenge, and motivate students. Activities include games from the 24° Game series. Number, pattern-sensing, and critical-thinking skills will be the focus.

Cred Dobson

@creddobson

Benjamin Banneker/Suntex International, Glenside, Pennsylvania

Shelley Rosen

Suntex International, Easton, Pennsylvania

Shawn Collier

Bethlehem Area School District, Pennsylvania

Marriott Marquis, Liberty Ballroom N-P (Level M4)



The Socialization Power of Mathematics and the Higher Purpose of Collaboration in the Digital Age

General Interest Session

The maturation of social media and the emergent currency of trust among strangers is now reshaping the landscape of how and why we are teaching and sharing mathematics. The depth and richness of mathematical discussions are creating equally powerful human connections that are serving as new social endpoints for mathematics in the 21st century.

Sunil Singh

@Mathgarden

Scolab, Montreal, Quebec, Canada

Walter E. Washington Convention Center, Ballroom A













143 TLC

Unproductive Struggle: Finding the Tipping Point between Productive Struggle and Just Struggle

3-5 Session

You learn through struggle, but, do you ever wonder at what point students go from productive to unproductive struggle? This session will highlight findings from a 12-week study of struggle in grades 3-5 bilingual classrooms during problem-based lessons. Learn to create space for struggle and strategies to retain productivity and maximize learning.

Ines Ellis-Guardiola

PS 89, Brooklyn, New York

Sara Siddappa

PS 89, Brooklyn, New York

Walter E. Washington Convention Center, 152 A

144 MODEL

Using Social Networks to Introduce Graph Theory: Lessons from the Classroom

10-12 Session

Graph theory is an important topic in discrete mathematics and an excellent low-threshold topic for mathematical reasoning. In this presentation, we discuss the use of the rich and relatable context of social network theory, using familiar social networks, for introducing graph theory. Activities and classroom examples will be shared and discussed.

Todd Abel

University of Central Arkansas, Conway

Christina Pennington

Ashe County High School, West Jefferson, North Carolina

Walter E. Washington Convention Center, 151 A

Warm Up to Number Sense and Reasoning Skills

6-8 Session

Advance your students' number sense and reasoning skills in less than five minutes per day. Learn how to use warm-ups at the start of class to create positive math experiences and help students make sense of math. Engaging activities used as quick and easy warm ups will include SolveMe puzzles, Would You Ratherâ€!?, Estimation 180, and more!

Glen Lewis

@MrLewis Math

Unionville-Chadds Ford School District, West Chester, Pennsylvania

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

146 CCC

What Are Trapezoids? A Debate on the Inclusive vs. Exclusive Definition

8-10 Session

Traditionally, a trapezoid was defined as a quadrilateral with exactly one pair of parallel opposite sides, but the inclusive definition (at least one pair of opposite parallel sides) promises increased elegance and coherence. We will vigorously debate the pros and cons of these approaches and explore the nature of mathematical definition.

William Rose

@wrose31

Montgomery Blair High School, Silver Spring, Maryland John Chase

Montgomery County Public Schools, Rockville, Maryland

Marriott Marquis, Liberty Ballroom L (Level M4)

146.1 I ew I ccc

Japanese Approach for Establishing the Foundation of CCSS-M Mathematical Practice in K and 1

Pre-K-2 Exhibitor Workshop

In this workshop, Dr. Akihiko Takahashi will explore selected examples from Japan Math Corp's Primary Math International series to help participants gain insight into the features of Japanese curriculum that support students in establishing the foundation for becoming mathematical problem solvers.

Japan Math Corp

Chicago, Illinois

Walter E. Washington Convention Center, 159 AB













146.2 **EW** TECH

Exploring What's Typical: Understanding the World Through Data

10-12 Exhibitor Workshop

How do you know you can trust the data you see in a news article? Is 'statistically significant' practically relevant? In this session we will collect and analyze data to explore the concept of meaningful results.

Texas Instruments

Dallas, Texas

Walter E. Washington Convention Center, 156

146.3 **EW** ASSESS

The Evolution of a Solution: Leveraging the Power of Star Math to Transform Accelerated Math

Coaches/Leaders/Teacher Educators Exhibitor Workshop

Facilitating student success requires personalizing learning by enhancing instruction with appropriate practice. Learn how to effectively utilize Star Math and discover how math practice at Renaissance has evolved in to a research-based solution that enables you to plan with precision, target student needs & drive success for all math students.

Renaissance Learning

Wisconsin Rapids, Wisconsin

Walter E. Washington Convention Center, 158 AB

146.4 **EW** TECH

What's the Point of Technology, Anyway? (Shouldn't It Make Our Lives Easier?)

General Interest Exhibitor Workshop

There are many definitions of technology, but most of us have experiential definitions that involve "making life easier" as an educator or consumer. However, educational technology is often fractured, frustrating, and counterproductive. Never fear—Casio is addressing your pain points by once again changing the game. You won't want to miss this!

Casio, Inc.

Dover, New Jersey

Walter E. Washington Convention Center, 143 C

1:30 P.M.-2:45 P.M.

147 TLC

A Measurement Approach to Place Value Concepts

Pre-K-2 Workshop

Place value concepts are foundational to students' development of number sense, operations, algebraic reasoning, and beyond. This session focuses on developing an understanding of place value concepts through length and area where students use concurrent representations to investigate multi-digit numbers.

Seanyelle Yagi

University of Hawaii at Manoa, CRDG, Honolulu

Fay Zenigami

University of Hawaii at Manoa, CRDG, Honolulu

Linda Venenciano

University of Hawaii at Manoa, CRDG, Honolulu

Walter E. Washington Convention Center, 143 AB

148 ASSESS Assessments in Action

10-12 Workshop

This session will look at assessments through the lens of standards based grading. Action-oriented formative assessments will be discussed as well as how evidence of mastery is identified through various forms of assessments. Participants will work in small groups to score assessments with a rubric and create rubrics for their current courses.

Renee Hunt

Centennial High School, Champaign, Illinois

Betsy Alderman

Unit 4, Champaign, Illinois

Walter E. Washington Convention Center, 150 B













149 PROF

Collaborative Planning: A Strategy to Narrow Learning Gaps!

Pre-K-2 Workshop

Are you looking for ways to narrow learning gaps and decrease the variability of student learning experiences between mathematics classrooms? We will explore the research-informed strategy of collaborative planning. Participants will analyze videos, identify common barriers, and make plans to move toward more equitable instructional practices.

Susie Katt

@susiekatt

Lincoln Public Schools, Nebraska

Delise Andrews

Lincoln Public Schools, Nebraska

Karla Bandemer

Lincoln Public Schools, Nebraska

Walter E. Washington Convention Center, 207 B

149.1 TLC

Deepen the Fun! Engage Students in **Number Games as They Communicate** to Understand Number Concepts

Pre-K-2 Workshop

Number sense is at the core of primary mathematics. Join us to play highly engaging, innovative, and classroom-tested games. Reflect on strategies you can use to help your students be flexible when adding and subtracting. Participate in oral and written discourse to deepen students' understanding of place value and relationships between numbers.

Tutita Casa

University of Connecticut, Storrs Mansfield

Linda Sheffield

Sheffield Consulting, Fort Thomas, Kentucky

Marriott Marquis, Liberty Ballroom I-K (Level M4)

150



Engaging Students in Meaningful Mathematical Sense Making through Purposeful Technology Use

8-10 Workshop

Explore relevant, classroom-ready tasks that highlight ways to engage students in mathematical sense making through purposeful uses of dynamic technology. In this session, together we will leverage technology to emphasize the coherence of mathematics while focusing efforts on analyzing student conjectures and exploring "What if . . . ?" scenarios.

Farshid Safi

University of Central Florida, Orlando

Janet Andreasen

University of Central Florida, Orlando

Marriott Marquis, Independence Ballroom E (Level M4)

151



Equitable Access to the SMPs through **Purposeful Number Talk Progressions**

6-8 Workshop

Students develop deeper understandings of number and have greater computational fluency when they build from concrete strategies to representational and abstract thinking. We will explore progressions of number talks centered around quantitative reasoning to advance the Standards for Mathematical Practice (SMPs) in our students.

Anne Agostinelli

@anneagost

University of Illinois at Chicago

Jennifer Leimberer

University of Illinois at Chicago

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)













152 ASSESS

Five Ways to Integrate Assessment into **Instructional Practice**

6-8 Workshop

This session will share how Illustrative Mathematics has integrated assessments into our grade 6-8 grade curriculum, which came out for first use in the 2017-2018 school year. Participants will engage with a variety of assessment types from the curriculum and consider how they can inform and support instructional decisions.

Ashli Black

y@mythagon

Illustrative Mathematics, Mount Desert, Maine

Rowen Kerins

Illustrative Mathematics, Waltham, Massachusetts

Walter E. Washington Convention Center, 207 A

153 TECH

From Data to Functions

10-12 Workshop

Students often wonder why they need to study functions that are commonly presented in mathematics class. Using technology, it is possible to present data from common situations that lead to the various functions that are we teach.

Fred Ferneyhough

Oame, Plympton-Wyoming, Ontario, Canada

Walter E. Washington Convention Center, 209 ABC

154 TLC

Games + Tasks = Learning +Assessment: A Balanced Approach to Math

Pre-K-2 Workshop

Student engagement is an important component of mathematical learning. High-quality games and engaging tasks are a powerful way to inspire mathematical thinking and discourse. Participants will engage in hands-on activities and rich tasks that ignite student learning and support alternative forms of assessment. Fluency is much more than facts!

Diana Zaragoza

California Math Project at UC Davis

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

I See You Care: Re-Engaging Reluctant Learners

8-10 Workshop

For too many students, the cost of learning mathematics is too high for them. Unlike failed learners, who at least try, intentional non-learners believe that if they don't try, they can't fail. In this interactive session, participants will learn to use strategies of an equity pedagogy framework to re-engage reluctant learners.

Southwest DeKalb School

@pamseda1

Seda Educational Consulting, LLC, Ellenwood, Georgia

Kyndall Brown

University of California, Los Angeles

Walter E. Washington Convention Center, 149 AB

156 CCC Investigating the Arc of Arithmetic to Algebra

3-5 Workshop

Join this tool-filled, interactive session to experience how "decomposition" and the "area model" are common K-12 threads that connect number sense to middle school math and algebra 1. Participants will see how these visual and mental models flow from subitizing to single digit and multi-digit computation to fraction and polynomial computation.

Toni Osterbuhr

@ToniOBeads

Pre-K-5 Curriculum Specialist, McGraw-Hill Education, Wichita,

Elizabeth Peyser

Curriculum Associates, Wichita, Kansas

Walter E. Washington Convention Center, 147 A

157 CCC Is Coherence Fuzzy?

Coaches/Leaders/Teacher Educators Workshop

Coherent, cohesive, connected, sequenced, interleaved—each of these words is used to describe characteristics of a high-quality math curriculum. Are they all referring to the same basic idea? What clues are provided in the CCSSM, the Publisher's Criteria, and the Progressions? Why did the CCSSM stop short of explicitly defining coherence?

Jill Diniz

Great Minds, Vero Beach, Florida

Marriott Marquis, Capitol/Congress (Level M4)













158 MODEL

Leveraging Technology into Modeling Tasks to Enhance Learning

8-10 Workshop

We'll explore modeling with great tasks. A great task engages students with an interesting modeling problem involving essential content. It seeks to build deep understanding of concepts, support rich discourse, and provide the opportunity for students to persevere. Technology alone does not solve the task—nor does technology replace thinking.

Connie Schrock

y @cfryschrock

NCSM President, Emporia, Kansas

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

MODEL 159

Mathematics at the Movies: Exploring Linear, Quadratic, and Exponential **Functions**

8-10 Workshop

Are you looking for some activities to help your algebra students understand functions? Come to this workshop and engage in some movie-related experiments. You will collect data, convert data into multiple representations, and analyze the results. Questions that promote student discourse will be considered. Popcorn will be provided (for analysis).

Amy Herman

Math Solutions, Louisville, Kentucky

Connie Horgan

Math Solutions, Jerome, Idaho

Walter E. Washington Convention Center, 152 B

Modeling a Maker-Space Mindset

8–10 Workshop

Develop rich tasks without sacrificing content by using design thinking, maker-space mentalities, and technology as ways to spark interest, dig deeper, and play with critical concepts. Hands-on activities engage students with sticky notes and play dough as well as coding and data collection. Take away resources that you can use now.

Barbara Filler

The Steward School, Richmond, Virginia

Karen Hudson

The Steward School, Richmond, Virginia

Walter E. Washington Convention Center, 103 A

161 MODEL

NASA's International Space Station Microgravity Experiments: Calculating **Mass and Weight**

6-8 Workshop

Come explore the differences of calculating mass and weight. Engage in "out of this world" hands-on, standards-aligned STEM experiments. Analyze your data by creating tables, charts, and graphs, and compare your results to video clips of similar experiments performed onboard the International Space Station in microgravity by NASA astronauts.

Sue Nichols

Ohio University, Chillicothe

Barbara Buckner

NASA Armstrong Flight Research Center, Palmdale, California

Walter E. Washington Convention Center, 144 ABC

New Teacher Strand: I Wish That I Knew What I Know Now, When I Was Younger

6-12 Workshop

"How do I engage students? How do I build relationships with them? How do I get students to talk with each other about mathematics?" Teachers, new and veteran alike, often ask these questions.

Participants in this workshop will discuss these topics, share ideas, and come away with activities that lead to classroom discourse and community-building.

Paul Kelley

Anoka High School, Minnesota

Walter E. Washington Convention Center, 204 AB













163 **NEW T**

New Teacher Strand: The How and Why of Using Visual Models for All Learners

Pre-K-5 Workshop

Why are visual models essential for all learners and not just those who struggle? Join us as we explore how the brain learns and the role of visual models in maximizing learning for all K-5 students. Through hands-on activities, classroom video and artifacts, participants will discuss and reflect on high impact practices using visual models.

Kathy Ernst

Mathematics Consultant and Coach, West Brattleboro, Vermont **Britney Koetsier**

Windsor Central Supervisory Union, Barnard, Vermont

Walter E. Washington Convention Center, 101



Number Sense Matters: Daily Activities to Enhance Children's Number Sense

Pre-K-2 Workshop

Number sense develops over time. Fostering number sense in the early years provides a strong foundation for learning early elementary school mathematics. Therefore, the content of this interactive presentation is applicable to all early childhood educators, preschool through age eight. We will provide lesson ideas and activities for ages two through eight.

St. George's Independent School, Germantown, Tennessee **Betsy Whipple**

Denver Public Schools, Colorado

Marriott Marguis, Independence Ballroom A-C (Level M4)



Reframing the Conversation: Talk Moves That Support Mathematical Discourse

10-12 Workshop

Sentence frames are a powerful way to support students in communicating their mathematical ideas. Learn to use them for many purposes including to build perseverance, reinforce vocabulary, improve partner talk, extend class discussions, and make connections. This is a teaching strategy that will take your task-based instruction to the next level!

Barbara Kuehl

Mathematics Vision Project, Salt Lake City, Utah

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

166 MODEL

Soap Bubbles: Mathematical Modeling Spanning from Geometry to Calculus

10-12 Workshop

Math modeling can help to foster curiosity and strengthen connections across topics. You will engage in the modeling process as you solve a problem whose optimal solution is inspired by nature and find that the solution lies in the structure of soap bubbles. We'll focus on the teacher role in supporting students in building proficiency in modeling.

Maria Hernandez

@mathmodeling

North Carolina School of Science and Mathematics, Durham **Taylor Gibson**

North Carolina School of Science and Mathematics, Durham

Walter E. Washington Convention Center, 202 B

167 A&E

Supporting Child-Invented Algorithms for Addition and Subtraction for More Equitable K-5 Classrooms

Pre-K-2 Workshop

This session focuses on supporting teachers' knowledge of algorithms for multi-digit addition and subtraction, especially those that are typically invented by children. Participants will engage in solving problems, representing thinking, and discussing how to support all children in developing strategies that make sense.

Courtney Koestler

OHIO Center for Equity in Mathematics and Science, Athens

Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)













168 TLC

Tricks Are NOT for Kids! Shifting from "Answer Getting" to Thinking and Understanding

3-5 Workshop

Ready to ditch the tricks but need to know the fixes? This session will explore common tricks and how to replace them with sound instruction. Learn how to make concepts stick through sense making and connections! Say buh-bye to rounding riddles, key words, and butterflies, and hello to a world where decimal points don't move (because they don't).

Alison Mello

@alisonmellomath
Foxborough Public Schools, Massachusetts

Walter E. Washington Convention Center, 201

169 ISSUES

What Are They Thinking? Sharpen Your Analysis of Student Thinking with Rich Tasks and Video

8-10 Workshop

Using rich tasks helps showcase the mathematical practices alongside important mathematical content, but the variety of student responses can be challenging. "What are students thinking? What questions should I ask? Should we talk about this as a class?" We'll use video to infer student thinking and create strategies for pushing the class forward.

Carl Oliver

y@carloliwitter

City As School, Brooklyn, New York

Liz Clark-Garvey

Math for America, New York, New York

Walter E. Washington Convention Center, 206

170 ISSUES

Why Boats Float: It Speaks Volumes about Mathematics

3-5 Workshop

In today's classrooms, elementary teachers are expected to cover a wide range of topics. In this session, participants will engage in activities that will help students understand volume of rectangular prisms as they learn about boats in an integrated mathematics, science, and engineering unit.

Christa Jackson

Iowa State University, Ames

Mollie Appelgate

Iowa State University, Ames

Christopher Whitmer

Parametric Studio, Ames, Iowa

Walter E. Washington Convention Center, 151 B

3:00 P.M.-4:00 P.M.

171 CCC

"Math Is EVERYWHERE!" Supporting the Wisdom of Pre-K Students and Their Mathematical Thinking

Pre-K-2 Session

In this interactive pre-K focused session, we examine the components of a sequence of experiences designed to build a firm mathematical foundation. Included is a discussion of the importance of a qualitative focus to develop mathematical thinking and needed language before moving to a quantitative focus. Specific examples will be shared.

Sandy Atkins

y @creatingahas

Creating AHAs, Saint Petersburg, Florida

Walter E. Washington Convention Center, 146 B













172 ISSUES

360 Degree Math: a Math Classroom Revolution

General Interest Session

Put your students thinking and learning center stage with 360 degree math. Get your students up, performing, solving, and persevering by livening up the environment with whiteboard surfaces, music cues, and visible random groupings. Untether yourself from the Doc Cam using Air Server and an iPad.

Ed Campos

y@edcamposjr

Orosi High School, Visalia, California

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)

173 CCC

A Meaningful Approach to the Quadratic Formula

10-12 Session

We will discuss deriving the quadratic formula so that students see meaning in the formula, and how that meaning applies to the roots, regardless of their nature. We will also share a vision of the graph in the Cartesian plane of a quadratic function with complex roots and the graph of its roots in a complex plane melded into a single graph.

Kenneth Chelst

Wayne State University, Detroit, Michigan

Thomas Edwards

Wayne State University, Detroit, Michigan

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

Check out the

Reflection Coves on
the second and third
floors of the Convention
Center to continue the
conversation and discuss topics of
interest with featured speakers after
their presentations!

174 A&E

Developing Justification in ALL Students through the Decide and Defend Instructional Routine

General Interest Session

Creating and critiquing mathematical arguments is essential and often difficult for students; it takes repeated and explicit practice. Participants will learn an instructional routine that builds students' capacity to interpret and make decisions about mathematics and to draft and defend their thinking, and we will show how teachers have used the routine.

Amy Lucenta

@amylucenta

Fostering Math Practices, Natick, Massachusetts

Grace Kelemanik

Fostering Math Practices, Natick, Massachusetts

Maeghan Provencher

Wellesley College, Massachusetts

Walter E. Washington Convention Center, Ballroom A

175 TLC

Developing Reflective and Persistent Problem Solvers

3-5 Session

Learning to be an effective problem solver requires critical thinking and persistence. By engaging in non-routine tasks and using journals where students had ample time to learn and develop mathematical behaviors, they became reflective problem solvers. Come to learn how to create these authentic and easy-to-implement problem-solving experiences

Minette Finney-Lewis

American United School of Kuwait, Kuwait City

Kenneth Johnson

American United School of Kuwait, Kuwait City

Cory Bennett

Idaho State University, Pocatello

Walter E. Washington Convention Center, 150 A













176 A&E

Encouraging Girls to Study Mathematics (STEM)

3-5 Session

According to a Microsoft study, girls show an interest in STEM at the age of 11, yet lose interest by age 15. How can educators encourage girls to sustain an interest in STEM? Learn how mathematics competitions and hands-on activities can keep girls excited about STEM.

Kenya Wallach

y@educationchat4u

First in Math, Philadelphia, Pennsylvania

Walter E. Washington Convention Center, Salon I

177 MODEL

Gambling, Risk, Alcohol, Poisons, and Manure: An Unfinished Life Story

General Interest Session

There is a mathematical celebrity whose scandalous biography could be the subject of a featured headline on the front page of the *National Enquirer*! The shocking, compelling, and intriguing life of this omnipresent character will be revealed at this session.

James Rubillo

Former Executive Director, NCTM; Dresher, Pennsylvania

Walter E. Washington Convention Center, 145 AB

178 MODEL

Harnessing the Power of Modeling Tasks through the Lens of a Math Progression

3-5 Session

Why do we choose one task over another? There are many factors that teachers must take into account before, during, and after a task is taught, but what drives our decision making when selecting a task? The purposeful use and sequence of a modeling task can unlock what students know and inform our next move in the progression of learning.

Graham Fletcher

y@gfletchy

Griffin-Spalding Schools, Griffin, Georgia

Marriott Marquis, Liberty Ballroom N-P (Level M4)

179 A

Multi-Tiered Systems of Support: Developing Interventions That Engage

3-5 Session

When focusing on Multi-Tiered Systems of Support, a goal is to develop highly engaging Tier 1 instruction and Tier 2 Interventions for students who struggle—particularly students with disabilities. This session considers interventions and assessments for learning number, operations, and algebraic thinking in grades 1–5.

Karen Karp

Johns Hopkins University, Baltimore, Maryland

Walter E. Washington Convention Center, 152 A

180 ISSUES

NCTM's Voice in the Evolution of Assessment, Equity, and Feminism from 1920's to the Present

General Interest Session

The presentation will critically analyze 90 years of NCTM Yearbooks (now succeeded by the APME series) to trace themes that have influenced mathematics education and had an impact on the evolution of assessment, equity, and feminism. We draw parallel between educational policy, historical events, and NCTM's yearbooks in terms of the developments of these themes.

Robert Wagner

University of Florida, Gainesville

Orhan Kaplan

University of Florida, Gainesville

Kirsten Elliott

University of Florida, Gainesville

Marriott Marquis, Liberty Ballroom L (Level M4)













181 TLC

Number Talk: A Classroom Routine to Elicit Student Thinking and Build Procedural Fluency

Pre-K-2 Session

We'll share what a number talk is and how number talks can be implemented in K–5 classrooms to elicit students' thinking, promote communicating and critiquing mathematical reasoning, build procedural fluency, and make connections among different representations so students can notice underlying mathematical structure. Student work will be shared.

Esther Billings

Grand Valley State University, Allendale, Michigan

Kathryn Coffey

Grand Valley State University, Allendale, Michigan

Marriott Marquis, Independence Ballroom D (Level M4)

182 A&E

Number Talks: A Routine Empowering ALL Students

6-8 Session

Students lacking number sense? Learn how number talks develop fact fluency and number sense at the middle school level. Spark the confidence and ability to access grade level math at the full depth of the current standards.

Ann Kim

★@annkim1013

California School of the Arts, Duarte

Jane Noh

California School of the Arts, Duarte

Vanessa Cerrahoglu

Orange County Department of Education, Costa Mesa, California

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

83 TLC

Partitioning Shapes: A Gateway to Understanding Fractions

3-5 Session

This session will emphasize the importance of students' conceptual understanding of partitioning shapes into equal-size parts and the connection to unit fractions as a foundation for fraction sense. Participants will see how concept maps, formative assessment, and hands-on activities can create meaningful classroom experiences.

Nicki Lindner

y@AuntieNick

University of Kansas, Lawrence

Lindsey Weiland

University of Kansas, Lawrence

Angela Broaddus

Benedictine College, Atchison, Kansas

Walter E. Washington Convention Center, 146 A

184 TLC Putting the "Action" in *Principles to*Actions

6-8 Session

Implementing tasks that promote reasoning and problem solving is one of NCTM's Mathematics Teaching Practices in *Principles to Actions*. Learn to ignite discourse, amplify mathematical reasoning, and excite students about exploring volume and surface area through tasks incorporating multiple entry points and numerous solution strategies.

Alissa Murray

Madison County Schools, Ridgeland, Mississippi

Christi Collins

Madison County Schools, Ridgeland, Mississippi

Marriott Marquis, Independence Ballroom F-H (Level M4)













185 A&E

Racial Profiling, Poverty, and Pollution: Actual Contexts to Teach Elementary Math? Yes!

Coaches/Leaders/Teacher Educators Session

Two professors share strategies using social justice contexts such as racial profiling, poverty, and nutrition to teach math to upper elementary students. Challenges from urban and suburban perspectives will be revealed through video, lesson plans, and discussion. Although initially hesitant, preservice teachers were successful in their efforts.

Joan Kwako

University of Minnesota, Duluth

Walter E. Washington Convention Center, 203 AB

186 A&E

REAL Math: Reaching All Learners through Mathematics Consultations

General Interest Session

We will present a framework designed to aid mathematics teachers to work with special education experts to better meet the needs of students with special education needs. This framework will help educators to think deeply about aspects critical to providing students with beneficial mathematical learning opportunities.

Samuel Eskelson

University of Northern Iowa, Cedar Falls

Sarah Van Ingen

University of South Florida, Tampa

David Allsopp

University of South Florida, Tampa

Walter E. Washington Convention Center, Salon G

187 A&E

Rethinking Misconceptions: Giving Meaningful Feedback to Support Student Participation and Identity

8-10 Session

Students have valuable mathematical ideas that show up in the strategies they use to solve problems. In this session, we will unpack the term misconception and explore ways teachers might build on the valuable mathematics in students' ideas. We will consider implications for how teachers might provide meaningful feedback and future instruction.

Starlie Chinen

@starliechinenUniversity of Washington, SeattleHannah Nieman

University of Washington, Seattle

Walter E. Washington Convention Center, 151 A

188 PROF

Side by Side: What, How, & Why Coaches and Teachers Can Learn Together in the Moment of Instruction

Coaches/Leaders/Teacher Educators Session

Coaching is often relegated to before or after teaching, but our greatest professional learning opportunities occur with children as we teach. In this session, we draw on data from a research study to examine how coaches and teachers can work together, side-by-side, during teaching to grow instruction—and support student learning—in the moment.

Jen Munson

Stanford University, California

Mary Trinkle

Ravenswood City School District, San Francisco, California Ruby Dellamano

Ravenswood City School District, San Francisco, California

Walter E. Washington Convention Center, 102 AB













3:00 P.M.-4:00 P.M.

189 TECH

Statistics and Simulation in Scratch

10-12 Session

Engage your middle and high school students in data and statistics through computing! See how statistical concepts can be easily implemented, explored, and applied in Scratch, the free coding environment from MIT. Give students another entry point to mathematics and get them integrating math and computing in class! No prior programming knowledge necessary.

Patrick Honner

₩@MrHonner

NYC Department of Education, Brooklyn, New York

Walter E. Washington Convention Center, 140 AB

190 CCC Story Archety

Story Archetypes in Mathematics Curricula

General Interest Session

One powerful way to help students navigate at the edge of order and chaos is by submersing them into archetypal stories. Like literature, math curricula have archetypes as old as Euclid. In this talk, we reveal how archetypes in literature also appear in math curricula and show how they bring coherence to both school and university learning.

Scott Baldridge

y@ScottBaldridge

Lousiana State University, Baton Rouge

Walter E. Washington Convention Center, Ballroom C

191 PROF

Student Interviews for Preservice Teachers

Higher Education Session

Student interviews are a powerful tool for unlocking mathematical understandings and misconceptions. For preservice teachers, an interview allows them to see the creative ways (or not) elementary students solve mathematical problems as related to current and future classroom discussions.

Heather Nunnally

Virginia Commonwealth University, Richmond

Kristina Anthony

Virginia Commonwealth University, Richmond

Walter E. Washington Convention Center, 204 C

192 CCC

Students Making Mathematical Connections by Solving the Same Problem Again and Again and . . .

10-12 Session

Students can make mathematical connections across topics and grade levels by solving a problem from a previous course using new content they have recently learned. They can also modify how they set up a problem and compare the solutions for both starting points. Using the same problem again can provide students with a unified view of mathematics.

Ron Lancaster

University of Toronto, Hamilton

Walter E. Washington Convention Center, Salon C

193 TLC

The Math/English Connection: Teaching Technical Writing & Note-Taking Skills to High School Students

10-12 Session

A father/daughter, math teacher/English teacher team will present seven different levels of note taking. Examples of actual student work will be displayed and critiqued. Specific strategies that help students practice technical writing using their daily math class notes will be scrutinized. The focus is on content-centered writing.

Julianne Gerver

Three Village School District, Stony Brook, New York

Robert Gerver

Retired, North Shore Schools, Kings Park, New York

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)













3:00 P.M.-4:00 P.M.

194 CHANGE

Rethinking What Each and Every High School Student Needs Related to Algebra and Functions

General Interest Session

What are the essential concepts in algebra and functions that are critical for all students to learn that support a variety of rigorous high school mathematical course pathways? Come for an interactive, fresh look into how *Catalyzing Change* approaches the distinct and combined roles of algebra and functions in high school mathematics.

Max Ray-Riek

@maxrayriek

Illustrative Mathematics, Philadelphia, Pennsylvania

Kanita DuCloux

University of Western Kentucky, Bowling Green

Walter E. Washington Convention Center, Salon G

195 TECH

Top Ten Teaching "Aha" Moments in Calculus: Visual Insights Gained through Technology

10-12 Session

Numerical, graphical, and symbolic capabilities made accessible by graphing calculators and computer algebra systems bring the Rule of Three alive in calculus, affording truly new opportunities for insights. We will share our top ten teaching "aha" moments that have made a real difference to our students' appreciation of the beauty of calculus.

Thomas Dick

Oregon State University, Corvallis

Gail Burrill

Michigan State University, East Lansing

Marriott Marquis, Liberty Ballroom M (Level M4)

96 TECH

Using Coding to Explore in Algebra and Geometry

8-10 Session

Coding is a skill that is in high demand. But did you know it can also improve computational thinking, especially when applied to math problems? See how to promote critical thinking and boost engagement by using programming in your algebra and geometry classes. No prior programming experience is required.

Curtis Brown

Texas Instruments Inc., Sachse, Texas

Walter E. Washington Convention Center, 202 A

197 TLC

Using Noticing and Wondering to Leverage Mathematical Argument at the K-2 Level

Pre-K-2 Session

In this presentation, attendees will learn strategies for encouraging K–2 students to notice and wonder about mathematical concepts and how to use those discussions to promote mathematical argument and discourse. Tasks promoting noticing, wondering, and argumentation at the K–2 level will be shared along with the strategies.

Chepina Rumsey

University of Northern Iowa, Cedar Falls

Jody Guarino

Orange County Department of Education, Costa Mesa, California

Walter E. Washington Convention Center, 146 C

198



Watch Students Become Multiplication Masters, Fraction Fanatics & Vocabulary Victors!

3-5 Session

Tune in to research masters Jensen, Marzano, Burns, and Van de Walle, as they validate current math standards providing greater focus on fewer topics. Learn games and hands-on activities to master multiplication and fraction concepts while building fluency, vocabulary, and problem-solving skills. Meet the needs of every child, every chance, every day!

Sandra White

Independent Educational Consultant, Shallowater, Texas

Walter E. Washington Convention Center, 147 B















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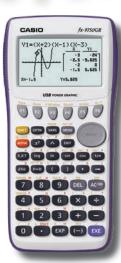
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3:00 P.M.-4:00 P.M.

199 TLC Why Ask Why: The Art of Questioning

6-8 Session

Dylan William (*Embedded Formative Assessment*, 2011) portends that "there are only two good reasons to ask questions in class: to cause thinking and to provide information to the teacher about what to do next." In this session, teachers will develop quality questions based on either a mathematical concept or specific task using strategies.

Shannon Motsco

Anne Arundel County Public Schools, Glen Burnie, Maryland Mary Rathlev

Anne Arundel County Public Schools, Glen Burnie, Maryland

Walter E. Washington Convention Center, 154 AB

200

More Than Patterns: Cultivating Coherent Understandings of Standards for Mathematical Practice 7 & 8

Research Session

Are you confused about SMP 7 and 8? You're not alone! Teachers across the nation are unsure about what structure, regularity, and repeated reasoning actually mean and why these standards are important. In this session, we will share findings and analysis of our study to clarify the two practices and offer implications for teaching.

Nicole Hansen

y @nleehansen

Boston Public Schools, Roxbury, Massachusetts

Hilary Kreisberg

Lesley University, Cambridge, Massachusetts

Walter E. Washington Convention Center, 103 B

200.1 EW ISSUES

Do Your Students Read and Reflect in Math Lessons?

3-5 Exhibitor Workshop

Why are reading and reflecting essential in math classes? Participants will learn the importance of developing literacy in mathematics and how to boost students' learning by encouraging students to reflect on their strategies.

Shing Lee Publishers

Singapore

Walter E. Washington Convention Center, 143 C

200,2 **ew** Tech

HP Prime: Mathematics Education Technology on All Platforms!

10-12 Exhibitor Workshop

Get acquainted with HP Prime: the app-based, full-color graphing calculator. HP Prime is also available as software on Mac and PC as well as Android/iOS/Win10 phones/tablets. All versions have multi-touch, gesture-driven user interfaces (for example, pinch to zoom on a graph) and more. You'll receive a free copy of the software after the workshop.

HP, Inc.

San Diego, California

Walter E. Washington Convention Center, 158 AB

200.3 (W) MODEL Making Math Relevant Through Modeling

10-12 Exhibitor Workshop

Modeling mathematics through applied problems that students can see and touch can develop their understanding of the concepts they are learning. In this session, we'll do hands-on experiments that connect math concepts to real-world observations.

Texas Instruments

Dallas, Texas

Walter E. Washington Convention Center, 156

200.4 **CW MODEL**Modeling the Future Challenge

10–12 Exhibitor Workshop

Josh Neubert, CEO at the Institute of Competition Sciences and co-developer of the Modeling the Future Challenge, will show how your students can compete for \$55,000 in scholarships by modeling how new technologies may change the future. Attend and be entered in a drawing for a \$500 grant to start a Modeling Team at your school.

The Actuarial Foundation

Schaumberg, Illinois

Walter E. Washington Convention Center, 159 AB













201 A&E

"My Students Don't Know How to Talk about Math": Discourse Structures That **Promote Student Engagement**

3-5 Workshop

We will engage participants in mathematical activities that promote productive discourse around reasoning and sense making. We'll discuss discourse norms and structures that provide students support for communicating their mathematical thinking in small and whole group settings, as we reflect on power and participation in the classroom.

Carolee Koehn Hurtado

™@caroleehurtado

University of California, Los Angeles

Cathery Yeh

Chapman University, Orange, California

Mark Ellis

California State University, Fullerton

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

202 TLC



Building a What??? From a Blank Strip of Paper to a Meter Stick: Decimal Place Value in Context

3-5 Workshop

How can building a meter stick and estimating and then measuring the length of objects be used to develop place-value understanding with decimals? Join us for a hands-on, classroom ready activity called Meter Stick Decimals. The presentation will also include engaging games to support all types of learners with decimal concepts.

Janna Canzone

@irvinemathproj

University of California, Irvine

Karajean Hyde

University of California, Irvine

Jeff Hruby

University of California, Oceanside

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

Capitalizing on Culture

3-5 Workshop

Rather than viewing students by their deficits, use their cultural backgrounds and heritage to build upon the strong mathematical backgrounds they have already built. This session will have participants consider their own mathography and culture as well as connect to the backgrounds and cultures of the families and students they serve.

Amber Trantham

@atranth

Jacksonville State University, Anniston, Alabama

Nicolette Nalu

University of Alabama, Tuscaloosa

Walter E. Washington Convention Center, 209 ABC



Constructing and Using Content Progressions for Teaching and Learning Math

Coaches/Leaders/Teacher Educators Workshop

Planning for instruction, even when thoughtful and well-intentioned, too often yields haphazard results due to a lack of structure. This workshop shares our framework for partnering with teachers to develop unit learning progressions that have both deepened teachers' content knowledge and improved the conditions for authentic student learning.

Nicole Caulfield

@NCaulfield1

MSD of Wayne Township, Indiana

John Ulbright

MSD of Wayne Township, Indiana

Walter E. Washington Convention Center, Salon H













205 TLC

Cooperative Activities in AP Calculus Designed to Link Content to the Mathematical Practices

10-12 Workshop

Mathematical Practices for AP Calculus provides a framework for integrating content with pedagogy. We will engage in three activities designed to get students communicating and connecting representations: graphing f from f', building new series from old, and an integration jigsaw. Techniques used were inspired by AVID Culturally Relevant Teaching.

Karen Hyers

y@keyhyers

Tartan High School, North St. Paul, Minnesota

Marriott Marquis, Capitol/Congress (Level M4)

206 TLC

Create Innovative Lesson Plans Based on Classics of Children's Literature

Pre-K-2 Workshop

The session leader will outline the stories of three classic children's books and present a complete lesson plan based on the story or characters; the plans will vary in math concept and grade level and copies of each plan will be available. Participants will then select different books from those provided and form groups to create and share lesson plans.

Marianne Prokop

Author, MW Penn, Gainesville, Florida

Walter E. Washington Convention Center, 207 A

207 TLC

Developing Understanding of Integer Operations through Context

6-8 Workshop

Do you find it difficult to teach students integer operations without jumping right into rules and procedures? What if you had a way to build students' conceptual understanding instead? We will present a series of classroom-tested lessons designed to help develop students' reasoning and sense making through a context accessible to all learners.

Anne Schmidt

Lincoln Public Schools, Nebraska

Julie Kreizel

Lincoln Public Schools, Nebraska

Delise Andrews

Lincoln Public Schools, Nebraska

Marriott Marguis, Independence Ballroom A-C (Level M4)

208 A&E
Eye on the Prize

Pre-K-2 Workshop

Experience the delight of math through a child's eyes using activities to develop conceptual and perceptual subitizing skills. Activities focus on counting skills, operations and algebraic thinking, cardinality, and numbers and operations in base ten. Prize will be your students' understanding! Activities and website materials will be available.

Becky Walker

₩@WalkBec

CESA 7, Green Bay, Wisconsin

Denise McDowell

Big Ideas Learning, Erie, Pennsylvania

Walter E. Washington Convention Center, 144 ABC

Don't miss **ShadowCon** at 6:00 p.m. on Thursday, April 26, in Ballroom B (Walter E. Washington Convention Center). Because of its growing popularity and overwhelming demand, over the last three years we've made it part of the NCTM Annual Meeting experience.















209 TLC

Fluency without Tears: Building Procedural Fluency from Conceptual Understanding

Pre-K-2 Workshop

To support the mathematics learning of all students, effective teachers use a foundation of conceptual understanding to build procedural fluency. Attend this workshop to learn strategies for using a variety of games and activities to help students develop conceptual understanding and build procedural fluency.

Latrenda Knighten

@LatrendaK

East Baton Rouge Parish School System, Louisiana

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

210 CCC

Get Strategic: A Thoughtful Progression of Addition and Subtraction Strategies

Pre-K-2 Workshop

Understanding computational strategies is essential for students' mathematical development in becoming flexible and efficient thinkers. In this session, participants will learn how the the meaningful progression of strategies allows students to develop new approaches to computation as well as build a deeper understanding of number.

Susan Jensen

Howard County Public Schools, Columbia, Maryland

Megan Friedman

Howard County Public Schools, Columbia, Maryland

Marriott Marquis, Independence Ballroom E (Level M4)

211 TLC

Insight through Misconceptions: Helping Students Develop Strong Geometric Understanding

3-5 Workshop

Students develop many misconceptions about geometric figures throughout elementary school, and these misconceptions can cause confusion as the work grows more complex. Walk away with classroomtested resources and strategies to combat, and even use, misconceptions to help students develop a firm understanding of geometric concepts in grades 3–5.

Dennis McDonald

Howard County Public Schools, New Windsor, Maryland

Walter E. Washington Convention Center, 152 B

212 PROF

Leading High-Quality Math Lesson Study: What, Why, and How

Coaches/Leaders/Teacher Educators Workshop

Done well, lesson study is the most effective professional learning structure to authentically transform math instructional practice. In this session, participants will learn what lesson study is as well as how to design and structure this recursive system of action research within varying school contexts, budgets, and schedules.

Andrea Barraugh

Math Transformations, San Diego, California

Walter E. Washington Convention Center, 204 AB

213 TLC

Models for Teaching Fractions: The Case for Using Multiple Representations

3-5 Workshop

Using and connecting mathematical representations is one of the eight Mathematics Teaching Practices in NCTM's *Principles to Actions*. In this session, participants will explore different models for fractions (circles, paper folding, chips, and the number line). Sample lessons, student work, and interview data will document how the different models support students' fraction learning.

Debra Monson

University of St. Thomas, Minneapolis, Minnesota

Kathleen Cramer

University of Minnesota, St. Paul

Sue Ahrendt

University of Wisconsin-River Falls

Walter E. Washington Convention Center, 206













214 TLC

Motivating Investigations of Probability with Russian Egg Roulette

8-10 Workshop

Russian egg roulette is a probabilistic game that is a regular feature of the *Tonight Show*. The game is a compelling probability scenario that can be used to motivate the study of probability in the middle grades and high school. Come and observe Russian egg roulette, pose interesting questions, and investigate experimentally and theoretically.

Matt Roscoe

University of Montana, Missoula

Frederick Peck

University of Montana, Missoula

Walter E. Washington Convention Center, 150 B

215 NEW T

It's Not ALL New: Building Your Professional Resource Library

8-12 Workshop

Are there classic books and classic authors' works early-career mathematics teachers should have on their physical or digital bookshelves? Sure! But where to start? Benefit from NCTM's *Mathematics Teacher* editor's 50+ years of reading and experience, and leave with an annotated list of the great mathematics books.

Al Goetz

National Council of Teachers of Mathematics, Reston, Virginia

Marriott Marquis, Capitol/Congress (Level M4)

216 TLC Number Talks in the K–2 Classroom

Pre-K-2 Workshop

Explore how to use number talks in the K–2 classroom as a way to help boost number sense, strengthen students' mental math strategies and fluency, and build discourse in the math classroom. Engage in number talks, learn about the need for number talks in primary classrooms, and leave with a plan for how to implement number talks in the classroom

Cathryn Anderson

Carnegie Learning, Philadelphia, Pennsylvania

Rachel Schwartz

Carnegie Learning, Philadelphia, Pennsylvania

Walter E. Washington Convention Center, 149 AB

217 MODEL

Observation to Equation: Learning to Think like a Mathematical Modeler

10-12 Workshop

How does a modeler leap from the real world to a mathematical model? How does one move from observation to equation? Practice mathematical modeling and learn what's needed to take that crucial step from the real world to the world of mathematics. Learn to translate from observation to equation and back again and leave thinking like a modeler.

John Pelesko

y @peleskoj

University of Delaware, Newark

Michelle Cirillo

University of Delaware, Newark

Walter E. Washington Convention Center, 151 B















Linear Functions Roadmap: Making Connections across Grades

8-10 Workshop

The key to deep understanding is connecting to prior and future knowledge. Through rich tasks, we will explore the progression of linear functions from proportional relationships in grade 6 to interpreting linear models in grade 9, to comparing with other function families in higher grades.

Kristie Donavan

∀@KristieDonavan

Irvine Unified School District, California

Martha Barrett

Irvine Unified School District, California

Walter E. Washington Convention Center, 143 AB

219 ISSUES

STEAM Ahead, But Don't Leave the Math Behind! Math-Art Activities That Engage AND Share Real Math

6-8 Workshop

How can we make math-art activities that don't treat math as an afterthought? We'll do an activity that gets students talking about math while making hallway-quality art. (And look at real student work!) We'll also discuss learning goals and think about how different math-art activities give students affirming, worthwhile mathematical experiences.

Anna Weltman

y @AnnaWeltman

University of California, Berkeley

Walter E. Washington Convention Center, 101

220



Supporting Mathematical Language Development by Design

6-8 Workshop

To support a wide range of students, curriculum materials must be mathematically coherent, and it must support mathematical reasoning, language development, and procedural fluency. The design principles and implementation of an OER middle school mathematics curriculum must have all that, as well as additional supports for English language learners.

Kristin Umland

¥@kristin umland

Illustrative Mathematics, Los Ranchos, New Mexico

Tammy Baumann

Open Up Resources, Menlo Park, California

Walter E. Washington Convention Center, 202 B

221 CCC

The Holy Grail of AP Statistics: How to Develop Conceptual Understanding of the P-Value

10-12 Workshop

AP statistics courses culminate with students learning how to perform several different significance tests. Students make their conclusion based on the p-value: "If the p-value is low, the null must go!." In this workshop, we will use simulations to move away from this memorized anthem and towards building a conceptual understanding of the p-value.

Luke Wilcox

@wilcoxl22

East Kentwood High School, Michigan

Walter E. Washington Convention Center, 103 A













222 MODEL

U.S. Mail: Merging Transformational Geometry, Algebra, and Probability through Modeling

10-12 Workshop

Transformational geometry, algebra, probability, and modeling all merge in the everyday context of canceling a stamp on an envelope. Participants will experience a multiperson model which will support an intuitive understanding of these abstract principles and have an activity ready for classroom use.

Mary Martin

Middle Tennessee State University, Murfreesboro

Tammy Jones

TLJ Consulting Group, Lebanon, Tennessee

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

223 NEW T

New Teacher Strand: Five Fantastic Fluency Routines

General Interest Workshop

Some think FLUENCY is just fact recall, but it is SO MUCH MORE. And we need fluency at all levels. Come and engage in in 5 Fantastic Fluency routines which you can use to engage your students and use productively to structure your classroom and student learning. A great way for new teachers to gets students consistently thinking about math.

Jennifer Bay-Williams

University of Louisville, Kentucky

Walter E. Washington Convention Center, 204 AB

224

TLC

What's Cotton Got to Do with It?? How Math and Cotton Intersect to Engage Students Learning Algebra

8-10 Workshop

The tires on your vehicle, explosives, Pringles, and cosmetics are all tied to "the touch, the feel, the taste, and the fabric of our lives!" Come experience the modernization of cotton farming (you will pick cotton) and the relationship of the harvest tied to scatter plots and linear regression. Learn the insights of bringing tasks to life.

Michelle Mikes

y @CobbMathDept

Cobb County School District, Marietta, Georgia

Ashley Clody

Cobb County School District, Marietta, Georgia

Marriott Marquis, Liberty Ballroom I-K (Level M4)

225 ASSESS

Writing Fair and Effective Scoring Rubrics for Free-Response Questions

10-12 Workshop

Math assessments, both inside and outside the classroom, include free-response questions. To ensure fairness and uniformity in the scoring of these questions, it is essential that test writers, including classroom teachers, follow best practices in writing scoring rubrics. Come learn how to design and create your own effective scoring rubrics.

Robin O'Callaghan

Educational Testing Service, Princeton, New Jersey

Frederick Schuppan

Educational Testing Service, Princeton, New Jersey

Walter E. Washington Convention Center, 201













226 TLC

Neighborhood Shapes: A K–2 Geometry Exploration

Pre-K-2 Session

How can you help your students construct a deep understanding of geometric concepts in ways that are meaningful and relevant? In this session, we will share a geometry unit that includes real-life investigations, games, and engaging activities to help all learners acquire and create with big ideas around shapes and patterns.

Yojairy Sands

The Cathedral School of St. John the Divine, New York, New York First Grade

The Cathedral School of St. John the Divine, New York, New York Maria Peneda

The Cathedral School of St. John the Divine, New York, New York

Walter E. Washington Convention Center, 152 A

227 TLC

#SlowMath: Looking for Structure and Noticing Regularity in Repeated Reasoning

8-10 Session

How do we provide opportunities for students to learn to use structure and repeated reasoning? What expressions, equations, and diagrams require making what isn't pictured visible? Let's engage in tasks where making use of structure and repeated reasoning can provide an advantage and think about how to provide that same opportunity for students.

Jennifer Wilson

★@jwilson828

Northwest Rankin High School, Jackson, Mississippi **Jill Gough**

Trinity School, Atlanta, Georgia

Walter E. Washington Convention Center, 145 AB

228 A

A&E

Bringing ELL Students into the Math Conversation

3-5 Session

English language learners sometimes struggle in math because the scaffolds that teachers use during reading instruction seem out of place next to math content. In this session, participants will learn strategies that build a culture of discourse in math class by scaffolding lessons using a variety of means of entry and previewing vocabulary.

Jan Scott

Houghton Mifflin Harcourt, Olathe, Kansas

Walter E. Washington Convention Center, 151 A

229 TLC

Daring Differentiation Strategies for Equitable Classrooms

6-8 Session

Explore a middle school math curriculum that is sure to challenge the way you think about scaffolding instruction. During this interactive session, participants will apply multiple content- and activity-specific differentiation techniques within lessons to better understand how to incorporate differentiation strategies into their core curriculum.

Tammy Baumann

Open Up Resources, Menlo Park, California

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

230 TLC

Developing Fraction Sense through Models and Discussion

3-5 Session

It's crucial to build a solid foundation of fractions using visual models, manipulatives, reasoning, and quality tasks. Participants will develop an understanding of fractions and examine student misconceptions. Feedback strategies to advance student learning will be discussed. Participants will make connections to the eight Mathematics Teaching Practices.

Denise Bogart

y @denisebogart

Howard County Public School System, Elkridge, Maryland **Kelly Healey**

Howard County Public School System, Ellicott City, Maryland Caitlin Reese

Howard County Public School System, Ellicott City, Maryland

Marriott Marquis, Independence Ballroom D (Level M4)













231 CCC

Digging Deep into Ratios and Proportional Relationships in the Middle Grades

6-8 Session

Ratios and proportionality have a complex history and connect with many concepts in the curriculum, not always in a consistent fashion. Facilitators and participants will explore the fundamental ideas of ratios and proportional relationships to understand their development, contexts, and roles in the middle-school curriculum.

April Strom

Scottsdale Community College, Arizona

Scott Baldridge

Louisiana State University, Baton Rouge

Kyle Pearce

Greater Essex County District School Board, Belle River, Ontario, Canada

Walter E. Washington Convention Center, 203 AB



Do You Hear What I Hear? Sounds of Student Thinking

6-8 Session

Session participants will learn how to gather and interpret evidence of student thinking at strategic points within a lesson. These key strategies will allow for real-time classroom decisions that will help students to strengthen conceptual understanding, build towards procedural fluency, and account for common misconceptions.

AnnMarie Varlotta

@amvarlotta

Howard County Public Schools, Ellicott City, Maryland

Megan Gittermann

Howard County Public Schools, Columbia, Maryland

Walter E. Washington Convention Center, 140 AB

PROF

Elevate the Expertise Within: A **District Utilizing Internal Capacity and** Collegiality to Grow

Coaches/Leaders/Teacher Educators Session

How do you transfer the knowledge and skills implemented by some math teachers in a school system to ALL? One option is to identify where teacher practice is effective, develop and support those teachers as leaders, and create the structures for them to lead professional dialogues across the system. We will share our plan, process, and tools.

Jessica Addison

@JessAddison

Christian County Public Schools, Hopkinsville, Kentucky

Walter E. Washington Convention Center, 102 AB



Equality and Equity in the Elementary School Mathematics Classroom

Pre-K-2 Session

Low SES and AIS children are often given low-level rote experiences in mathematics because they are thought to be incapable of persevering through and mastering the material. Through journals and video, we show how the thoughtful use of manipulatives and emphasis on sense making, reasoning, and problem solving can overcome gaps in understanding.

Donna Lillis

Cheektowaga Central School District, New York

Marriott Marquis, Liberty Ballroom L (Level M4)



Equivalence: The Critical Thread— All Things Being Equal

8-10 Session

We regularly want students to change forms of expressions, use different notations, "simplify," manipulate equations to solve, and so on. But we don't address the big idea of Equivalence in math as the theme or thread it should be? Changing the focus to equivalence builds connections and strengthens understanding organically across high school topics.

Mary Wiltjer

Glenbrook South High School, Chicago, Illinois

Sheila Hardin

Oak Park and River Forest High School, Illinois

Walter E. Washington Convention Center, 146 C













236 TLC

Making Sense of Fraction Division

6-8 Session

Engage in experiences designed to develop a deeper understanding of fraction division. Examine the progression of fraction operations through the elementary and middle grades. Make sense of fraction division tasks through individual and group work, classroom video, and discussion. Explore tasks and ways to differentiate for use in your classroom.

Ha Nguyen

Georgia Southern University, Statesboro

Heidi Eisenreich

Georgia Southern University, Statesboro

Walter E. Washington Convention Center, Salon C



Math Anywhere! Noticing Opportunities to Engage Young Mathematicians

Pre-K-2 Session

Educators and parents may feel confident about noticing opportunities to promote literacy throughout the day. Can we use a similar approach in the classroom and beyond to promote math reasoning? This session will explore strategies and resources to surface math ideas and fuel mathematical discussions with early learners in any setting.

Molly Daley

@mdaley15

Educational Service District 112, Vancouver, Washington Victoria Hrdina

Indiana University Northwest, Gary, Indiana

Walter E. Washington Convention Center, 146 A

ISSUES

Mathematical Creativity & **Mathematically Creative Writing to Foster Exceptional Mathematical Promise**

3-5 Session

Recently NCTM published a position statement on "Providing Opportunities for Students with Exceptional Promise." Encouraging mathematical creativity and mathematically creative writing is one opportunity for students to develop and demonstrate exceptional mathematical promise. But just how do we do this with our elementary students? Come explore!

Janine Firmender

Saint Joseph's University, Philadelphia, Pennsylvania

Madelyn Colonnese

University of North Carolina Charlotte

Tutita Casa

University of Connecticut, Storrs

Walter E. Washington Convention Center, Salon I

239 MODEL

Modeling in Math 1 with Parachuting Lego® Men

8-10 Session

You will design and construct a parachute for your Lego® man, video his descent, and plot his height as he falls. What's going to happen? Will he reach terminal velocity? Can you build a piecewise function to model his descent? What would the pieces be? Can this Lego® man intrigue you as he did my Math I students? Join the experiment and find out.

Julie Riggins

@jrigginsEFHS

East Forsyth High School, Kernersville, North Carolina

Walter E. Washington Convention Center, 150 A

Get the newest publications and products in math education. Take advantage of conference savings in the **NCTM Bookstore**.















240 TLC

Numberless Word Problems: Creating a Culture of Sense Making

3-5 Session

Sense making isn't something we can just tell students to do and assume it will happen automatically. How does sense making become part of the fabric of classroom culture? This session explores how the numberless word problem routine can be used to foster a classroom community where students are empowered to become sense makers and problem solvers.

Brian Bushart

@bstockus

Round Rock ISD, Texas

Regina Payne

Round Rock ISD, Texas

Marriott Marquis, Liberty Ballroom N-P (Level M4)

241



Pedagogy That Advances Algebraic Reasoning in Elementary Grades

3-5 Session

Young students can engage in algebraic reasoning, when provided appropriate instruction. We will present sequences of function tasks that facilitate the development of algebraic reasoning across K-grade 5. We will also present videos of classrooms in which students have mathematically rich discussions around the task.

Angela Gardiner

TERC, Cambridge, Massachusetts

Maria Blanton

TERC, Cambridge, Massachusetts

Despina Stylianou

City College of New York, New York

Marriott Marquis, Liberty Ballroom M (Level M4)

242



Planning and Preparing for Lessons: Rarely Easy, Always Important

General Interest Session

Whether or not I've taught lessons before, each time I plan and prepare, I draw on my years of teaching experiences to anticipate students' responses. I also benefit from ideas I scour from new publications, blogs, and Twitter. In this talk, I present the criteria that influence my choices and offer specifics to illustrate my process.

Marilyn Burns

@mburnsmath

Consultant, Sausalito, California

Walter E. Washington Convention Center, Ballroom A

243



Please Challenge Me! Differentiating for Strong Mathematics Students in the **Primary Grades**

Pre-K-2 Session

Learn how to challenge strong mathematics students in mixed-ability, K–2 classrooms using rich mathematics tasks, task extensions, opportunities for student choice, and tiered activities. The importance of teacher moves to promote growth mindset and cultivate a classroom culture in which all students embrace challenge will also be discussed.

Wendy Bray

Florida State University, Tallahassee

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)



Promote Statistical Understanding by Connecting Data Collection, Data Analysis, and Inference

10-12 Session

How can we help students make sense of important statistical concepts like margin of error and P-value? By showing how these ideas connect to the statistical process: ask questions, collect data, analyze data, and interpret results. In this session, we will explore two engaging contexts that promote deeper understanding of statistical inference.

Daren Starnes

The Lawrenceville School, New Jersey

Walter E. Washington Convention Center, 202 A













245 CCC

Relating Fractions, Measurement, and Data with Meaningful Number Lines

3-5 Session

Number lines are difficult conceptually for many students. Using learning progressions and conceptual connections across fractions, measurement, and data can help. We will discuss ways to help students see and feel length units and use patterns to overcome errors.

Karen Fuson

Consultant, Fallbrook, California

Walter E. Washington Convention Center, 103 B

246 CHANGE

The Wonders and Joys of Mathematics and Statistics

8-10 Session

While mathematics and statistics prepare students to be college and career-ready, other purposes for teaching high school math are equally important. *Catalyzing Change* is based on rethinking the purposes of high school mathematics and how teachers can make them part of our work.

Francis Su

@mathyawp

Harvey Mudd College, Claremont, California

Christine Franklin

American Statistical Association, Watkinsville, Georgia

Gail Burrill

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Michigan State University, East Lansing

Walter E. Washington Convention Center, Ballroom B

246.1 CCC



Come to the Dark Side: Help Your Students Experience the Power of the Integers

6-8 Session

Integers are not whole numbers! Operating with integers requires new ways of thinking about and picturing numbers themselves. See how to use models to help students appreciate the power of the additive inverse and transform the way they think about numbers.

Aran Glancy

y @aran.glancy

Purdue University, West Lafayette, Indiana

Christy Pettis

University of Minnesota, Minneapolis

Walter E. Washington Convention Center, 147 B

247



Sense Making: Is It at the Core of Your Classroom?

General Interest Session

Are your students making sense of the mathematics they explore? Do they feel that mathematics is an inherently sensible endeavor? We'll look at ways in which students don't make sense of mathematics, consider why, and discuss strategies for making it a larger part of the expectations in your classroom.

Annie Fetter

21st Century Partnership for STEM Education, Conshohocken, Pennsylvania

Walter E. Washington Convention Center, Ballroom B

248 TECH

Spark an Interest in Coding in Your Math Class

8-10 Session

Coding can reinforce math concepts and strengthen students' reasoning and problem-solving skills. In this hands-on session, learn how you can add coding to your math classroom by using your TI graphing calculator. No experience needed! We will break down a math concept and then translate it to code on your calculator.

Kim Gonzales

@kim__gonzales

Texas Instruments, Dallas, Texas

Curtis Brown

Texas Instruments, Dallas, Texas

Walter E. Washington Convention Center, 154 AB

249 TLC

Strategies and Tasks to Build Procedural Fluency from Conceptual Understanding

General Interest Session

Procedural fluency is a key aspect of math proficiency. Yet many students fail to develop fluency despite our best efforts. Connecting procedures to underlying concepts is essential for fluency. This session explores: "What is procedural fluency?" What tasks and strategies help students build fluency?" and "What common pitfalls should I avoid?"

Diane Briars

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Pittsburgh, Pennsylvania

Walter E. Washington Convention Center, Ballroom C













The Mathematical Mysteries of a U.S. \$1 Bill!

General Interest Session

Money intrigues and motivates everyone—young and old. Who could have predicted that our common US \$1 bill could have a multitude of arithmetic, geometric, and origami connections for students of all ages? Hear the amazing story behind this rectangle, what it has to do with radar and polyhedra, and when \$1 can be worth much more than a dollar!

David Masunaga

Iolani School, Honolulu, Hawaii

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

251 PROF

Through Your Students' Eyes: Making Learning Visible in the Co-Taught Math Classroom

General Interest Session

What does success look like in a co-taught math class? Have the power to see learning through the eyes of your students! When co-teachers collaborate to plan, teach, and assess, learning becomes visible. A focus on student learning makes invisible learning processes visible, and empowers the teacher/student learning team to reach desired goals.

Tamara Smith-Moyler

Training and Technical Assistance Center at Old Dominion University, Norfolk, Virginia

Laura Beller

Training and Technical Assistance Center at Old Dominion University, Norfolk, Virginia

Marriott Marquis, Independence Ballroom F-H (Level M4)

252 CCC

Transformations as a High School Curriculum Strand for Students as Mathematical Modelers

10-12 Session

Transformations appear in many places in the high school curriculum. Disconnected development of the ideas introduces misconceptions and missed opportunities. The goal for this session is to identify connections across transformations in high school mathematics while showcasing technology use and preparing students for mathematical modeling work.

Rose Mary Zbiek

y @Zbiek

The Pennsylvania State University, University Park

Walter E. Washington Convention Center, 146 B

253 PROF

Young and the Reckless: A Teacher Cohort Studies the Messiness of Inquiry-Based Math

Coaches/Leaders/Teacher Educators Session

Come learn how nine teachers collaborated and flourished as they stretched their learning and implemented inquiry based rich tasks with the help of a local college. The richness of teacher dialogue created an atmosphere of thought-provoking support. Tasks ideas, development, and planning tips will be shared, along with student work and video.

Jeanine Haistings

William Jewell College, Liberty, Missouri

Todd Hinnenkamp

NKC School District, Kansas City, Missouri

Walter E. Washington Convention Center, 204 C

253.1 **ew TECH**

Parents Count! Engage Parents to Help Kids Love Math

Pre-K-2 Exhibitor Workshop

Learn how the free Bedtime Math app builds parent engagement and helps kids love math. Parents Count participants receive free communications tools and access to real-time data on usage of the app, providing a unique window into parental engagement.

Bedtime Math Foundation

Summit, New Jersey

Walter E. Washington Convention Center, 158 AB













253.2 CW ISSUES

Drill or Practice—Helping Students Consolidate and Deepen Their Learning through Problem Solving

3-5 Exhibitor Workshop

The problem-solving approach provides opportunities to develop higher order thinking skills and metacognitive skills, thereby training students to be good problem solvers. Participants will pick up ideas on how to modify questions for students to select appropriate heuristics to solve them without having to increase teaching time.

Shing Lee Publishers Singapore

Walter E. Washington Convention Center, 143 C

253.3 **EW** TLC **Embracing** *Principles to Actions*

8–10 Exhibitor Workshop

Wondering how to incorporate *Principles to Actions* in your school? Let CPM show you! For over 25 years CPM has provided rich mathematics curricula that is student-centered and problem based encouraging thinking, persevering, and sense making. Experience the excitement students do, exploring CPM's curriculum. Receive free access to the curriculum.

CPM Educational Program

Elk Grove, California

Walter E. Washington Convention Center, 159 AB

253.4 **ew** TLC

From Visual Models to Visualization: Lessons from Singapore

Coaches/Leaders/Teacher Educators Exhibitor Workshop

Visual models are used in Singapore to help students visualize quantitative & algebraic relationships. Andy Clark and Laura Gifford will focus on the use of visual models such as number lines and bonds, ten frames, and bar models used in the successful Singapore curriculum to develop number sense and enable all students entry points to complex problems.

Houghton Mifflin Harcourt

Austin, Texas

Walter E. Washington Convention Center, 156

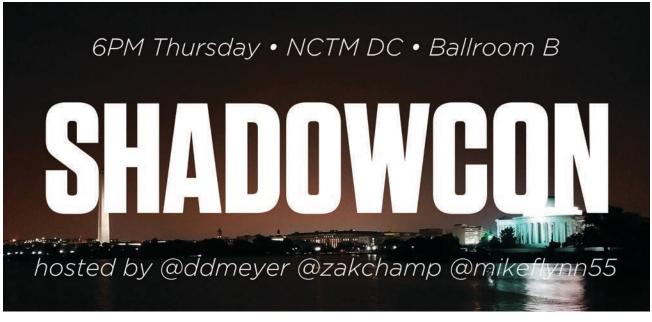
6:00 P.M.-7:00 P.M.

254 TECH ShadowCon

General Interest Session

This year's ShadowCon will once again highlight some of NCTM's best speakers who'll share their ideas on a variety of topics. As always, the goal of ShadowCon is to expand access to and extend your engagement with those ideas. So each speaker's ten-minute talk will serve as a launching point for a unique online experience. You won't want to miss this! The event is organized and hosted by Dan Meyer, Mike Flynn, and Zachary Champagne.

Walter E. Washington Convention Center, Ballroom B









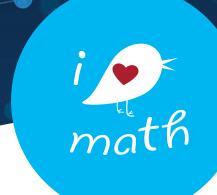






Passionate about math? Embrace the

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NCTM provides you with resources to learn, engage, and connect.

Learn from your peers and experts. We offer professional development through NCTM's conferences and events.

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These lessons address a mathematical topic and support effective teaching practices.

Four new just added!

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NCTM's award-winning journals provide activities, pedagogical strategies, and links between education research and practice. Membership includes one **FREE** subscription to a school journal and access to online archives.

Teaching Children Mathematics Mathematics Teaching in the Middle School Mathematics Teacher

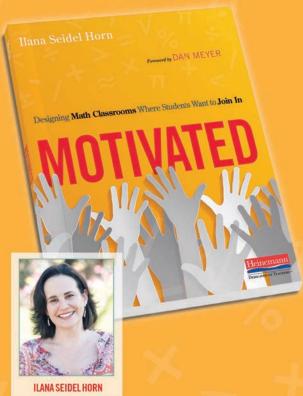
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NCTM Members benefit from resources that help engage students in learning mathematics. Visit **nctm.org/iheartmath**.



Blank stares? One-word answers? Sound like your math students? Darticipating in math class feels so



Participating in math class feels socially risky to students. Staying silent often feels safer.

In *Motivated*, Ilana Seidel Horn shows why certain teaching strategies create classroom climates where students want to join in.

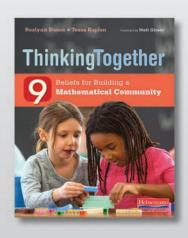
- Explore the **key factors** of motivational math classrooms.
- Discover **strategies** for weaving each factor into your instruction.
- Meet six math teachers who found that motivation requires more than an interesting problem.

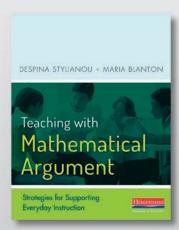
By examining what works in other classrooms and following the example of been-there teachers, you'll start changing slumped shoulders and blank stares into energetic, engaged learners.

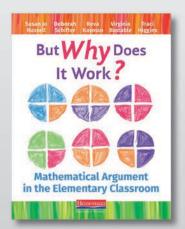
Available at Heinemann booth #333

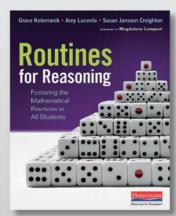


Also from Heinemann









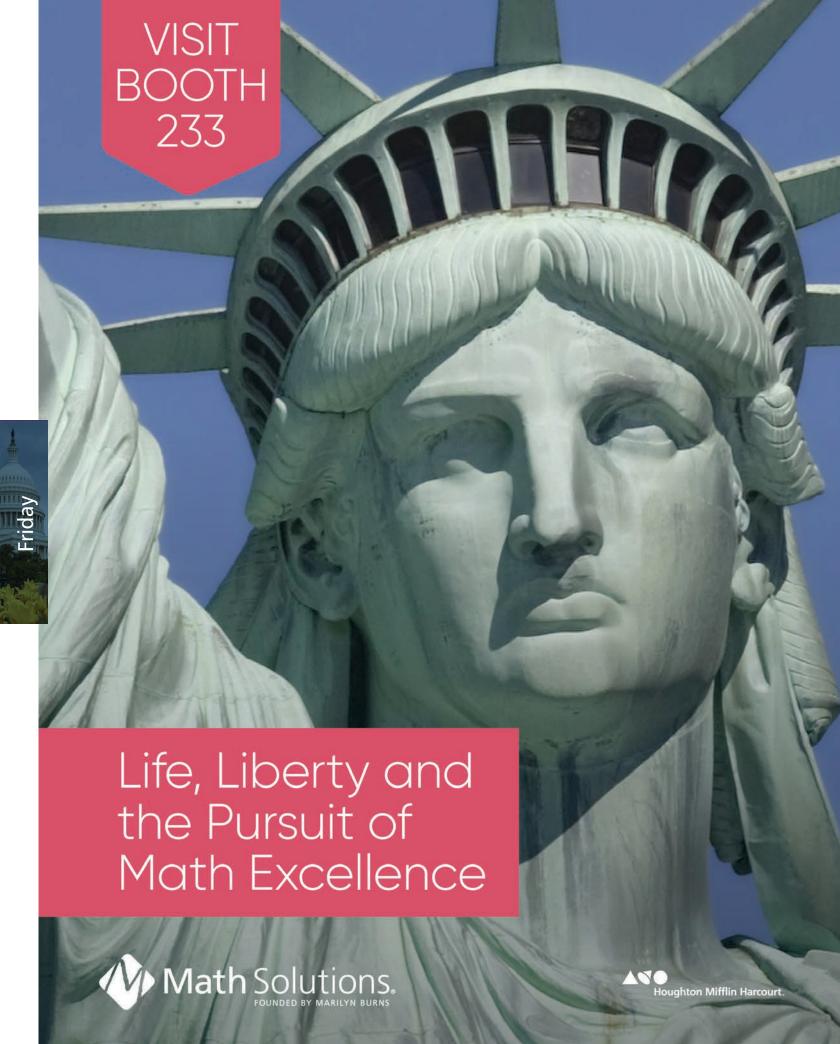














HIGHLIGHTS

Full Stack Lessons, 264

Putting the Focus Back on Teaching: Problems That Combine Fluency, Reasoning & Fun!, 277

Your Professional Journey in Mathematics: The Five Secrets of Great Teachers!, 338

Iris Carl Address: Taking a Knee in Mathematics Education—Moving from Equity Discourse to Protest and Refusal, 379

Enticing All Students to Contribute to Rich Math Discussions, 423

President-Elect Address: Catalyzing Change: Identity, Agency, Positioning, and Equitable Instructional Practices, 439

New Teacher Celebration, 518

Ignite! We'll Enlighten You and We'll Make It Quick, 557

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REGISTRATION HOURS

7:00 a.m.—5:00 p.m.

EXHIBIT HOURS

8:00 a.m.-5:00 p.m.

NCTM CENTRAL HOURS

8:00 a.m.-5:00 p.m.

FIRE CODES

We have made every attempt to provide adequate seating for participants at the conference, but for your safety and because of fire regulations, only those with seats will be allowed in meeting rooms. To comply with fire codes, we will have to ask persons sitting on the floor or standing to leave the room.

Networ	king Lounge: Presentation Area
9:00 a.m.– 9:20 a.m.	Session Building Number Sense and Reasoning in Just a Few Minutes John SanGivoanni
9:30 a.m.– 9:50 a.m.	Book Talk Principles to Actions: Ensuring Mathematical Success for All Diane Briars
10:00 a.m.– 10:20 a.m.	NCTM Session Understanding Your NCTM Membership MARC Committee
10:30 a.m.– 10:50 a.m.	Session Formative Assessment Beth Kobett, Skip Fennell, and Jon Wray
11:00 a.m.– 11:20 a.m.	Author Talk Reimagining the Mathematics Classroom* Carolee Koehn Hurtado, Cathery Yeh, and Mark William Ellis
11:30 a.m.– 11:50 a.m.	NCTM Session Catalyzing Change: From a Teacher's Perspective Paul Kelley
12:00 p.m.– 12:20 p.m.	Session Pattern Play Michael Fenton
12:30 p.m.– 12:50 p.m.	Author Talk Taking Action: Implementing Effective Mathematics Teaching Practices in Grades 9–12* Fred Dillon
1:00 p.m.– 1:20 p.m.	NCTM Session Getting the Most Out of the My NCTM community NCTM Staff
1:30 p.m.– 1:50 p.m.	Session Twitter 101 Zak Champagne
2:00 p.m.– 2:20 p.m.	Author Talk High-Yield Routines* Ann McCoy, Joann Barnett, and Emily Combs
2:30 p.m.– 2:50 p.m.	NCTM Session Catalyzing Change: Critical Conversations Jen Curtis
3:00 p.m.– 3:20 p.m.	Session Monopoly and Mathematics Gail Burrill
3:30 p.m.– 3:50 p.m.	Author Talk Access and Equity: Promoting High-Quality Mathematics Dorothy White
4:00 p.m.– 4:20 p.m.	NCTM Session Resources Available to Members Classroom Resources Committee (CRC)
4:30 p.m.– 4:50 p.m.	NCTM Session Publishing with NCTM Books Publishing Committee

^{*} Author will be available after talk for book signing

Networking Lounge: Math Circles		
9:00 a.m.– 10:30 a.m.	The Geometry of SET Brianna Donaldson and Laurie James	
11:00 a.m.– 12:30 p.m.	Exploding Dots: Global Math Week 2018 Preview James Tanton	
1:00 p.m.– 2:30 p.m.	Folding Fractals Joshua Zucker	
3:00 p.m.– 4:30 p.m.	Taxicab Geometry Henri Picciotto	

255 TLC

Activities for Transitioning Students from Precalculus to AP Calculus

10-12 Session

Activities designed to transition precalculus students to the vocabulary, notation, and rigor of AP Calculus will be shared. Participants will explore strategies for introducing the four methods of relating AP Calculus solutions (graphical, numerical, analytical, verbal) into the precalculus curriculum as well as appropriate assessment techniques.

Kathy VanderBee

Kentwood Public Schools, Michigan

Barbara Montgomery

Kentwood Public Schools, Michigan

Walter E. Washington Convention Center, 154 AB

256 1



Algebraic Procedures Needing a Conceptual Makeover

8-10 Session

To often algebraic procedures are whittled down to a flowchart or a gimmick. The Mathematics Teaching Practices include building procedural fluency from conceptual understanding. In this session, we will examine some of these procedures, explore tasks that help students build conceptual understanding, and discuss the connections between the two.

Karen McPherson

y
@nc teach

Buncombe County Schools, Asheville, North Carolina

Walter E. Washington Convention Center, 147 B

257



Assessment and Actions: Effective Strategies to Engage Teachers and Students in Continued Learning

6-8 Session

How can assessments motivate and engage each and every learner? How can they be used for learning? High-quality assessments, which include content and process standards, inform both teachers and students about what has been learned and what has not been learned yet. Come experience four actions needed to create a meaningful assessment process.

Sarah Schuhl

@SSchuhl

On Target Student Learning, Gresham, Oregon

Mona Toncheff

AZ Mathematics Partnership, Phoenix, Arizona

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

258 ASSESS

Building a Flexible Standards-Based Classroom within a Traditional School Setting

10-12 Session

Moving to a standards-based grading system in a school that uses a traditional model can be difficult. This session will explore ways to smoothly transition your students, parents, and perhaps even a few colleagues to a standards-based system while still working within your curriculum and school policies.

Robert Janes

@MrJanesMath

Capitol Region Education Council (CREC), Hartford, Connecticut

Walter E. Washington Convention Center, 145 AB











Capturing Mathematical Thinking in the **Elementary Grades**

Pre-K-2 Session

Elementary teachers, especially K-2, are often hardpressed to find classroom activities or assessments that gather quality evidence about a student's ability to problem-solve, communicate, or model with mathematics. Come learn about a teacher-led writing project committed to designing assessments that capture evidence beyond the procedural.

Solana Lee

Callahan Consulting, Los Angeles, California Jessica Balli

Callahan Consulting, San Diego, California

Walter E. Washington Convention Center, Salon G



Concepts and Routines for High School Classrooms: What We Can Learn from Elementary

8-10 Session

Having transitioned from a high school math teacher into a role supporting K-12, I have learned so much from elementary classrooms about how concepts in number and patterning develop across the years. Come explore how these powerful foundations, and classroom routines, can extend into high school level concepts of number, algebra, and functions.

Marc Garneau

🔰@314Piman

District Education Centre, Surrey, British Columbia, Canada

Walter E. Washington Convention Center, 202 A



Enrichment & Foundations: Supporting Strong Students in a Low-Income Classroom

6-8 Session

"I want to be an engineer." "I like math because it's easy." We will present lessons from six years of running Bridge to Enter Advanced Mathematics (BEAM), how to use a combination of enrichment (logic, puzzles, number theory) and foundations (the why of math) to challenge and support strong students in a low-income classroom.

Lynn Cartwright-Punnett

@beammathnyc

Bridge to Enter Advanced Mathematics, New York, New York Malcolm Eckel

Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

Marriott Marquis, Liberty Ballroom L (Level M4)



From Number Lines to Logarithms: How Forgotten Instincts Can Spark Deeper Understanding

General Interest Session

Research suggests that logarithmic thinking is innate. We are born with a number line in our heads, but the numbers are spaced in equal RATIOS instead of equal distances. We will explore how reigniting this instinct can pave an enlightened pathway from number properties and fractions, through ratios and means, to rational exponents and logarithms.

Emily Allman

@allmanfiles

Ipswich High School, Massachusetts

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)











264 TLC **Full Stack Lessons**

General Interest Session

Two teachers can take the same idea for a lesson and experience vastly different results in class. This is often because one teacher taught from the full "stack" of questions and the other taught from just part of it. We'll look at the contents of that stack and learn how to put the full stack of questions to work in your classes.

Dan Meyer

@ddmeyer

Desmos, San Francisco, California

Walter E. Washington Convention Center, Ballroom A

265 TLC

Interesting Types of Numbers: Using Enjoyment to Strengthen Number Sense and Confidence

6-8 Session

This session will focus on work with a variety of interesting types of numbers, including abundant, deficient, perfect, semiperfect, friendly, weird, happy, vampire, untouchable, lazy caterer, narcissistic, and McNugget numbers. Session participants will share ideas for incorporating number enjoyment into standards-based lessons.

William Lacefield

Mercer University, Atlanta, Georgia

Walter E. Washington Convention Center, 103 B

266 ASSESS

Leading Learners to Level Up: Deepening Understanding of Mathematical Practices

Coaches/Leaders/Teacher Educators Session

We say: Persevere! Express regularity in repeated reasoning! Be precise! Show your work! . . . But what if I can't yet? How might we make our thinking visible to empower our learners to become self-correcting, self-reliant, and independent? How do we coach—what strategies do we use—to help learners to embrace the Standards for Mathematical Practice?

Jill Gough

y @jgough

Trinity School, Atlanta, Georgia

Jennifer Wilson

Northwest Rankin High School, Jackson, Mississippi

Walter E. Washington Convention Center, Salon C

A&E **Let's Not Shy Away from Critical Conversations**

General Interest Session

To eliminate inequities in mathematics education we must recognize their existence, challenge the status quo, and engage in deep conversations. Participation in superficial equity discussions, with too much caution, and without any actionable steps has not made change. Let's acknowledge, act on, and be accountable for social justice in mathematics.

Nora Ramirez

TODOS: Mathematics for ALL, Tempe, Arizona

Walter E. Washington Convention Center, Ballroom B Reflection Cove following presentation.













Making Math Meaningful with Literature

3-5 Session

Have you tried using picture books to engage your students in math? Come discover great children's literature that can be used to develop deep conceptual understanding of math concepts with meaningful concrete activities that will motivate your students to learn. Leave with a list of literature resources and activities your students will love!

Kristin Hilty

@kahflyers

Staff Development for Educators, Kettering, Ohio

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

269 A&E

Making Meaning: Using Reading Comprehension Strategies to Enhance Mathematical Understanding

6-8 Session

A commonality for success in reading and mathematics is the need for students to construct meaning. Participants will explore familiar reading comprehension strategies to help students delve deeper into mathematical understanding. Join us as we investigate literacy connections that promote learning and inform instructional decisions.

Kristen Karbon

७@Klick816

Boulan Park Middle School, Troy, Michigan

Denise McDowell

Big Ideas Learning, Erie, Pennsylvania

Walter E. Washington Convention Center, 140 AB

270 TLC

Math Workshop: 3 Classroom Structures That Support Guided Math & Learning Stations

3-5 Session

Participants will learn WHY Math Workshop is a valuable model for instruction and HOW to establish routines and procedures that help get differentiated guided groups and learning stations up and running. Participants will gain a solid understanding of the different structures within Math Workshop and be able to see how it fits into a K–5 math class.

Jennifer Lempp

y@lempp5

Fairfax County Public Schools, Virginia

Walter E. Washington Convention Center, Salon I

271 CCC

Matrices Are Not Boring, They Are Transformative!

10-12 Session

Using transformational geometry as a context for exploring matrices provides connections across multiple conceptual categories of the high school curriculum, including number and quantity, functions, geometry, and algebra. Moreover, using mathematical action technology such as dynamic geometry can bring these relationships to life!

W. Gary Martin

🏏@wgarym

Auburn University, Alabama

Walter E. Washington Convention Center, 151 A

272 MODEL

Moana the Navigator: Polynesian Navigation (by Stars, Wind, and Currents) and Celestial Navigation

General Interest Session

Explore the navigation (by the stars, the currents, and winds) of the ancient Polynesian mariners, as Moana discovered it. Other forms of navigation, including celestial navigation, will also be discussed. How do we find our way across thousands of miles of ocean? Come to this workshop and find out.

Thomas Walsh

Kean University, Union, New Jersey

Walter E. Washington Convention Center, 146 C











273 MODEL

Model Drawing for Problem Solving

3-5 Session

Struggling with problem solving? Would you like to help your upper elementary school students become better problem solvers? Model drawing could be the solution for you. Help students develop a visual context for word problems and build a bridge between concrete and abstract thinking when problem solving.

Amy Southworth

Chesterfield County Public Schools, Midlothian, Virginia Allison Ferguson

Chesterfield County Public Schools, Midlothian, Virginia

Marriott Marquis, Liberty Ballroom M (Level M4)

274 ISSUES

NCTM Business Meeting

General Interest Session

Join NCTM leadership for an overview of recent activities and strategic priorities for the coming year.

Matt Larson

President, National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, 203 AB

275 TLC

Primary Number Talks with a Hands-on Approach

Pre-K-2 Session

How do you get all students to join the conversation during number talks? Could access to a variety of mathematical tools unleash the communication of your students who are at the concrete level of thinking? Learn how to facilitate number talks that encourage connections among multiple representations (concrete-representational-abstract).

Christina Sherman

y @chrissybug24

Hamilton County ESC, Cincinnati, Ohio

Anne Berger

Hamilton County ESC, Cincinnati, Ohio

Kelly Wegener

Hamilton County ESC, Cincinnati, Ohio

Walter E. Washington Convention Center, 152 A

Reflection Cove following presentation.

276 CCC

Proofs in Geometry Using Transformations: How to Leverage Transformational Reasoning

8-10 Session

The Common Core Mathematics Standards, and many individual state standards, define congruence and similarity in terms of transformations and encourage teachers to integrate transformational reasoning in proof arguments. This session will discuss the rationale and potential advantages for this approach using several illustrative examples.

Alan O'Bryan

Arizona State University, Tempe

Grant Sander

Arizona State University, Tempe

Marilyn Carlson

Arizona State University, Tempe

Walter E. Washington Convention Center, 102 AB

277 ISSUES

Putting the Focus Back on Teaching: Problems That Combine Fluency, Reasoning & Fun!

General Interest Session

Computational skills are clearly important, but reasoning and metacognitive skills are the key to higher math. We will explore cleverly designed problems that develop all three skills while challenging kids and making them excited about math. Standards, curriculums, and mindsets have all changed for the better. Now it is time to focus on teaching!

Greg Tang

@gregtangmath

GregTangMath.com, Belmont, Massachusetts

Walter E. Washington Convention Center, Ballroom C











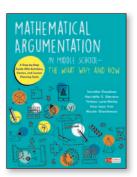




Supporting Teachers, Empowering Learners

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Get them talking: Your formula for bringing math concepts to life!

Jennifer Knudsen, Harriette S. Stevens, Teresa Lara-Meloy, Hee-Joon Kim, Nicole Shechtman Grades: 6–8, ISBN: 978-1-5063-7669-1

Author Meet and Greet: Friday, April 27 12:00 PM



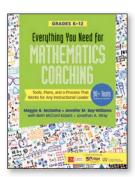
Your blueprint to planning K-2 math lessons for maximum impact and understanding!

Beth McCord Kobett, Ruth Harbin Miles, Lois A. Williams

Grades: K-2,

ISBN: 978-1-5063-8781-9

Author Meet and Greet: Friday, April 27 11:30 AM



Plan, focus, and lead: Your toolkit for inspiring math teachers!

Maggie B. McGatha, Jennifer M. Bay-Williams, Beth McCord Kobett, Jonathan A. Wray

Grades: K-12,

ISBN: 978-1-5443-1698-7

Author Meet and Greet: Thursday, April 26 12:30 PM

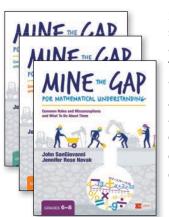


Move the needle on math instruction with these 5 assessment techniques!

Francis (Skip) Fennell, Beth McCord Kobett, and Jonathan A. Wray

Grades: K-8, ISBN: 978-1-5063-3750-0

Author Meet and Greet: Friday, April 27 3:00 PM

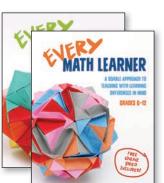


See what's going on in your students' minds, plus get access to 340 rich tasks to use in instruction or assessment!

John SanGiovanni, Jennifer Rose Novak

Grades: K-2, ISBN: 978-1-5063-3768-5 **Grades: 3-5,** ISBN: 978-1-5063-3767-8 **Grades: 6-8,** ISBN: 978-1-5063-7982-1

Author Meet and Greet: Friday, April 27 12:30 PM



Differentiation that shifts your instruction and boosts ALL student learning!

Nanci N. Smith

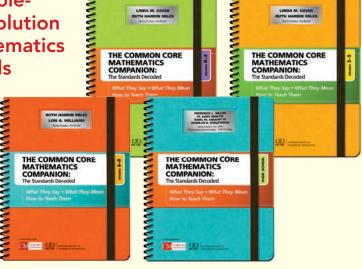
Grades: K-5, ISBN: 978-1-5063-4073-9

Grades: 6-12,

ISBN: 978-1-5063-4074-6

Author Meet and Greet: Thursday, April 26 12:00 PM

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Ruth Harbin Miles and Lois Williams Grades: 6–8. ISBN: 978-1-5063-3219-2

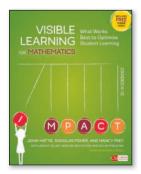
Frederick Dillon, W. Gary Martin, Basil M. Conway IV, and Marilyn E. Strutchens High School, ISBN: 978-1-5063-3226-0

Author Meet and Greet: Thursday, April 26 1:00 PM

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278 TLC

Starting Proof Off Right: Engaging Students with Research-Based Strategies in Geometry

Research Session

We share a pedagogical framework for introducing proof in secondary geometry. This framework includes a targeted, research-based list of sub-goals aimed at preparing students to productively engage with proof. Classroom teachers who have used the framework and associated tasks report on what they learned through a collaborative research project.

Michelle Cirillo

@UDMichy

University of Delaware, Newark

Rachelle Bull

William Penn High School, New Castle, Delaware

Amy Huebner

A.I. duPont High School, Wilmington, Delaware

Walter E. Washington Convention Center, 204 C

279 TECH

Synchronous Online Meetings + Asynchronous Independent Learning = The Future of Math Instruction

10-12 Session

How can you start teaching math online and duplicate the rich interaction in your brick-and-mortar classroom with students around the globe? Learn best practices from teachers providing synchronous and asynchronous small-group instruction of calculus and financial algebra. Explore how to fuse cutting-edge technology and effective classroom methods.

Julien Meyer

Severn School, Severna Park, Maryland

Joshua Link

Maret School, Washington, D.C.

Marriott Marquis, Independence Ballroom D (Level M4)

280 TLC

Teaching Probability with Purpose

10-12 Session

Probability is often taught as its own end, but asking "what is the probability" isn't interesting when it has no purpose. In this session, probability will be put to important statistical purposes—making decisions that affect millions (really!) of people and winning games. Technology will be used to compute difficult probabilities.

Douglas Tyson

y @tyson_doug

Central York High School, Pennsylvania

Walter E. Washington Convention Center, 146 B

281 CCC

The Number Core: How Do Young Students Learn about Numbers?

Pre-K-2 Session

Effectively sequencing how you teach numbers 1–5, 6–10, and then 10–20 MATTERS! Teaching number in the primary years is deceptively simple. After we peer into the classroom through video, walk away with strategies for teaching primary students to count, interpret, understand, and use numbers to problem solve using developmentally appropriate models.

Lacy Endo-Peery

Great Minds, Woodland Hills, California

Marriott Marquis, Independence Ballroom F-H (Level M4)

282 TLC

Transform Your Students' Thinking about Geometry

8-10 Session

Participants will explore hands-on activities and problems that offer middle grades mathematics teachers the opportunities to deepen their understanding of challenging concepts in geometric transformation such as translation and rotation as outlined in the Common Core State Standards.

Nikita Patterson

Georgia State University, Atlanta

Walter E. Washington Convention Center, 150 A











Welcome to the Twitter-verse for the 21st-Century Math Educator

6-8 Session

In this session participants learn how to use Twitter to enhance their individual PD and how to build a strong PLN. Every day, thousands of educators will learn not only how to use Twitter and the language behind it but also how to find professional topics that will benefit them.

Brian Bussiere

@Mr_Bussiere

Epsom Central School, New Hampshire

Marriott Marguis, Marguis Ballroom Salon 14 (Level M2)



What Does the Graph Say? Forcing Students to Think

8-10 Session

Why do many of our students avoid graphing? See the power of exploring functions, solving equations, factoring, and the unit circle, by looking at how the equations and expressions relate to a graph. Expand student conceptual understanding through unique tasks that connect students mentally and physically to the math.

Jennifer North Morris

@jnomo

Marana High School, Tucson, Arizona

Marriott Marquis, Liberty Ballroom N-P (Level M4)

285 MODEL

Zombie Apocalypses and Other Advances in Minecraft Math

8-10 Session

Ever wonder if a zombie apocalypse was exponential? This and other mathematical relationships will be explored in this session. Using a sandbox virtual environment, like Minecraft, as a BYOD support, this session will demonstrate its many uses as an Engage and Exploration tool. What can you do if students engaged for five more minutes each day?

David Henson

@MinecraftMath

Education Center, Grand Prairie, Texas

Walter E. Washington Convention Center, 146 A

ew I tlc

Bridges Intervention—Delivering Clear and Systematic Instruction

General Interest Exhibitor Workshop

Searching for an effective K–5 intervention resource with built-in assessments and frequent progress monitoring? Discover how Bridges Intervention uses the power of visual models to reach struggling students. Organized by content rather than grade, each session includes warm-ups, lessons, and practice pages focused on key standards.

The Math Learning Center

Salem, Oregon

Walter E. Washington Convention Center, 158 AB

285.2 **ew** TLC

Two Keys to Learning Fractions

3-5 Exhibitor Workshop

Understanding the notation and equivalence fluency are two keys to learning fractions. How do we integrate learning experiences while teaching equivalent fractions? Learn how to use pictures, paper folding and a wide range of manipulatives to help your students understand and work with fractions.

Shing Lee Publishers

Singapore

Walter E. Washington Convention Center, 143 C

285.3 **CW** MODEL

Middle Grades & High School Engage in Reality-Based Mathematical Modeling

General Interest Exhibitor Workshop

MYTH: Build it and they will come. Truth: How reality-based scenarios can attract students to mathematical modeling. Dive into unique modeling lessons that present engaging, high interest situations. Unlike traditional real-world problems, reality-based mathematical modeling lessons present students with the modeling conceptual category.

Pearson Learning Services

Chandler, Arizona

Walter E. Washington Convention Center, 159 AB













Help PK-6 Students Draw Their Way to Understanding with Math Expressions

Coaches/Leaders/Teacher Educators **Exhibitor Workshop**

Teachers will learn a variety of researched math drawing models Dr. Karen Fuson uses to represent addition/subtraction/multiplication/division problems from math expressions. We will explore comparison bars, rectangle sections, place value sections for division, and many more that support student understanding and acquisition of algorithms.

Houghton Mifflin Harcourt

Austin, Texas

Walter E. Washington Convention Center, 156

8:00 A.M.-9:15 A.M.

286 TLC

A Revolution in Classroom Talk: Create a Culture of Exploratory Talk through **Talking Points**

10-12 Workshop

Exploratory talk is the greatest single predictor of whether students' group work will be rich and effective, yet it remains difficult to find meaningful resources to help deepen and improve the quality of student talk. In this session, we will explore Talking Points, an evidence-based technique for cultivating high-quality student math talk.

Elizabeth Statmore

@cheesemonkeysf

Lowell High School, San Francisco, California

Walter E. Washington Convention Center, 207 A

287

MODEL

Astonishing Math: Improving Your **Chances of Winning the Locker Game**

10-12 Workshop

The Locker Game is one of the most astonishing math activities your students will ever experience. We will develop strategies for "winning" the game and then use probability, combinatorial reasoning, and calculus to analyze these strategies. The results are stunning! This two- or three-day activity is great anytime but especially after an AP exam.

James Matthews

Siena College, Old Chatham, New York

Walter E. Washington Convention Center, Salon H

288 A&E

Calculated Change: Social Justice in the Math Classroom

8-10 Workshop

Would you like to put more activism into your math classroom? We will explore meaningful, relevant questions in math class to impact student learning and create experiences that will follow them throughout their lives. Participants will learn how to help students become equipped to understand the challenges they will face in the future.

Amanda Riske

@akariske

Georgetown Day School, New York, New York

David Peabody

Seattle, Washington

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

Check out the **Exhibitor Workshops!**















Capturing the Action of the Operations: Bringing Meaning and Clarity to Representations

3-5 Workshop

Mathematical operations have distinct characteristics that can be challenging to communicate with words, representations, and symbols. Math ideas can be lost in translation between physical movements to static representations. We are looking at the support we can offer to support the precise communication of important ideas about operations.

Kaneka Turner

@kanekaturner

Independent Education Consultant, Charlotte, North Carolina Marta Garcia

Independent Education Consultant, Wilmington, North Carolina Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

290 MODEL

Constructing Origami Boxes for Mathematical Enrichment

10-12 Workshop

During the session we will construct an origami box and discuss mathematical ideas that emerge from the construction of the box. We will explore the relationship between the dimensions of the rectangular sheet and the dimensions of the constructed box. We will also explore the volume of the constructed box using graphing technology.

Arsalan Wares

Valdosta State University, Georgia

Walter E. Washington Convention Center, 152 B

291 MODEL

Developing a Deeper Understanding of Mathematical Modeling in K-Grade 5

Coaches/Leaders/Teacher Educators Workshop

Join us as we explore Standards for Mathematical Practice 4 (Model with mathematics) across K-grade 5 through tasks that require students to use models to solve challenging tasks. We will examine student work samples and create a display to better understand how mathematical modeling progresses across the elementary grades.

Mary Ellen Dairyko

UChicago STEM Education, Illinois

Rachel Muren

UChicago STEM Education, Illinois

Amanda Zimolzak

University of Chicago, Illinois

Walter E. Washington Convention Center, 101

292 PROF

Eyes on Learning: Collaborative **Professional Learning with the Instructional Practices Inventory**

Coaches/Leaders/Teacher Educators Workshop

Implementation of research-based instructional practice requires teachers to develop "new eyes" for looking at how students engage with mathematical ideas. This session introduces the Instructional Practices Inventory, a free resource, and shows how this tool can focus peer coaching and collaborative professional learning.

Susan Chapman

University of Houston-Clear Lake, Texas

Mary Mitchell

Math Solutions, Boston, Massachusetts

Walter E. Washington Convention Center, 204 AB













Fluency: Facts or Fiction?

Pre-K-2 Workshop

"Why don't these kids know their facts?!" is one of the most common frustrations in math teaching. In this session, participants will learn the definition of fluency (it's more than just memorizing facts!), engaging strategies to support students in their journey to mathematical fluency, and opportunities for ongoing formative assessment of fluency.

Jamie Garner

@mavenofmath

Stanislaus County Office of Education, Modesto, California

Walter E. Washington Convention Center, 201

294 TLC

Great Tasks Lead to Great Talks: High **Cognitive Lessons, Games, & Math Talks** to Encourage Discourse

3-5 Workshop

Let's give our math students something to talk about! Engage in rich, classroom-tested activities as you learn how to select high cognitive tasks and facilitate meaningful discourse. Learn how re-engagement strategies and purposeful questioning can help students make sense of mathematics and develop both conceptual and procedural understanding.

Elizabeth Cape

University of Illinois at Chicago Teaching Integrated Math and Science Project

Jennifer Leimberer

University of Illinois at Chicago

Sandra Niemiera

Concordia University Chicago, Bolingbrook, Illinois

Walter E. Washington Convention Center, 151 B

High Tech, Low Tech: Finding the **Balance**

8-10 Workshop

From logarithm tables to slide rule to graphing calculator to Desmos, the math classroom looks different than it used to. How much is too much? When does technology get in the way of content and when does it illuminate ideas? This workshop will explore ways we can determine when and how to use technology to help students learn.

Breedeen Pickford-Murray

@btwnthenumbers

The Bay School of San Francisco, California

Walter E. Washington Convention Center, 103 A

296 CCC

How Does the Area Model Build Conceptual Understanding?

3-5 Workshop

How does the area model develop conceptual understanding of multiplication and division from single-digit numbers to multi-digit numbers? Building a solid understanding of the area model with whole numbers leads to a smooth transition in using the area model with fractions and decimals.

Ruby Norland

@RubyNorland

Somerset Academy, Henderson, Nevada

Bethany Farmer

Doral Academy, Las Vegas, Nevada

Walter E. Washington Convention Center, 143 AB

Let's Develop Number Sense in K-Grade 2 with Math Games!

Pre-K-2 Workshop

Teachers in K–grade 2 will play a variety of math games. These games are designed to help children develop a sense of whole numbers and represent and use them in flexible ways. Teachers will receive a packet of twenty games for developing number and operation sense, place value, basic facts, and whole number comparison, and computation.

Nancy Smith

Emporia State University, Kansas

Marvin Harrell

Emporia State University, Kansas

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)











Logic and Reasoning in Rigorous Tasks

3-5 Workshop

Have you picked a task and found that it lacked in your student's ability to reason logically? In this session, we will explore components of tasks that focus on logic and reasonableness. Participants will actively engage in tasks that promote self-recognition of reasonableness among students as well as encourage logical estimation.

Jennifer Stairs

Howard County Public Schools, Columbia, Maryland Maria Merrill

Howard County Public Schools, Laurel, Maryland

Walter E. Washington Convention Center, 149 AB

299 TLC

Math Then and Now: What's Really Changed?

8-10 Workshop

Math is the same, but HOW we help students learn and demonstrate their math understanding has changed. This is a challenge because we didn't learn like this. We will discuss how to improve student relationships with math using a variety of strategies and resources. Learn where to find amazing resources and how to use them to help your students grow.

Nanette Johnson

> @Math_m_Addicts

Downey Unified School District, Cypress, California

Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)

300 TLC

Paper Folding in Class? Not Just for Paper Airplanes Anymore!

10-12 Workshop

Folding a crane is fun, but did you know that origami can be used to do "real" math? Using paper, students can fold parabolas and other conics. Learn how paper folding can be a construction tool that enables finding solutions to quadratic and cubic equations. The folding serves as a hands-on motivation for students to then explore with math.

Gary Rubinstein

New York, New York

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

301 CCC

Multiplication and Division: Whole Numbers to Fractions, Decimals, and Integers

6-8 Workshop

We will use DigiBlocks, fraction tiles, and two-colored counters to explore how the equal groups/scaling/area meanings of multiplication and the sharing/grouping meanings of division can be used to develop meaning for the multiplication and division of fractions, decimals, and integers.

Nirmala Nutakki

Buffalo State College, New York

Kathy Lambert

Cheektowaga Central School District, New York

Lenette Braddock

Cheektowaga Central School District, New York

Walter E. Washington Convention Center, 202 B

New to teaching? Get answers to pivotal questions and concerns of new and soon-to-be teachers through the **New Teacher Strand**.













302 NEW T

New Teacher Strand: Pre-K-6: Classroom Management, Motivation, and Math

Pre-K-2 Workshop

In elementary classrooms it's all intertwined. As a (new) teacher being able to establish consistent and positive classroom management, motivating and supporting students, and engaging the students in doing, thinking, and learning math is critical. Come experience and engage with us in how you can create and balance all three.

Jennifer Bay-Williams

University of Louisville, Kentucky

Marriott Marguis, Marguis Ballroom Salon 3 (Level M2)

303

Quadratic Equations and Functions: Use Manipulatives and Technology for More Access and More Depth

8-10 Workshop

Algebra manipulatives provide an environment where students can make sense of two ways to solve quadratic equations: factoring and completing the square. Graphing technology allows students to link those approaches to quadratic functions. Using these tools and connecting these concepts makes the algebra come to life for all students.

Henri Picciotto

@hpicciotto

MathEducationPage.org, Berkeley, California

Walter E. Washington Convention Center, 209 ABC

304 TLC

Routines to Grow Problem-Solving Strategies in Early Childhood

Pre-K-2 Workshop

In this workshop, we will share how specific non-routine problems can be used to develop K–2 students' essential problem-solving skills, strategies, and habits of mind. We will also share a fifteen-minute problem-solving routine we developed and examine how the structure of this routine transformed students' mathematical reasoning and writing.

Antonia Cameron

Metamorphosis Teaching Learning Communities, New York, New York

Rachel Michael

NYC Department of Education, New York, New York

Renee McShane

Metamorphosis Teaching Learning Communities, New York, New York

Walter E. Washington Convention Center, 144 ABC

305

STEM Storytelling: Using Picture Books to Integrate Mathematics

Pre-K-2 Workshop

Join us for two STEM activities based on the picture books *Listen to Our World* and *The Most Magnificent Thing.* Connect math and literature using manipulatives to classify animals into habitats and to engineer a pet transport. Progression through K–2 standards such as counting, graphing, using money, and measuring length will be emphasized.

Lindsey Herlehy

Illinois Mathematics and Science Academy, Aurora

Karen Togliatti

Illinois Mathematics and Science Academy, Aurora

Marriott Marquis, Liberty Ballroom I-K (Level M4)



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306 TLC

Teaching through Problem Solving: Using SMP's for Exploring Division with Fractions for ALL Students

3-5 Workshop

Participants will explore fraction division through hands-on investigations. A variety of tasks, visual models, work samples, and videos will be analyzed to connect conceptual understanding to the procedural fluency of dividing fractions from grades 3–7. Handouts will be provided and door prizes will be drawn for some resources used in the session.

Nicolette Nalu

University of Alabama, Tuscaloosa **Amy Tilford**

Tuscaloosa City Schools/University of Alabama

Walter E. Washington Convention Center, 206

307 TLC

The Clothesline Grows Up: Functions on the Number Line

8-10 Workshop

The Clothesline is popularly being used to teach conceptual understanding of algebra, geometry, and statistics. Now experience functions like you never have . . . on an open number. Learn how this manipulable tool teaches students the quantitative reasoning needed for linear, exponential, quadratic, polynomial, and rational functions. clotheslinemath.com

Chris Shore

@MathProjects

The Math Projects Journal/Temecula Valley USD, Murrieta, California

Walter E. Washington Convention Center, 207 B

307.1 TLC Conceptual Understanding and Problem Solving

6-8 Workshop

Conceptual understanding can be built from student problem solving with carefully scaffolded activities and routines such as Notice and Wonder. We will dive deep in doing math and looking at our own practices, followed by review of related student problem solving in order to understand and facilitate the development of mathematical practices.

Stephen Weimar

y ⊚sweimar

21st Century Partnership for STEM Education, Conshohocken, Pennsylvania

Marriott Marquis, Independence Ballroom A-C (Level M4)

308 TLC

The Rule of Four: Series Convergence Tests with a Rich Task and Multiple Representations

10-12 Workshop

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 a rich discovery task that uses multiple representations of partial sums to develop procedural fluency with convergence tests from conceptual understanding.

Laura Potter

@mrspottermath

Baltimore County Public Schools, Towson, Maryland

Marriott Marquis, Independence Ballroom E (Level M4)

309 TECH

There's an App for That! Developing & Representing Mathematical Thinking

3-5 Workshop

Explore six free apps that provide the means and models to explore essential questions, try out potential solutions, and justify results. Engage your students and integrate authentic technology in your lesson, and provide a platform for collaboration and inquiry. Discover how to access digital tools for inquiry and understanding.

Pia Hansen

Cheyenne, Wyoming

Walter E. Washington Convention Center, 147 A











Visualizing Addition and Subtraction through Models and Strategies

Pre-K-2 Workshop

Empowering students toward procedural fluency begins with developing conceptual understanding through the use of visual models. These models lay the foundation so that thinking strategies can be used for accessing basic facts and beyond. Explore the importance of coupling conceptual understanding and procedural fluency over time.

Rob Nickerson

ORIGO Education, Lakewood, Colorado

Walter E. Washington Convention Center, 150 B

9:30 A.M.-10:30 A.M.

311

Advanced Algebra with Financial Applications—Engaging, Rigorous **Mathematics for All Students!**

10-12 Session

A hybrid of selected topics from algebra 2, statistics, trigonometry, geometry, probability, and precalculus is used to cover topics that truly raise student interest. Sophisticated mathematics is used to tackle problems in banking, credit, income taxes, auto insurance, employment, mortgages, home maintenance, budgeting, and much, much more.

Robert Gerver

Institute for Creative Problem Solving, Kings Park, New York Richard Sgroi

Retired, Bedford Schools, Rhinebeck, New York

Walter E. Washington Convention Center, Salon C

Approaching Integers from a Problem— Solving Perspective by Building on First to Eighth Graders' Thinking

6-8 Session

Students often learn procedures or gimmicks for operating on integers. This presentation/discussion session will approach integers from a problemsolving perspective that builds on students' informal understandings of negative numbers. Video clips of grade 1-8 children solving problems will be used to demonstrate children's thinking.

Randolph Philipp

San Diego State University, California

Walter E. Washington Convention Center, 145 AB

Bright Lights on the Horizon

General Interest Session

What do a square-wheeled bicycle, a 17th-century French painting, and the Indiana legislature all have in common? They appear among the writings of some of mathematics' best expositors in Math Horizons, the MAA's undergraduate student magazine.

Deanna Haunsperger

★@DeannaHMath

Carleton College, Northfield, Minnesota

Marriott Marquis, Liberty Ballroom M (Level M4)

Crafting Powerful Number Talks in **Elementary Classrooms**

Pre-K-2 Session

Powerful and engaging number talks have the ability to far extend students' flexible thinking about number concepts. In this session, we discuss and provide video illustrations of number talks integrated into morning meeting routines, including important teaching moves such as selecting numbers, recording solutions, and leveraging student thinking.

Thomas Hodges

@tehodges

University of South Carolina, Columbia

George Roy

University of South Carolina, Columbia

Lindsay Head

Oak Pointe Elementary School, Irmo, South Carolina

Walter E. Washington Convention Center, 146 A

Reflection Cove following presentation.













315 A&E

Culturally Responsive Teaching in an Algebra 1 Class for Repeating 9th Graders

Research Session

This session will explore what it means to be a culturally responsive teacher for students enrolled in an algebra I course for repeating ninth graders. This research focused on classroom relationships, communication of high expectations, and student engagement in learning activities, using a teacher action-research design.

Jenny Van Buren

Anderson School District 1, Williamston, South Carolina

Walter E. Washington Convention Center, 103 B

316 TLC

Data Mining: An Example of Global Collaboration, Integration, and Math

8-10 Session

Applications of data mining projects have the potential to engage students in authentic global collaboration and mathematical inquiry to understand environmental/global issues. An example is presented in which students in two different locations collaborate gathering data and making inferences as they present their findings.

Yujiro Fujiwara

Christian Academy in Japan, Tokyo/Texas Tech University Richard Velasco

Pullman School District, Washington/Texas Tech University

Walter E. Washington Convention Center, 202 A

317 CHANGE

Creating Equitable Structures to Support Success in High School Mathematics

8-12 Session

Who is doing real mathematics in your school? Which teachers are assigned to various mathematics classes? How do the structures in your school contribute to creating success for students? Join us for a lively discussion on *Catalyzing Change* and share your ideas with colleagues on how to create equitable structures in our schools and districts.

John Staley

y@jstaley06

Baltimore County Public Schools, Maryland

Jennifer Curtis

Consultant, Durham, North Carolina

Damarrio Holloway

Discovery High School, Lawrenceville, Georgia

Walter E. Washington Convention Center, 151 A

318 CCC

Euler's Enduring Understandings: Making Sense of e from Algebra 1 to AP Calculus

10-12 Session

 $\ddot{\mathbf{l}}\in$ is relatively accessible to students, but meaningful understanding of e takes time. Participants will experience four technology-supported activities to help students to uncover e as a delightfully recurrent theme connecting algebra 1, geometry, algebra 2, and precalculus, and to build a firm foundation for AP Calculus's Big Ideas.

Stephanie Ogden

y @sosogden

L&N STEM Academy, Knoxville, Tennessee

Marriott Marguis, Independence Ballroom F-H (Level M4)











319 MODEL

Formative and Fun: Mathematical Modeling

6-8 Session

Classrooms with a formative assessment focus lead to greater student understanding. Participants will learn about how mathematical modeling can be used as a formative assessment to engage students and have them activate their prior knowledge.

Micah Stohlmann

University of Nevada, Las Vegas

Marriott Marquis, Independence Ballroom D (Level M4)

320 A&E

Furthering Girls' Math Identity: Research and Practice

Coaches/Leaders/Teacher Educators Session

The development of a positive math identity is key to girls' success in STEM. This session will explore researcher-practitioner partnerships specifically designed to foster middle school girls' identity in math as a means of keeping them in the STEM pipeline and increasing their participation in STEM careers.

Merle Froschl

FHI 360, New York, New York

Cheri Fancsali

Research Alliance for New York City Schools, NYU

Meghan Groome

Research Alliance for New York City Schools, NYU

Walter E. Washington Convention Center, 102 AB

321 TLC

Get the Picture: Connecting Young Children to Mathematics through Books

Pre-K-2 Session

Children's literature, thoughtfully selected and meaningfully shared, can provide rich contexts for mathematics learning. Preschool and kindergarten teachers, join us to learn how to integrate picture books with math. You'll leave with a list of our favorite titles, simple station ideas, and concept-building lessons that you can try out on Monday.

Eula Monroe

Emerita, Brigham Young University, Provo, Utah

Carrie Cutler

Univerity of Houston, Texas

Walter E. Washington Convention Center, 146 B

322

High School Math Talks 101: Getting Started

10-12 Session

Have you heard of high school math talks? Want to try them in your classroom? Come learn about this powerful tool to help your students share their math ideas and create a culture of math discourse. Hear advice and tips from teachers implementing math talks based on high school content. Bring your questions and curiosity to explore math talks.

Rayna Chatfield

Pocatello/Chubbuck School District No. 25, Idaho

Jason Libberton

Idaho State University, Pocatello

Walter E. Washington Convention Center, 140 AB

323 TLC

Intentionally Loosing Control: Fostering a Classroom Culture of Student Autonomy and Problem Solving

Pre-K-2 Session

In this session, we'll explore pedagogical moves and mathematical tasks that promote problem solving and help teachers create a classroom culture of student autonomy. By providing your students with the power to use what they know to make sense of what they don't know, they can become independent and confident young mathematicians.

Claire Riddell

Center for the Collaborative Classroom, Jacksonville, Florida Zachary Champagne

Zachary Champagne, Jacksonville, Florida

Walter E. Washington Convention Center, 203 AB













324 PROF

Learning Support for Title I Students: Teaching Mathematics

Coaches/Leaders/Teacher Educators Session

This session will provide research-based instructional practices that have proven to be effective with lowachieving Title I students in K-grade 12. Participants will be provided learning experiences that they will be able to use in developing effective practices for their low-performing students. A variety of instructional practices will be explored that cross over K-grade 12 and that are specifically targeted for English learners and cultural diverse student populations.

Gayle Pauley

National Title I Association, Fort Bragg, California **Kristi Coe**

OSPI, Olympia, Washington

Walter E. Washington Convention Center, 204 C

325 A&E

Let's Dispel the Myths about Women and Mathematics

General Interest Session

Now is the time to be aware of the myths surrounding women and mathematics and to address them in the classroom. Working for equitable treatment of all students as we debunk these myths requires gender-specific strategies such as types of questions, contexts of problems, makeup of small groups, and student-discourse oriented environment.

Lynn Columba

Lehigh University, Bethlehem, Pennsylvania

Lorraine Howard

Wilkes University, Wilkes-Barre, Pennsylvania

Walter E. Washington Convention Center, 146 C

326 CCC Making Connections That Count

8-10 Session

Making connections is central to learning. Building from prior knowledge to new ideas, connecting different representations of mathematical concepts, and mathematical domains is necessary to make sense of mathematics. What strategies, including dynamic interactive technology, can help bring structure and coherence to students' understanding?

Gail Burrill

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Michigan State University, East Lansing **Thomas Dick**

Oregon State University, Corvallis

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)

327 MODEL

Making the Most of the M in STEM— Mathematics, Modeling, and More

General Interest Session

All students need more STEM knowledge than ever, starting with quantitative reasoning and scientific thinking. And many students need to be prepared for STEM careers. K–12 mathematical modeling offers a rich opportunity to integrate math and STEM. Let's help every student learn to think, reason, and solve rich problems in math, STEM, and more.

Cathy Lynn Seeley

@cathyseeley

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Author/Speaker/Consultant, Austin, Texas

Walter E. Washington Convention Center, Ballroom B Reflection Cove following presentation.

328 MODEL

Modeling in a Liberal Arts Mathematics Course

General Interest Session

AMATYC's Crossroads and IMPACT, the MAA's Common Vision, SIAM's GAIMME, and other national reports recommend a greater attention to modeling in the mathematics classroom. Several modeling examples and activities appropriate for high school courses and courses in the first two years of college, particularly in the non-STEM pathway, will be shared.

James Ham

Delta College (AMATYC President), Midland, Michigan

Marriott Marquis, Liberty Ballroom N-P (Level M4)











329 TLC

Moving beyond a Plea for Productive Struggle

General Interest Session

The phrase productive struggle has held a place in math education for over ten years, earning a place in NCTM's Principles to Actions's recommended Mathematics Teaching Practices. But when asking students to productively struggle with rich mathematical tasks doesn't work—what do we do then? What can we do to support more equitable participation in these tasks?

Michael Reitemeyer

@mreitemeyer

Appoquinimink School District, Middletown, Delaware

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

330 TLC

Not Just Answering Someone Else's Questions: Making Math Class More Like Mathematics

General Interest Session

Mathematicians say mathematics is full of wonder, discovery, and curiosity. Most students use different words to describe it. I've studied the discipline of mathematics and the realities of math classes, seeking out colleagues who close the gap between the two. What can we learn from teachers whose students ask and answer their own math questions?

Tracy Zager

@tracyzager

Rollinsford Grade School, Portland, Maine

Walter E. Washington Convention Center, Ballroom A



Numbers and Nuance: Math in the News

8-10 Session

How can we use examples of mathematics from media, the Internet, and news organizations to foster discussion of current events in our math classrooms? How can these conversations increase student understanding of math concepts? And how can we use these conversations to teach our students to be more critical consumers of media and information?

Alex Fisher

@thatmaththing

The Blake School, Minneapolis, Minnesota

Walter E. Washington Convention Center, Salon I

332

Polynomial Division: Practices to Perfect

Engaging students to successfully divide polynomials is a challenge. This session provides examples and activities that build deep connections between whole number and polynomial arithmetic, counting in base 10 and base x, and models and methods for division. These practices will both challenge and delight your students.

Wendy DenBesten

@denbestenmath

Eureka Math, Washington, D.C.

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

333 A&E

Rethinking Equity: Rehumanizing Mathematics for Students Who Are Black, Indigenous, and Latinx

Coaches/Leaders/Teacher Educators Session

In this session, chapter authors in NCTM's Annual *Perspectives in Mathematics Education 2018:* Rehumanizing Mathematics for Black, Indigenous, and Latinx Students will showcase their efforts to ensure mathematics teaching and learning is a humane experience for students who historically have been marginalized in mathematics.

Melissa Boston

Duquesne University, Pittsburgh, Pennsylvania

Imani Goffney

University of Maryland, College Park

Rochelle Gutierrez

University of Maryland, College Park

Walter E. Washington Convention Center, 150 A













334 A&E

Teaching Social Justice via Two-Way Tables

6-8 Session

Harness math to tackle social justice! Participants will experience a project for eighth graders built around two-way tables (Common Core State Standard 8.SP.4) that explores homicide data and racial bias in capital punishment sentences. Participants discuss the promise and pitfalls of incorporating the topic of race into math class.

Jennifer McCormick

y@mrbilldc

Two Rivers Public Charter School, Washington, D.C.

Lawrence Chien

Two Rivers Public Charter School, Washington, D.C.

Mark Walth

Two Rivers Public Charter School, Washington, D.C.

Walter E. Washington Convention Center, 154 AB

335 TECH

Technology Can Transform Traditional Math Problems into Sense-Making Opportunities

8-10 Session

Traditional problems are typically assigned to provide students opportunities to practice a concept presented in class, or to assess their understanding. In this workshop, we will consider how technology tools like Google Docs, gMath, and Desmos can transform textbook exercises into interactive tasks to help student make sense of mathematics.

Victoria Miles

@MsMilesMath

Middleborough High School, Massachusetts

Shephali Chokshi

Mathematics Consultant, Uxbridge, Massachusetts

Walter E. Washington Convention Center, 151 A

336

Whole School Agreements: Avoiding Rules That Expire

General Interest Session

As students move from grade to grade, consistency in vocabulary, diagrams, manipulatives, and generalizations provides a common foundation from which to build new concepts and skills. This session focuses on ways in which schools can build a Whole School Agreement through a process engaging K–12 teachers and ideas that might be included in it.

Barbara Dougherty

University of Hawaii, Honolulu

Karen Karp

Johns Hopkins University, Baltimore, Maryland

Sarah Bush

University of Central Florida, Orlando

Walter E. Washington Convention Center, 147 B

337 TLC

Who's Asking the Questions in Math Class? Strategies for Inspiring & Cultivating Students' Curiosity

General Interest Session

Even though we want students to be curious about mathematics and how it applies in our world, most students and adults believe math class is a place where they're given answers to questions they've never asked. Learn strategies for inspiring students to ask their own questions and techniques for assessing curiosity in math classes at any grade level.

Timothy Hudson

y @DocHudsonMath

DreamBox Learning, Sammamish, Washington

Walter E. Washington Convention Center, Salon G











Your Professional Journey in Mathematics: The Five Secrets of Great Teachers!

General Interest Session

In this inspiring and engaging session, we dive into five factors of professionalism that allow you to leave a magnified heartprint on your students and colleagues. We examine factors of work life happiness, burnout avoidance, the inequities we cause, elements of effective risk taking, and the deep wisdom of becoming a feedback fanatic. Join us!

Timothy Kanold

y@tkanold

The Mathematics Center for Teaching and Learning , Chicago, Illinois Walter E. Washington Convention Center, Ballroom C

338.1 MODEL

Math Modeling from Contests to the Classroom

Reflection Cove following presentation.

10-12 Session

Learn more about engaging your student in Math Modeling through participation in modeling contests. A panel of teachers will discuss their experiences with preparing students for and participating in contests. We will share examples of problems and information about a new faculty mentoring initiative that supports classroom-focused math modeling.

Lauren Shareshian

Oregon Episcopal School, Portland

Cheryl Gann

North Carolina School of Science and Mathematics, Durham Greta Mills

Oxbridge Academy, West Palm Beach, Florida

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

338.2 **EW** TECH

Rate of Change: Algebra to Calculus

10-12 Exhibitor Workshop

What if you could help students see slope not as an equation to memorize, but as a representation of real events? Get out of your seats to model relationships between position and time using hands-on data collection. Learn some surprising things about teaching rate of change from algebra through calculus.

Texas Instruments

Dallas, Texas

Walter E. Washington Convention Center, 143 C

338.3 **EW** TLC

Engage Students, Teachers, and Administrators with Hands-On, RTI Solutions!

Coaches/Leaders/Teacher Educators Exhibitor Workshop

Experience how Moving with Math provides pre-K-high school RTI Solutions! Students are engaged in successful experiences that build their conceptual understanding through concrete-representational-abstract lessons. Teachers love the hands-on lessons, games, and journals that are easy to use. Administrators easily measure growth with embedded assessments.

Math Teachers Press, Inc.

Minneapolis, Minnesota

Walter E. Washington Convention Center, 159 AB

338.4 **EW** CCC

Effective and Practical Strategies to Implement Universal Math Intervention in the Core Classroom

General Interest Exhibitor Workshop

Engage with effective and practical strategies to implement universal math intervention to address diverse needs and make instruction accessible. Janet Pittock will discuss the use of flexible resources and adaptive software to support competency-based learning and empower teachers to address learning gaps that prevent on-level learning.

McGraw-Hill Education

Columbus, Ohio

Walter E. Washington Convention Center, 158 AB

338.5 **EW A&E**

Engaging All Learners Using Go Math

General Interest Exhibitor Workshop

Juli Dixon provides strategies for using GO Math! to engage each and every learner in K-grade 8. She emphasizes best practices for supporting all students to do the sense making, differentiating through questioning, and facilitating small group instruction.

Houghton Mifflin Harcourt

Austin, Texas

Walter E. Washington Convention Center, 156











A Technology-Enriched Introduction to Logarithms

10-12 Workshop

Any introduction to logarithms should begin with a study of exponential functions. Using a graphical approach featuring transformational geometry can lead to more engaging student exploration and deeper understanding. This hands-on workshop will use the TI-Nspire with its unique geometric/graphical capabilities to show how this can be accomplished.

Raymond Klein

Teachers Teaching with Technology, Glen Ellyn, Illinois Marriott Marquis, Capitol/Congress (Level M4)

Applying the Five Practices to Visual **Patterns**

6-8 Workshop

In this session, we'll explore a rich context for making connections between multiple representations: visual patterns. Using Smith and Stein's Five Practices as a guide, we'll discuss best practices for facilitating classroom discussions around visual patterns, with special attention given to selecting, sequencing, and connecting student work.

Michael Fenton

@mjfenton

Desmos, Fresno, California

Walter E. Washington Convention Center, 207 B

TLC

Developing Mathematical Fluency: What Is It? and How Do We Create Systems to Support It?

3-5 Workshop

Deepen your understanding about what fluency is and how to best support it. Explore an approach for developing and assessing fluency that reflects the depth and goals of the CCSSM. Learn how using the three phases of mastering basic facts can increase your understanding of student thinking and empower you in designing next steps for instruction.

Christine Roberts

@mathschristine

Tulare County Office of Education, Visalia, California

Walter E. Washington Convention Center, 207 A

342

Engage Your Students in Probability with Secret Spinners and Bear Wrestling

6-8 Workshop

Collecting data is key to approximating unknowable probabilities. We'll learn to play a Secret Spinner game and then generate data using a tabletop Bear Wrestling toy in which colliding bears land in one of five possible positions. Let's develop, use, and evaluate probability models in classroom-tested ways that will engage middle school students!

David Kennedy

Shippensburg University of Pennsylvania

Walter E. Washington Convention Center, 209 ABC

343 ISSUES

Financial Literacy: Early Investment in Skills and Concepts at the Primary Level

Pre-K-2 Workshop

Financial literacy is an important life skill, yet how are we fostering understanding in our youngest students? This workshop will give participants the opportunity to engage in tasks that help build a foundation for financial literacy in the primary classroom. Learn what material and manipulatives are available to support our littlest consumers.

Lindsay Gold

@lindsayanngold

University of Dayton, Ohio

Michael Houston

Riverside Beaver County School District, Ellwood City,

Pennsylvania

John Ashurst

Riverside Beaver County School District, Ellwood City, Pennsylvania

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)











Find Hidden Gems in Assessments and Discussions by Making Every **Interaction a Formative Opportunity**

10-12 Workshop

Using classroom scenarios and data, we'll discuss possible instructional responses to planned formative checks. Unplanned information from the same class will also be investigated as a powerful but often overlooked source of information. We will discuss various collaborative grouping arrangements, monitored direct instruction, and differentiation.

Allan Bellman

@abellman17

University of Mississippi, Oxford

Kayton Hosket

University of Mississippi, Oxford

Walter E. Washington Convention Center, 201



Give Lift to Your Math Class Using **Aviation Concepts!**

6-8 Workshop

Have you ever flown in a small plane? Ever wonder how pilots use mathematical concepts in flying? In this session, participants will learn and work together to plan and "fly" a cross-country flight using pilot tools, sectional charts, vectors, ratios and proportions, and much more! Come and get ready to take off!

Cindy Hasselbring

@chasselbring321

Aircraft Owners and Pilots Association, Frederick, Maryland

Walter E. Washington Convention Center, 143 AB

Hanging Math on a Clothesline!

8-10 Workshop

Clothesline is an adjustable number line to develop number sense. Come join us in hands-on Clothesline activities that promote mathematical reasoning and debate. Together we will explore an understanding of variables, algebraic expressions, geometric relationships, and equations. You will leave ready to implement activities tomorrow in your class!

Chellie Thames-Schwantes

Ridgeland High School, Mississippi

Rebecca Hurst

Olde Town Middle School, Ridgeland, Mississippi

Marriott Marguis, Marguis Ballroom Salon 4 (Level M2)

347 TECH

Interactive Early Algebra Puzzles for Young Learners: Free Web-Based **Activities for Your Classroom**

3-5 Workshop

Come explore a collection of puzzles that engage students in grade 3 and up in early algebraic reasoning. Through students' natural logic, they develop foundational algebraic habits of mind while exploring the puzzles. We'll watch interviews of students' solving and creating their own puzzles and discuss their thinking. Bring a laptop or tablet.

Daniel Scher

@dscher

McGraw-Hill Education, New York, New York

Antonia Cameron

Metamorphosis Teaching Learning Community, New York, New York

Stephanie Slabic

Metamorphosis Teaching Learning Community, New York, New York

Marriott Marquis, Independence Ballroom E (Level M4)





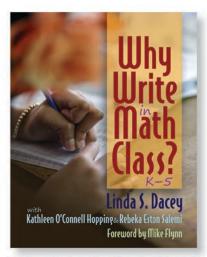






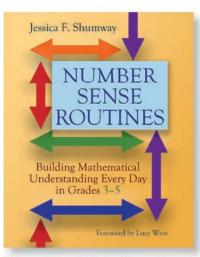


New Resources for Deepening Your Students' Mathematical Thinking



Why Write in Math Class?

Linda Dacey with Kathleen O'Connell Hopping and Rebeka Eston Salemi Foreword by Mike Flynn



Number Sense Routines Building Mathematical Understanding Every Day in Grades 3–5

Jessica F. Shumway Foreword by Lucy West





Visit us at booth 153!

For a list of Stenhouse authors holding mini-sessions at the booth, visit **sten.pub/minisessions**

Christopher Danielson

COMING LATER IN 2018:

Choral Counting & Counting Collections: Transforming the Pre-K-5 Math Classroom Edited by Megan L. Franke, Elham Kazemi, and Angela Chan Turrou

A paperback version of Adding Talk to the Equation:

A Self-Study Guide for Teachers and Coaches for Improving Math Discussions
Lucy West

FREE SHIPPING ON ALL ORDERS, NO CODE, NO MINIMUM

Free shipping in the U.S. only.



Christopher Danielson

348 PROF

It's Time To Roll Up Our Sleeves and Dive Deep into the Math We Want Our Students to Do

Coaches/Leaders/Teacher Educators Workshop

Nothing may be as powerful in strengthening instructional practice as developing a common practice of teachers doing math together. Join this interactive workshop to experience a detailed protocol for analyzing tasks and student work samples. Leave with concrete next steps for incorporating "doing math" into your professional learning setting.

Barbara Beske

★@beske3

Student Achievement Partners, Mullica Hill, New Jersey

Walter E. Washington Convention Center, Salon H

349 MODEL

Making Sense of the World through **Mathematics, and of Mathematics** through the World

10-12 Workshop

Mathematical modeling highlights the relevance of mathematics. Explore components of authentic modeling tasks used to demonstrate the importance and range of mathematics. Engage in tasks designed to enrich your knowledge of secondary mathematics concepts. Examine the math modeling process and how it can be used to help students make sense of math.

Aline Abassian

@AlineAbassian

University of Central Florida, Orlando

Farshid Safi

University of Central Florida, Orlando

Walter E. Washington Convention Center, 150 B

350 TLC

Marshmallow Measurement: Exploring Length with Non-standard and Standard Units

Pre-K-2 Workshop

Engage students in meaningful measurement activities that focus on identifying attributes of objects, unit iteration, different-size units, and comparing lengths. See how to use purposeful questions with these activities that promote student sense making. Come ready to play and learn!

Virginia Lewis

@lewisvv

Longwood University, Farmville, Virginia

Leah Shilling

Longwood University, Farmville, Virginia

Maria Timmerman

Longwood University, Farmville, Virginia

Marriott Marquis, Independence Ballroom A-C (Level M4)

351 TLC

Mathematical Circuit Training—Engage **Every Student!**

8-10 Workshop

Do you wish you could engage all of your students for the entire class period? Come to this session to learn about circuit training. Participants will not only work several circuits but will also learn how to write a series of exercises for their students in this engaging, scavenger-like format.

Virginia Cornelius

@virgecornelius

Lafayette County School District, Oxford, Mississippi

Walter E. Washington Convention Center, 206











352 NEW T

New Teacher Strand: Conceptual vs. Procedural Understanding: Empowering All Students through Concept Development

Pre-K-5 Workshop

Many teachers, new and experienced, see math as a set of procedures. They teach students the steps to solve problems while paying little attention to the beauty and creativity of mathematical concepts. Learn how engaging students in building their understanding reaches all students, improves their learning, and has them leaving liking math!

Judy Rodgers

Loudoun County Public Schools, Ashburn, Virginia Shirley Fortenbaugh

Loudoun County Public Schools, Ashburn, Virginia

Walter E. Washington Convention Center, 204 AB

353 ISSUES

PD & Instructional Tools for Advancing ELLs' Mathematics and Language through an Integration Approach

Coaches/Leaders/Teacher Educators Workshop

This workshop includes activities from a yearlong focus group for mainstream and ESOL teachers working towards developing ELLs' mathematics and language skills. Participants will learn about PD structures guided by WIDA LD Standards and explore instructional tools for language-mathematics integration to make mathematics accessible for ELLs.

Galina (Halla) Jmourko

y @HallaJmourko

Prince George's County Public Schools, Adelphi, Maryland Rodrigo Gutierrez

University of Maryland, College Park

Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)

354 TLC

Planting the Seeds in Algebra 2 and Precalculus That Support Ideas in Calculus

10-12 Workshop

Explore activities that can be used in an algebra 2 and precalculus that lay the foundation for strong conceptual understanding in calculus. Experience how paper ripping and the spread of disease supports infinite series and logistic growth. At first the activities give students an "aha" moment and later in calculus provide a point of reference.

Lysa Rieger

Wallingford Swarthmore School District, Pennsylvania Andrew Benzing

Wallingford Swarthmore School District, Pennsylvania

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

355 A&E

Removing Barriers to STEM Success by Developing 3-D Spatial Skills

6-8 Workshop

The ability to visualize in three dimensions is a cognitive skill that has been shown to be important for success in mathematics and other STEM fields. In this workshop, participants will interact with a curriculum designed to rapidly develop spatial skills with a view to improving math performance in girls, who tend to benefit from instruction.

Jason Power

₩@power ul

Michigan Technological University, Houghton

Martha Carr

University of Georgia, Athens

Kinnari Atit

University of Georgia, Athens

Walter E. Washington Convention Center, 151 B











356 TLC

Seven Billion People on Earth! A Task for Fostering Productive Struggle

6-8 Workshop

Come learn how a cognitively demanding real-world task such as the Seven Billion People Problem can promote productive struggle and help shape students' mathematical dispositions. Participants will explore the challenges of solving, choosing, and implementing worthwhile tasks, and engage in extensions to social studies, literacy, and music.

Jaclyn Murawska

y @murawskamath

Saint Xavier University, Chicago, Illinois

Walter E. Washington Convention Center, 101

357 TLC

Supporting Early Mathematics through Children's Literature

Pre-K-2 Workshop

Research shows early math as the greatest predictor of future success in both reading and math because of the focus on reasoning and sense making. Children's literature is a powerful tool to engage students in activities to support early math. Come explore literature with a mathematical lens as a means to foster joy and wonder for math and literacy.

Allison Hintz

@allisonhintz124

University of Washington, Seattle

Kristin Gray

Illustrative Mathematics, Lewes, Delaware

Erin Gannon

Illustrative Mathematics, Lewes, Delaware

Walter E. Washington Convention Center, 202 B

358 TLC

Take Number Talks to the Next Level with Purposeful Talk Moves

Pre-K-2 Workshop

Many students seem to lose number sense as they learn algorithms. Number talks encourage students to think flexibly and develop strategies that help them build number sense. Purposeful talk moves can take number talks to a higher level by helping students effectively communicate their reasoning as they share their strategies.

Angela Baker

Chesterfield County Public Schools, Virginia
Joy Leath

Chesterfield County Public Schools, Virginia

Walter E. Washington Convention Center, 147 A

359 A&E

Transform a Worksheet to Build Equity and Engagement in the Classroom with Desmos Activity Builder

8-10 Workshop

Participants will use Desmos Activity Builder to transform a static worksheet into an interactive activity to promote an authentic integration of the Mathematical Practice Standards into the classroom. We will emphasize teaching methods to create a more equitable classroom experience while developing positive mathematical mindsets in students.

Jade White

@jademohrwhite

Grossmont Union High School District, San Diego, California **Linda Saeta**

Claremont Unified School District, California

Walter E. Washington Convention Center, 152 B



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360 TECH

Transformational Geometry In 15 Seconds or Fewer: Immediate Interactive Investigations in Grades 8–11

8-10 Workshop

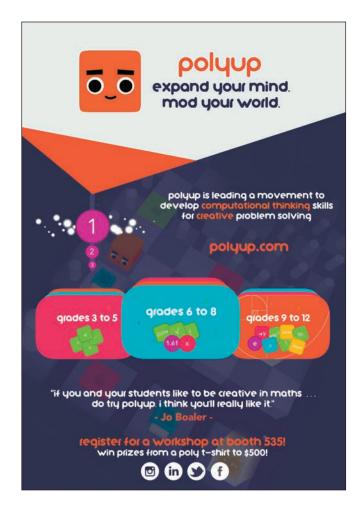
Get hands-on experience: Play-Investigate-Explore—discover the geometric properties in 15 seconds! Using a handheld, iPad, or software, students will become engaged quickly. And deeply. Get all 30 free activities and student/teacher materials. Learn how to implement. Integrate creative exploration and pedagogy through technology and collaboration.

Tom Reardon

y@tomreardon3

Consultant, Poland, Ohio

Walter E. Washington Convention Center, 144 ABC





Using Coffee Stirrers to Develop Reasoning about Geometric Shapes and Their Attributes

3-5 Workshop

Get ready to experience hands-on activities using coffee stirrers and chenille sticks to develop reasoning about two- and three-dimensional shapes and their attributes by making and testing conjectures. Attendees will receive literature selections, apps, and other resources that will enhance development of the concepts presented within the handout.

Carolyn White

y@Rusmpk6

Rice University, Houston, Texas

Susan Troutman

Rice University, Houston, Texas

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

362 TLC

Using Visual Representations: Engaging All Students with the Standards for Mathematical Practice

6-8 Workshop

Using diagrams, dynamic tools, and gestures engages students in mathematical practices. Students' visual representations of mathematical ideas are critical in clarifying their understanding, communicating their thoughts, and empowering them as learners. Come engage in middle grades activities that use and evoke multiple visual representations. BYOD.

Harriette Stevens

Mathematics Education Group, San Francisco, California

Hee-Joon Kim

Center for Technology in Learning, SRI International, Menlo Park, California

Marriott Marquis, Liberty Ballroom I-K (Level M4)











363 TLC

Walk a Number Line with Elapsed Time, Rounding, Fractions, Factoring, and Making Change

3-5 Workshop

Are you looking for some great ideas to use with number lines? You will experience unique problems and games and be amazed how you can immediately use them to deepen student understanding of concepts such as making change, elapsed time, rounding, factoring, and fractions.

Ruth Harbin Miles

Mary Baldwin University, Madison, Virginia

Kim Sutton

Creative Mathematics, Arcata, California

Walter E. Washington Convention Center, 103 A

364 A&E

What's in a Name? Using Contextual-Based Story Problems In Mathematics Instruction

3-5 Workshop

Contextual-based story problems are recommended as means to help students understand the mathematics content that we teach. But what are contextual-based story problems? This presentation will provide a deeper understanding of contextual-based story problems and ways to incorporate them into mathematics instruction beyond utilizing students' names.

Lakesia Dupree

University of South Florida, Tampa

Maria Becht

University of South Florida, Tampa

Walter E. Washington Convention Center, 149 AB

11:00 A.M.-12:00 P.M.

365 A&E

Achieving Excellence, Equity & Inclusion in Mathematics Using a Social Justice Curriculum Approach

General Interest Session

Learn how not to simply "mathematize" the context, but how to empower students with self-love, knowledge, and respect as they seriously deliberate cause/effect and solutions through the use of mathematical models such as economics and statistical analysis to dissect historical and contemporary societal issues and their ramifications.

Beatrice Moore-Luchin

@BeaLuchin

Benjamin Banneker Association, Inc., Houston, Texas

Marriott Marquis, Liberty Ballroom N-P (Level M4)

366 TLC

Addressing Numeracy with the Struggling Learner

Pre-K-2 Session

How do we begin supporting numeracy development? This session focuses on how students learn to compose and decompose whole numbers. We will view student video and discuss how to nudge their thinking towards fluent ways of computing, while focusing on gate-keeping concepts that hold students back.

Paula Muehler

Math Learning Center, Sussex, Wisconsin

Walter E. Washington Convention Center, 146 B

367 TECH

APPlied Mathematics: The Logic, Algebra, and Geometry of Mobile App Design

8-10 Session

After completing a yearlong pilot of the Mobile Computer Science Principles program, I will share student work and the instructional strategies that were most effective to help students ranging from prealgebra to calculus levels create functional mobile apps. Particular focus will be placed on the power of visualization.

Amy Bigelow

Franklin Academy, East Haddam, Connecticut

Walter E. Washington Convention Center, Salon C











Authentically and Meaningfully Integrating the "M" in STEAM: The **Mathematics Matters!**

3-5 Session

We share four concrete examples of classroom-tested inquiries that meaningfully integrate all areas of STEAM: designing a prosthetic arm for a kindergartner, a paleontology investigation, roller-coaster engineering, and creating a coat for a giant! Our discussion will focus on specific alignment to grades 3–5 CCSSM content and practices.

Sarah Bush

@sarahbbush

University of Central Florida, Orlando

Kristin Cook

Bellarmine University, Louisville, Kentucky

Richard Cox

Bellarmine University, Louisville, Kentucky

Walter E. Washington Convention Center, 152 A

369 MODEL

Baby Steps to PBL Success: Lessons from Teachers Implementing PBL

10-12 Session

Project-based learning can be a way for students to learn rigorous mathematics while engaged in authentic, relevant challenges. Learn how to transition from problem-based to project-based learning. We share lessons learned from teachers trying to implement PBL for the first time and design ideas and resources for you to implement your own projects.

Enrique Galindo

Indiana University, Bloomington

Jean Lee

University of Indianapolis, Indiana

Walter E. Washington Convention Center, 147 B

Choice Matters! Using Menus to Reach All Students during Math Workshop

General Interest Session

Looking for ways to provide more student choice while operating in the Math Workshop model? Choice Menus are the way to go! During this session, participants will be introduced to a variety of choice menus aimed at meeting the needs of all your students. Join me to learn more and walk away with samples you can take back to your classroom!

Meghan Alcorn

@AlcornMeghan

Sulphur Springs ISD, Pickton, Texas

Walter E. Washington Convention Center, Salon G

371 TECH

Congruence, Similarity, and Proof: Experience a Hands-On Transformation Approach Using Web Sketchpad

8-10 Session

CCSS promotes a transformation approach to congruence. Learn how to actively engage students in using transformations to prove SAS, SSS, ASA, and other important theorems. With freely available online activities, students construct, visualize, compose, and manipulate transformations; create proofs; and solve problems of congruence and similarity.

Scott Steketee

21st Century Partnership for STEM Education, Philadelphia, Pennsylvania

Wavne Nirode

Miami University, Troy, Ohio

Donovan Hayes

Building 21, Troy, Ohio

Marriott Marquis, Independence Ballroom D (Level M4)











20 Tools for Digital Schools!

6-8 Session

20 Tools for Digital Schools will provide participants the opportunity to explore free, online resources for the classroom. During this session, the presenters will provided a quick synapses of each resource and give some examples of how these can best be implemented in the classroom.

Kelly Barr

Glenville, West Virginia

Traci DeWall

Glenville, West Virginia

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

373 A&E

Empowering Equity with Collaborative Problem Solving

3-5 Session

Research indicates that minority students can compete with and outperform peers if given the opportunity to talk through math problems. Participate in a student-centered paradigm that embraces the *Principles to Actions* document as it employs student discourse to understand the problem, compare solution plans, make sense of results, and self-evaluate.

Robyn Silbey

Robyn Silbey Professional Development, Gaithersburg, Maryland
Walter E. Washington Convention Center, 154 AB

374 TLC

Engaging Students in Seeing Mathematical Structure

8-10 Session

Students who identify mathematical structure find and use efficient strategies to solve problems. How can we helps students see the structure of mathematical concepts before we name it for them? Practical strategies that engage students in noticing structure will be modeled with specific details for implementation in the secondary classroom.

Sara Van Der Werf

@saravdwerf

South High School, Minneapolis, Minnesota

Walter E. Washington Convention Center, 145 AB

Reflection Cove following presentation.

375 MODEL

Enriching Word Problems with a Mathematical Modeling Framework

10-12 Session

Have you ever been frustrated by the overabundance of contrived word problems? This session will focus on converting conventional word problems into authentic opportunities for mathematical modeling. Attendees will learn about a framework of the mathematical modeling cycle and experience a modeling task created with the framework.

Samuel Otten

©MizzouMathEd
University of Missouri, Columbia
Wenmin Zhao
University of Missouri, Columbia
Cara Haines

University of Missouri, Columbia

Walter E. Washington Convention Center, 202 A

376 CCC

Expressions and Equations: Growing through Middle School

6-8 Session

Experience how expressions and equations grow through the middle school grades. Build a toolkit of sense-making equation-solving strategies that involve mental math and manipulatives. Experience activities suitable for practice, group work, or formative assessment that will engage students.

Cynthia Raff

Center for Mathematics and Teaching, Pasadena, California Shelley Kriegler

Center for Mathematics and Teaching, Los Angeles, California

Marriott Marquis, Liberty Ballroom M (Level M4)











377 ASSESS

Formative Assessment: Brought to You by the Number 5

General Interest Session

Mix the 5 Practices (Smith and Stein), the Formative 5, and 5 of NCTM's Effective Mathematical Teaching Practices and you have the perfect recipe for an exceptional formative assessment experience that will guide your planning, enhance your instruction, drive student discussions, and ultimately improve student understanding. Come experience this with us!

Jonathan Wray

y@jonathanwray

Howard County Public Schools, Ellicott City, Maryland

Walter E. Washington Convention Center, Ballroom C Reflection Cove following presentation.

378 CCC

From Sequences to Function Families: Ideas for Creating a Coherent and Connected Algebra Curriculum

8-10 Session

We'll explore a sequences approach to function families. By reasoning visually with figural sequences, all students can discover connections between arithmetic/geometric sequences and linear/exponential function families. We also discuss ways to develop recursive and co-variational thinking and ability to generalize recursive and explicit formulas.

Barbara Kinach

Arizona State University, Mesa

Walter E. Washington Convention Center, 204 C



379 A&E
Iris Carl Address: Taking
a Knee in Mathematics
Education—Moving
from Equity Discourse to
Protest and Refusal

General Interest Session

I offer some thoughts on why equity-oriented discourse and practice are necessary but not sufficient responses to oppression and dehumanization in mathematics education. In various ways, equity-oriented reforms have maintained the status quo. I offer some additional thoughts on protest and refusal in mathematics education.

Danny Bernard Martin is Professor of Education and Mathematics at the University of Illinois at Chicago (UIC), where he has been a faculty member since 2004. His research has focused on understanding the salience of race and identity in Black learners' mathematical experiences. He is the author of the book Mathematics Success and Failure Among African Youth, editor of Mathematics Teaching, Learning, and Liberation in the Lives of Black Children, co-editor of The Brilliance of Black Children in Mathematics: Beyond the Numbers and Toward New Discourse, and co-author of The Impact of Identity in K–8 Mathematics Learning and Teaching.

Danny Bernard Martin

University of Illinois at Chicago

Walter E. Washington Convention Center, Ballroom B

380 TLC

Learning to Listen through Rich Mathematical Tasks

Pre-K-2 Session

Listening is one of the most important tools in a teacher's toolbox. In this session, we'll explore a variety of rich mathematical tasks that provide authentic opportunities for us to learn to better listen to our students. We'll also view video clips of students solving problems as an exercise in learning to truly listen.

Zachary Champagne

y@zakchamp

Zachary Champagne, Jacksonville, Florida

Walter E. Washington Convention Center, 146 C











381 ASSESS

Mathematical Modeling as a Preassessment Tool

10-12 Session

This session will share about how a high school teacher uses mathematical modeling as a preassessment of students' content knowledge, mathematical dispositions, and motivation. Through mathematical modeling, teachers not only engage students in learning, but can also learn about the backgrounds of their students.

Rachael Gorsuch

y@rachaelhgorsuch

Columbus Academy, Gahanna, Ohio

Walter E. Washington Convention Center, 150 A

382 MODEL

Mathematical Modeling: Using Authentic Problem-Solving Tasks to Interpret the World around You

6-8 Session

Inclusion of mathematical modeling tasks in the classroom increases student engagement, conceptual understanding, and autonomy. Participants will investigate the characteristics of a rich modeling task and will practice transforming traditional textbook problems into open-ended tasks that encourage critical thinking and reasoning for all learners.

Nancy Butler Wolf

y@drnanbut

University of California, Riverside

Alexis Wolf-Diaz

Azusa Unified School District, California

Walter E. Washington Convention Center, Salon I



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Mathematizing My World: Mathematical Modeling for Young Children

Pre-K-2 Session

Modeling helps young children unlock the math embedded in their daily experiences. But what are effective mathematical models for early childhood? This session introduces effective models and explores how teachers can support children's understanding of mathematics during direct instruction, open-ended problem solving, and play.

Kate Austin

@kaustin320

Great Minds, Reston, Virginia

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

384

TLC

Measuring Student Mathematical Thinking

8-10 Session

This session explores what mathematical thinking is and what it looks like in the classroom. Participants will use a reflection tool to analyze student data/evidence in a video and their own practice. We will discuss facilitating mathematical discourse (NCTM 2014) and instructional implications around MP 3, 7, and 8.

Katie Laskasky

Loyola Marymount University, Los Angeles, California Tatiana Mirzaian

Loyola Marymount University, Los Angeles, California **Kathy Clemmer**

Loyola Marymount University/El Segundo Unified School District, Los Angeles, California

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)



Moving for Math: Engaging the Brain through Regular Classroom Movement

3-5 Session

Physical activity and movement in the classroom offer many benefits to children, including improved learning and increased motivation. This session highlights how teachers can integrate regular movement during math instruction to get students excited and engaged in learning. Come and discover how you can get students moving for math.

Mercedes Tichenor

Stetson University, Deland, Florida

Kathy Piechura-Couture

Stetson University, Deland, Florida

Elizabeth Heins

Stetson University, Deland, Florida

Marriott Marquis, Liberty Ballroom L (Level M4)



Performance Tasks as a Evidence of Student Learning

Pre-K-2 Session

A performance task is any learning activity that asks students to perform to demonstrate their knowledge, understanding, and proficiency. These tasks provide opportunities for students to apply their learning in context. We will review examples of performance tasks from K-2 classrooms and explore how teachers can use them to guide instruction.

Jill Rubinstein

@lifeofjill

Eagle County Schools, Colorado

Walter E. Washington Convention Center, 203 AB











PLC: Purposely Leveraging Community—Good to Great Is Not a Solo Climb!

General Interest Session

One hallmark of professions is the role of community in defining and facilitating excellence in the work of the discipline. Explore ways to identify colleagues, extend networks, and join and/or craft productive participation/collaboration structures to accelerate your trajectory in all aspects of highly accomplished practice as a mathematics educator.

Margaret Cagle

@pegcagle

Reseda High School/LAUSD, Woodland Hills, California

Walter E. Washington Convention Center, Ballroom A Reflection Cove following presentation.



Quadratic Functions: Rethinking Factored Form and the Leading Coefficient

8-10 Session

This session takes a graphical approach to rethink features of quadratic functions. Many people use factored form to identify x-intercepts but we explore how it can reveal lines that determine all the points of a parabola. People also describe how the leading coefficient affects a parabola's width but we investigate why this is not the whole story.

Zandra de Araujo

University of Missouri, Columbia

Samuel Otten

University of Missouri, Columbia

Sheunghyun Yeo

University of Missouri, Columbia

Marriott Marguis, Independence Ballroom F-H (Level M4)

389



Solving the Mathematics Teacher Shortage: Retention Strategies

Research Session

This interactive session will highlight the results of a recent, national survey of early-career secondary mathematics teachers about the professional support they receive, the professional learning activities in which they engage, other factors that affect their effectiveness and growth, and their interest and likelihood in continuing to teach.

James Martinez

@dolphinprof

California State University, Camarillo

Walter E. Washington Convention Center, 102 AB

390

Supporting Girls' Mathematics Learning **Using High-Interest Texts**

3-5 Session

Girls tend to prefer mathematics tasks that have realworld value, as well as particular topics that have been shown to engage them. In this session, participants will gain strategies and classroom ideas for supporting girls' mathematics learning through high-interest texts that serve their learning preferences.

Lynda Wiest

University of Nevada, Reno

Heather Crawford-Ferre

Nevada Department of Education, Carson City

Walter E. Washington Convention Center, 146 A

391 A&E

Teacher Noticing in Linguistically Diverse Secondary Mathematics Classrooms

6-8 Session

This session will look at episodes of teacher noticing captured in linguistically diverse middle school mathematics classrooms. Teacher noticing, a set of three interrelating skills, is a valuable formative assessment tool. Teacher noticing can be used to positively position emerging bilinguals as important contributors in the classroom.

Rachel Bower

Texas State University, San Marcos

Walter E. Washington Convention Center, 151 A













392 TLC

The Hero's Journey: Rethinking the **Design of Math Lessons**

General Interest Session

Why are some math lessons more memorable and engaging than others? We'll offer insight on this question from a cognitive science perspective, and we'll consider ingredients that have successfully engaged people for millennia and that are found in stories. We'll showcase how the architecture of stories can be utilized to make for powerful classroom experiences.

Zachary Miller

¥@zmill415

Summit Public Schools, San Francisco, California

Cameron Yuen-Shore

The Brandeis School, San Francisco, California

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)



The Roof Is on Fire: Rescuing Math Reform and Making It "Relevant" in **Black Communities**

Coaches/Leaders/Teacher Educators Session

For real impact in mathematics for black communities, we must redesign math reform practice in public education. Four persistent conditions in mathematics reform must be actively dismantled and replaced with the promise and power of authentic local movements of change which are rooted in social fabric of black communities.

Lou Matthews

@blakskolar

Bermuda Public Schools, St David's

Walter E. Washington Convention Center, 140 AB



Using Double Number Lines to Solve Ratio/Proportion Problems

6-8 Session

Double number lines are a visual tool that represent the comparison of two quantities. We will examine and illustrate how double number lines can be used to develop and support conceptual understanding of rates, unit rates, and percent. The visual solutions will be compared to traditional methods to illuminate the usefulness of this tool.

Connie Laughlin

Eureka Math, Muskego, Wisconsin

Walter E. Washington Convention Center, 103 B



Driving On Mars: A Coding Problem

10-12 Exhibitor Workshop

Have your students wondered how driverless cars work? Have you considered the math that it takes for vehicles to drive on Mars? In this session, we will code robotic vehicles using mathematics to drive, make turns and complete a challenge. Best part: no coding experience needed!

Texas Instruments

Dallas, Texas

Walter E. Washington Convention Center, 143 C

394.2 **EW** MODEL



Advanced Algebra With Financial Applications: The Perfect 3rd/4th Year Math Course For All Students

10-12 Exhibitor Workshop

Hear authors Rob Gerver and Rich Sgroi speak about the new 2nd Edition of Financial Algebra. Topics from Algebra 2, Trig, Stats, Precalculus, Probability, and Geometry are used to explore banking, credit, taxes, investing, mortgages, budgeting, and more, all with only an Algebra 1 prerequisite. A copy of the book will be given to all attendees.

National Geographic Learning / Cengage Learning Boston, Massachusetts

Walter E. Washington Convention Center, 159 AB

394.3 **EW** TLC





Three Lessons Learned from 25 Years of **Number Talks**

General Interest Exhibitor Workshop

Number Talks is a change agent for shifting the culture and pedagogy of the mathematics classroom. This session presents suggestions when facilitating Number Talks to develop student numerical reasoning and proficiency, highlight important mathematics when scribing, and empower students to be inventors of mathematical ideas.

Houghton Mifflin Harcourt

Austin, Texas

Walter E. Washington Convention Center, 156











BYOD: Mathspace—Why You'll Never Grade Math Assignments Again. Seriously.

General Interest Exhibitor Workshop

Meet Mathspace. You've seen it all, right? Adaptive learning? Yep. Handwriting recognition? Hmm. Every math question graded line-by-line? Whoa, that's new! Students can finally show their work, and get feedback at every step—all auto-graded for you. Bye-bye, multiple choice! BYOD to try the award-winning Mathspace live, and ask about a free trial

Mathspace

New York, New York

Walter E. Washington Convention Center, 158 AB

11:30 A.M.-12:00 P.M.

395 ASSESS

A Lesson Plan Format Designed to Help Student Teachers Navigate the Requirements of the edTPA

Coaches/Leaders/Teacher Educators Burst

The edTPA is a high-stakes performance assessment for student teachers. After becoming a national edTPA scorer and creating an edTPA sample, I designed a lesson plan format to help student teachers plan for and navigate all of the requirements of the edTPA. In this talk, I will present and teach participants how to use this lesson plan template.

Becky Hall

Western Connecticut State University, Danbury

Walter E. Washington Convention Center, 149 AB

396 TLC

Change How You Present Problems and Question Students to Increase Engagement and Access

8-10 Burst

Do your students check out when you assign a problem? Are you questioning for learning, or just for an answer? Who is talking in your classroom and why? Learn how to change traditional problems into accessible, engaging tasks for all students and how to foster discourse that builds conceptual understanding.

Bryan Anderson

❤️@Anderson02B

First City School, Bemidji, Minnesota

Walter E. Washington Convention Center, 206

397 A&E

Court Is in Session: Geometry with Its Postulates Go to Court

10-12 Burst

Grab your robe and gavel. This lesson creates an analogy between geometry axioms and theorems and the legal system. Students act as the defense, prosecution, or jury, creating a basis of laws and decisions. Using logical thinking, citing "laws," and responding to arguments, students must prove their case while noting "legal" precedence.

Catherine Medina-DeVilliers

T.C. Williams High School, Alexandria, Virginia

Walter E. Washington Convention Center, 207 B















Friday, April 27, 6:00 - 7:00 p.m., Cash Bar Walter E. Washington Convention Center, Ballroom B

Ignite! We'll Enlighten You, and We'll Make It Quick

Hear from eight mathematics educators as they describe the teacher/teaching/educator moment that significantly impacted them. The challenge is that each speaker will get five minutes to talk, using twenty slides that auto advance every fifteen seconds, whether they're ready or not. Matt Larson will emcee this exciting event!



Matt Larson, Emcee President, National Council of Teachers of Mathematics, Reston, Virginia; Lincoln Public Schools, Nebraska



Laila Nur LAUSD, Los Angeles, California



Timothy Kanold Loyola University Chicago, Illinois



Greg Tang GregTangMath.com Belmont, Massachusetts



Robert Berry, III President-Elect, National Council of Teachers of Mathematics, Reston, Virginia; University of Virginia, Charlottesville



Diane Briars Past President, National Council of Teachers of Mathematics. Reston, Virginia; Consultant, Pittsburgh, Pennsylvania



Juli Dixon University of Central Florida, Orlando



Lucy West Metamorphosis Teaching Learning Communities, New York, New York



Paul Kelley Anoka High School, Anoka, Minnesota







Early Numeracy Partnerships: Exploring **Professional Development to Enhance Early Numeracy**

Pre-K-2 Burst

This session will focus on the design and implementation of a professional development series to improve mathematics instruction in early learning. Learn how teachers have worked to purposefully plan for rich mathematical experience and capitalize on the mathematical opportunities that routinely take place in early learning classrooms.

Stephanie Power

@StephanieHPower

Genesis Early Learning, Edmonton Catholic Schools, Alberta, Canada

Amy Swinkels

Genesis Early Learning, Edmonton Catholic Schools, Alberta,

Lynn McGarvey

Genesis Early Learning, Edmonton Catholic Schools, Alberta, Canada

Walter E. Washington Convention Center, 147 A

399 ASSESS

Empowering Learners through Formative Assessment

6-8 Burst

Do you want to be sure that your students are benefiting from instruction? Formative assessment tools empower teachers to know their students' understanding of math concepts during instruction. This fast-paced presentation will provide teachers with tools and practices that provide a clear overview of learning throughout lessons and units.

Jessica Talada

Liberty University, Lynchburg, Virginia

Walter E. Washington Convention Center, Salon H

400 ASSESS

Empowering Students to Self-Reflect and Set Goals in the Math Classroom

Coaches/Leaders/Teacher Educators Burst

Student reflection in the math classroom can be a powerful tool. When handing back graded assignments, some students tend to shove their paper into their desk and it's never seen again. I'd like to end this cycle by empowering students to reflect on their progress, analyze math concepts, set goals, and monitor their own mathematical thinking.

Matt Coaty

@mcoaty

CUSD 95, Hawthorn Woods, Illinois

Marriott Marquis, Liberty Ballroom I-K (Level M4)

401

Equity in Mathematics Teaching: A Lesson Plan for Fifth-Grade Classrooms

3-5 Burst

Once during the semester, each group of students will use a social justice reading as the basis for a mathematics activity. One may either use mathematics to teach and learn about the issues of social, political, and economic justice from the reading or conversely or use such social justice issues as the context to learn mathematics.

Nandini Bhowmick

Indiana State University, Terre Haute

Walter E. Washington Convention Center, 209 ABC

402 TECH

Exploring Limits and Approximations of Definite Integrals Using GeoGebra

10-12 Burst

We will share applets that support students' development of critical calculus ideas including limits and approximations of definite integrals. We show how GeoGebra can help students get more accurate estimates of the integral by the limiting process of increasing the number of intervals for left sum, right sum, and trapezoid rule approximations.

Madhavi Vishnubhotla

Montclair State University, New Jersey

Teo Paoletti

Montclair State University, New Jersey

Ceire Monahan

Montclair State University, New Jersey

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)











From Mathematics Teachers' Circles to the Classroom: Making Math Fun for **Students**

6-8 Burst

The Smoky Mountain Math Teachers' Circle is an encouraging, collaborative community of mathematics educators which gathers regularly to explore rich mathematical tasks. Discover how some teachers have been able to transfer these experiences into their own classrooms and make math engaging for their students through exciting hands-on activities.

Nathan Borchelt

Western Carolina University, Cullowhee, North Carolina

Walter E. Washington Convention Center, 201

404 TLC

Full STEAM Ahead: Connecting Math and Art through Symmetry in the Early **Childhood Classroom**

Pre-K-2 Burst

Looking for ways to bring STEAM into your classroom? Symmetry is a natural bridge between math and the arts. In this session, learn strategies for teaching symmetry in early childhood and leave with classroom activities connecting art and symmetry. Learn to introduce students to symmetry in art around the world and implement tech-based activities.

Nicole Fletcher

University of Pennsylvania, Philadelphia

Walter E. Washington Convention Center, 207 A

405 CCC

Just Who Was Pythagoras, Anyway, and Why Does It Matter?

General Interest Burst

Three centuries before Euclid, Pythagoras used mathematical reasoning to understand the human experience in dimensions, from spiritual to practical to aesthetic. You will follow his work, including calculations, from his days as student traversing the Mediterranean to the founding of his school to the heights of his power to his noble death.

Vin Urbanowski

Academy of Information Technology & Engineering, Stamford, Connecticut

Walter E. Washington Convention Center, 151 B

Learn about Your Community: Teaching with Census Bureau Data

Coaches/Leaders/Teacher Educators Burst

The U.S. Census Bureau will discuss the benefits of Statistics in Schools, a useful program for educators that offers free online activities and resources. Speakers will showcase a variety of data access tools the Census Bureau offers and discuss how these tools can help bring real-life, relevant data into your classroom.

Victoria Glasier

U.S. Census Bureau, Suitland, Maryland

Walter E. Washington Convention Center, 101

407 TLC

Math in Motion: Moving for Learning

General Interest Burst

Experience activities designed to get students moving as they master math content. Explore how incorporating movement engages students, deepens understanding, increases motivation, and improves fluency. Learn simple techniques for creating your own math motion activities. Leave with ideas to get your students moving and learning.

Susan McMillen

SUNY Buffalo State, New York

Walter E. Washington Convention Center, 144 ABC

408 TLC

Math Talk and Cookies: Devouring **Mathematical Discourse**

3-5 Burst

This session will explore creative ways to promote discourse in the elementary mathematics classroom. Participants will examine a sweet cookie metaphor to name and describe tools and structures for math talk. They will have the opportunity to devour a math task much the same way they might attack a plate of cookies.

Melissa Garber

@MissGarbMath

Jordan School District, West Jordan, Utah

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)













128

Mind over Matter: Growth Mindset in the Postsecondary Classroom

Higher Education Burst

In higher education, we also encounter many students who possess a fixed mathematical mindset. This session will outline strategies to encourage growth mindsets in select general studies math courses and math support services. We will share our research findings and discuss bridging opportunities between high school and college math classrooms.

Amy Nebesniak

University of Nebraska-Kearney

Kaye Sorensen

University of Nebraska–Kearney

Keri Pearson

University of Nebraska-Kearney

Marriott Marquis, Independence Ballroom E (Level M4)

410 TLC

Motivating an Intellectual Need for **Proofs in Geometry**

8-10 Burst

Want a better answer for why students have to learn proofs? This session will present tasks involving universal statements that help develop a need for proofs. Video clips and data from a design experiment will be shared to show conversations that can occur during the tasks to promote proofs as a way of knowing why a conjecture is true.

Kimberly Conner

University of Missouri, Columbia

Marriott Marquis, Capitol/Congress (Level M4)

411 A&E

Muffins and Math: Empowering Families through Community Outreach, **Games, and Resources**

Pre-K-2 Burst

Muffins and Math are morning workshops that invite parents to learn and play games that can help build number sense and fluency. Come learn how one school increased attendance by offering translators for native languages.

Carly Borchelt

Jackson County Schools, Cullowhee, North Carolina

Walter E. Washington Convention Center, 143 AB

No Butterflies Allowed! Best Practices for Comparing Fractions across the Grades

3-5 Burst

Come hear how the "butterfly trick" taught by a colleague confused our students and how we resolved it. The progression of comparing fractions will be discussed along with reasons why tricks can be harmful to students in later classes. Specific researchbased strategies, not tricks, will be shared to provide a coherent path for students.

Patti Swan

Madison County Schools, Ridgeland, Mississippi

Walter E. Washington Convention Center, 202 B

413 CCC

Play the "Price Is Right" Showplace Showdown Game and Then Discover the Math and Statistics Used

8-10 Burst

Participants form groups of three, receive handouts and hamster wheels, then label the wheel (like the "Big Wheel") and play "Showplace Showdown." Goals and objectives of "Showplace Showdown" are students 1) use problem solving, measurement, and geometry to label the wheel and 2) calculate spin experimental probabilities/discuss results.

Kathleen Mittag

University of Texas at San Antonio

Walter E. Washington Convention Center, 150 B

414 A&E

Ready for Algebra and beyond for Students with Mathematical Learning Difficulties

6-8 Burst

This session shares a trajectory of underprepared students' key developmental understandings of prealgebra and algebra concepts and their relationship to advanced mathematics readiness. We share rich tasks, games, tools, and differentiation strategies that promote meaningful student understanding of prealgebra and algebra concepts.

Hea-Jin Lee

The Ohio State University at Lima

Leah Herner-Patnode

The Ohio State University at Lima

Ivo Herzog

The Ohio State University at Lima

Walter E. Washington Convention Center, 152 B













415 MODEL

Show Me the Math! Building Number Sense through Finger Counting

Pre-K-2 Burst

Experience a progression of unique finger-counting techniques that deepen number sense, and increase speed and accuracy with addition, subtraction, and multiplication. Participants will have an opportunity to practice these engaging activities and then return to the classroom ready to implement a strong fluency program with confidence.

Melanie Gutierrez

Great Minds, Philadelphia, Pennsylvania

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

Totally Techie Teacher Teaches Math

Pre-K-2 Burst

Interested in integrating technology into the classroom? Come find out easy ways to utilize technology to help students improve their math skills. Games can be used for independent work or for whole class. You will leave with a list of free computer games and apps to use in your classroom immediately for student practice and assessment.

Lauren Speiser

@MissSpeiser

Howard County Public Schools, Laurel, Maryland

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

416.1 TECH

Coding in Scratch: Coding Activities in Algebra, Geometry & Precalculus

8-10 Burst

Students learn block-based coding immediately—so instead of teaching coding, let's use coding to teach math! Coding projects in algebra, geometry, and precalculus will be presented as well as important coding concepts. If you'd like to code along, download Scratch or code online from scratch.mit.edu or snap.berkeley.edu.

Martin Funk

New Trier High School, Northfield, Illinois

Walter E. Washington Convention Center, 204 AB

12:00 P.M.-1:30 P.M.

Dedicated Exhibit Hall Time

1:30 P.M.-2:30 P.M.

417 A&E

Address Learning Gaps with White **Board Exchanges**

6-8 Session

Join us as we explore White Board Exchanges and how they can be used to formatively assess student understanding, deepen number sense, and address learning gaps. These engaging, adrenaline-rich exchanges are one of the coherent instructional tools utilized throughout the OER Eureka Math/Engage NY. In this session, we will make them come to life!

Penny Gennuso

@Pennygennuso

Great Minds, Washington, D.C.

Miko Mc Daniel

Great Minds, Washington, D.C.

Walter E. Washington Convention Center, 203 AB

Building a Community of Problem Solvers

Pre-K-2 Session

Join us as we explore how to establish a community of learners who can share their thinking with others as we use problem solving to introduce and deepen student understanding of various math concepts. We will also discuss how to go beyond show and tell when sharing student strategies. Leave with ideas to use in your classroom on Monday.

Lori Price

@lorikayprice

St. Johns County Schools, Ponte Vedra Beach, Florida

Walter E. Washington Convention Center, Salon I











Common Sense Percents

6-8 Session

Break away from procedures! This session will help you learn how to build a deep, conceptual understanding of percentages within your students, as we focus on connections and sense making. Through the use of ratio tables and double number lines, your students will increase their flexibility and fluency in working percent problems.

Jerra Wood

y@JerraLWood

Boone County Schools, Burlington, Kentucky

Walter E. Washington Convention Center, 150 A

420 CHANGE

Embracing Quantitative Literacy and Statistical Thinking for All High School Students

8-12 Session

Essential Concepts in *Catalyzing Change* for quantitative and statistical literacy focuses on making sense of data, conducting statistical investigations, interpreting statistical information, and using conditional probability to make decisions. Well-chosen examples will illustrate why these ideas are important and how they develop student reasoning about data.

Christine Franklin

American Statistical Association, Watkinsville, Georgia Ed Dickey

Retired, University of South Carolina, Columbia Gail Burrill

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Michigan State University, East Lansing Daniel Teague

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; North Carolina School of Science and Mathematics. Durham

Marriott Marquis, Liberty Ballroom L (Level M4)

421 CCC

Curriculum with a Message

10-12 Session

High school courses often lack meaningful flow or themes that are obvious to students. What if students could see the entire scope of algebra 2 in four weeks? Or learn the language of calculus in five? We will explore how you can take standards and craft a message that makes your curriculum more meaningful and more than a random set of tasks.

Jonathan Claydon

y@rawrdimus

Spring Branch ISD, Houston, Texas

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)

422 MODEL

Engaging Students with Contextual Applications

10-12 Session

Do you use contextual situations from careers to motivate math? High school math teachers collaborated with community college program directors to build such classroom activities. Topics range from common core I through precalculus. Activities are written to actively involved students, use technology appropriately, and expose them to many careers.

Jay Martin

Wake Technical Community College, Raleigh, North Carolina Tamara Ormandy

Garner Magnet High School, North Carolina

Marriott Marguis, Liberty Ballroom L (Level M4)

423 TLC

Enticing All Students to Contribute to Rich Math Discussions

General Interest Session

So much talk about math talk in the classroom. Come learn the secrets to facilitating whole class mathematics discussions that develop robust reasoning and the capacity to argue mathematically. Find out how to engage all students, even those who will not talk during math discussions, to willingly speak up. We will share video clips and talk tools.

Lucy West

★ @ MetamorphTLC, #MetaTLC

Metamorphosis TLC, New York, New York

Metamorphosis TLC, New York, New York

Metamorphosis TLC, Ne

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)













Extending the Conversation: Making Sense of Graphs from Multiple **Perspectives**

8-10 Session

A father and son run a race. Who won? Is that all? Technology provides new approaches to classic problems in school mathematics. Examine how this problem can be extended using multiple representations and dynamic software. Come make sense of mathematical concepts in context, watch classroom videos, and discuss implications for practice.

Erhan Haciomeroglu

University of Central Florida, Orlando Janet Andreasen University of Central Florida, Orlando **Edward Nolan**

Towson University, Maryland

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)



Eye on the Future: Connecting Algebra 1 and Calculus

8-10 Session

Do you want your students to be ready for calculus? Beyond mere content knowledge, success in upper level math requires students to reason like a mathematician. The Mathematical Practices for AP Calculus are a guide to these vital thinking skills . . . and they can easily be infused in your algebra 1 class!

Michael Manganello

@m_manganello

The College Board, New York, New York

Walter E. Washington Convention Center, Salon G

426 TLC



Facilitating Proficient Mathematical Discourse through Language and **Vocabulary Development**

6-8 Session

The language of mathematics is an essential aspect of sophisticated mathematical discourse, yet students with learning difficulties or English learners may encounter language barriers to engaging in mathematics discourse. This session will focus on useful and practical techniques to support the development of mathematical language.

Elizabeth Hughes

Penn State University, State College, Pennsylvania

Paul Riccomini

Penn State University, State College, Pennsylvania

Stephanie Morano

University of Virginia, Charlottesville

Walter E. Washington Convention Center, 147 B



How to Stop Lecturing and Start Teaching

10-12 Session

This session is about creating a workshop-style classroom where students can learn at their own pace and support each other. The participants will go through several activities to experience the process from a student's perspective.

Tatiana Yudovina

Hawken School, Gates Mills, Ohio

Walter E. Washington Convention Center, 103 B

Plan now for the 2019 NCTM Annual Meeting & Exposition in San Diego, California • April 3–6















Improving Mathematics Instruction for ELs through Practice-Based PD

Coaches/Leaders/Teacher Educators Session

This session describes a professional development program designed to improve mathematics instruction for English learners. Partnering with school districts, the presenters offered grant-funded courses to establish practice-based PLCs with teachers (both mainstream and ESOL). Participants will learn about frameworks, resources, and tools to address both mathematics and language standards.

Rodrigo Gutierrez

University of Maryland, College Park

Carolina Napp-Avelli

University of Maryland, College Park

Marriott Marquis, Liberty Ballroom N-P (Level M4)



Keep Calm and Use Talk Moves

General Interest Session

Facilitating a discussion in math class can be challenging. Teachers must make sure students' ideas are heard and understood and also keep the talk focused on the big idea of the lesson. This session will focus on a set of "talk moves" that teachers can use to manage class discussions so that they are a productive and worthwhile experience for all.

Nancy Anderson

y
@NAndersonMath

Milton Academy, Massachusetts

Marriott Marguis, Independence Ballroom F-H (Level M4)

Let's Argue: Engaging High School Students by Teaching Statistics through **Claims**

10-12 Session

The practice of "claim, evidence, reasoning" is popular in science and the humanities. Curious how my students could apply this practice to argumentation in math, I reinvented, studied, and refined my approach to teaching descriptive statistics. Now my students don't just calculate—they predict, analyze, argue, and defend. Learn how I did it.

Pamela Rawson

@rawsonmath

Baxter Academy for Technology & Science, Portland, Maine Marriott Marquis, Independence Ballroom D (Level M4)

431



Let's Start with a Problem!

3-5 Session

Starting with a problem does more than just engage students—it provides an opportunity to develop mathematical practices, deepen conceptual understandings, and strengthen procedural skills. This session will provide specific examples of instructional tasks relating to number sense, operations with whole numbers, and fraction concepts.

Janet Caldwell

Rowan University, Glassboro, New Jersey

Walter E. Washington Convention Center, 152 A

432



Making Fractions Fun Again for Upper Elementary!

3-5 Session

Join us as we learn how to effectively teach fraction skills in an engaging way so that the children have fun at the same time! We will learn and practice strategies that involve manipulatives and games to make fractions fun again for our upper elementary students.

Jennifer Wilson

Midway Elementary School of Science and Engineering, Anderson, South Carolina

Walter E. Washington Convention Center, 140 AB













Making Moments Matter: Conferring with Young Mathematicians at Work

General Interest Session

If children are to engage in problem solving with tenacity and confidence, good questioning by teachers during conferrals should engender learner excitement and ownership of ideas, while simultaneously be challenging enough to support further development. Video of conferrals in action will be used for examination and analysis.

Catherine Fosnot

New Perspectives On Learning, LLC, New London, Connecticut Walter E. Washington Convention Center, 102 AB

Middle Grades Statistics: Dealing with So Much Content in So Little Time!

6-8 Session

Engage with a project that focuses on the statistical problem solving process and that we use to structure our statistics unit and provide motivation for students. Examine student work and consider how this and similar projects can advance students' abilities to answer statistical questions in a unit that might subsequently take less time!

Susan Peters

University of Louisville, Kentucky

Michelle Gross

Spencer County Middle School, Taylorsville, Kentucky

Walter E. Washington Convention Center, 146 C

Models & Strategies That Highlight **Connections and Coherence For** Struggling Learners

Pre-K-2 Session

Which tools and models develop a strong foundation for pre-K to second-grade learners who are already struggling with mathematics? How can strategically using and connecting particular models in Tier 2 and Tier 3 intervention settings help improve students' mathematical practices so they can begin making sense of their learning with and without a teacher?

Marianne Strayton

Great Minds, New City, New York

Walter E. Washington Convention Center, 146 A

436 ASSESS

Multidimensional Assessment and Evaluation of Mathematics Learners

8-10 Session

As teachers, it is crucial that we provide a personal and engaging experience for the diverse learners in our classrooms. In this session, we will explore how we use a variety of assessments to provide students with meaningful feedback and how it informs our practice. We will discuss products, observations, conversations, and standards-based feedback.

Christine Lovrics

@c_lovrics

Holy Trinity School, Richmond Hill, Ontario, Canada Kristy McGowan

Holy Trinity School, Richmond Hill, Ontario, Canada

Walter E. Washington Convention Center, 154 AB

Thank you to Maryland Council of Teachers of Mathematics and the Virginia Council of Teachers of Mathematics for hosting the NCTM 2018 Annual Meeting & Exposition













Now You Are Speaking My Math Language: Teachers & Students Attend to Precision

6-8 Session

In this presentation, we will look at examples where attention to precision goes beyond correct answers. Teachers and students have to be precise in their language, vocabulary, and examples. Participants will also learn about a writing strategy that will help their students write effectively and precisely when defending their answers.

Stacey Bell

Shawnee Heights USD 450, Tecumseh, Kansas

Walter E. Washington Convention Center, 202 A



Pre-K Math: Practicing Basic Skills while **Introducing More Challenging Concepts**

Pre-K-2 Session

Too often, pre-K math activities focus on rote recitation and memorization. This session will present strategies for helping young students move far beyond counting and number recognition. Learn fun, engaging methods for introducing challenging math concepts in ways that can both teach and reinforce the more basic skills.

Joseph Robinson

™@MrJoeRo

E.L. Haynes Public Charter School, Washington, D.C.

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

439 CHANGE A&E

President-Elect Address: Catalyzing Change: Identity, Agency, Positioning, and Equitable Instructional Practices

General Interest Session

This session makes connections between equitable instructional practices and identity, agency and positionality. Specifically, the session uses a vignette to examine how high cognitively demanding task provide opportunities to engage learners in meaning discourse positioning learners as mathematically competent. The session uses mathematical discourse community as a framework for connecting mathematics norms of discourse to identity and agency. While this session highlights Catalyzing Change for High School *Mathematics*, the discussions of teaching practices that cultivate identity, agency, and positionality is appropriate for all educators.

Robert Berry, III

President-Elect, National Council of Teachers of Mathematics, Reston, Virginia

Walter E. Washington Convention Center, Ballroom B



Re-Envisioning Mathematics Education: Transcending Boundaries to Achieve Equity and Empowerment

General Interest Session

This session will highlight a transformative framework for mathematics teaching that can guide guide educators in achieving equity outcomes for students. This session will provide participants with a holistic research-based approach to mathematics education and provide practical strategies that can be used to empower all students in mathematics.

Roni Ellinaton

Morgan State University, Baltimore, Maryland

Walter E. Washington Convention Center, Ballroom C













Systemic Empowerment with Hands-On **Fraction Activities**

3-5 Session

Empowering students begins with helping teachers develop conceptual understanding and broaden their toolbox of strategies. We will share how we worked with coaches and teachers to develop a more robust understanding of fractions, how that work was supported in the classrooms, and the impact on student learning.

Kelly Edenfield

@kwedenfield75

Carnegie Learning, Pittsburgh, Pennsylvania

Donicka Herod

Prince George's County Public Schools, Maryland

Walter E. Washington Convention Center, 145 AB



Teaching Preservice K–8 Teachers Geometry and Reasoning through **Purposeful Play**

Higher Education Session

How do we help elementary education majors recognize their role in developing a growth mindset in their students and in preparing the foundation for more rigorous reasoning? How do we help them appreciate and understand the connections between geometrical concepts? This course conquers both challenges through active learning.

Teresa Magnus

Rivier University, Nashua, New Hampshire

Walter E. Washington Convention Center, 204 C

The Force Field of Mathematics, NGSS, and Technology Instruction

3-5 Session

Use the power of mathematics, the Next Generation Science Standards, and technology to empower all students. Each of these components is powerful on its on, but taught in conjunction they have the power to transform classroom instruction and lift the levels of all students' sense of wonder, discourse, critical thinking, and agency.

Danielle Moore

@Teaching1Moore

Teaching One Moore, Los Angeles, California

Walter E. Washington Convention Center, Salon C

444 PROF

The New Professionalism: Empowering Teachers as Researchers, Accomplices, and Agitators

General Interest Session

Teaching is a profession under siege. Some legislators and policymakers are devaluing and defunding teacher professional development and collaboration. This session shares sensible ways in which teachers can reclaim the profession through action research collaborations and advocacy using data from the Milwaukee Master Teacher Partnership.

Mike Steele

@mdsteele47

University of Wisconsin-Milwaukee

Casey McCormick

Our Lady of the Assumption School, Carmichael, California

Walter E. Washington Convention Center, Ballroom A











445 ASSESS

Using Communities of Practice to Guide the Use of Everyday Assessment for Your Math Classroom!

Coaches/Leaders/Teacher Educators Session

Participants will be engaged in developing communities of practice, utilizing the Formative 5 (observations, interviews, Show Me, hinge questions, and exit tasks) classroom-based formative assessment techniques. See how use of the Formative 5 can serve as a powerful example of a school-based community of practice which will transform your teaching.

Francis (Skip) Fennell

y @SkipFennell

Past President, National Council of Teachers of Mathematics. Reston, Virginia; McDaniel College, Westminster, Maryland **Beth Kobett**

Stevenson University, Baltimore, Maryland

Jonathan Wray

Stevenson University, Baltimore, Maryland

Walter E. Washington Convention Center, 146 B

446 TLC

We Run This: A Blueprint for Student-**Led Discourse**

10-12 Session

Come learn about two teachers' journey to make our students become teachers and how it revolutionized our classrooms. We'll analyze video of student work and reflect on essential questions: What parts of "teaching" can—and should—we entrust to students? What do they—and we—stand to gain if we share our responsibility as teachers?

Benjamin Walker

@bwalkerq

Walter Payton College Prep, Chicago, Illinois

Sara Heiberger

Walter Payton College Prep, Chicago, Illinois

Marriott Marquis, Liberty Ballroom M (Level M4)

ew T ccc **How Students (Should) Learn Times** Tables?

Pre-K-2 Exhibitor Workshop

As educators, are we guilty of focusing on rote procedures and tedious computations in the teaching of times tables? Basic skills develop abilities needed to learn abstract topics, learning times tables improves students' number sense. Participants will be introduced to a wide range of strategies to facilitate the learning of times tables.

Shing Lee Publishers

Singapore

Walter E. Washington Convention Center, 143 C

446.2 **EW** CCC

Do Not Invert and Multiply! Building the Bridge to Algebra through Fractions **Tasks**

3–5 Exhibitor Workshop

Join Cassandra Turner, Beth Curran, and Allison Coates as they work through hands-on tasks for fractions. We'll investigate how the progression of fractions problems helps students build mastery of algebraic concepts such as naming unknown quantities, writing expressions, and laying the foundation for solving for *x*.

Singapore Math, Inc.

Tualatin, Oregon

Walter E. Washington Convention Center, 159 AB

446.3 **EW** TECH

Enhancing Number Talks with Simulations

General Interest Exhibitor Workshop

Building a foundation of number sense and fact fluency using number talks helps students take ownership of their mathematical understanding. Number talks are also beneficial when used alongside inquiry-based learning tools, like simulations. Discover how online simulations can enhance number talks and help students understand mathematical concepts.

ExploreLearning

Charlottesville, Virginia

Walter E. Washington Convention Center, 158 AB













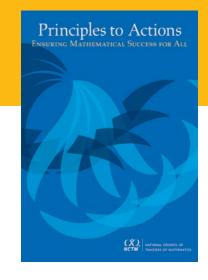
Principles to Actions **Professional Learning Toolkit**

CTM's Principles to Actions Professional Learning Toolkit provides grade-band-specific professional learning modules focused on the Effective Teaching Practices and Guiding Principles from Principles to Actions: Ensuring Mathematical Success for All—NCTM's landmark publication that connects research with practice. Specific research-based teaching practices that are essential for a high-quality mathematics education for each and every student are combined with core principles to build a successful mathematics program at all levels.

The *Principles to Actions* toolkit helps support professional learning with teachers by analyzing mathematical tasks, narrative and video cases, student work samples, vignettes, and more. Each

module includes a presentation, presenter notes, and required materials. Teachers learn by abstracting general ideas from the specific examples about how to effectively support student learning.

The teaching and learning modules were developed in collaboration with the Institute for Learning at the University of Pittsburgh and are available exclusively to NCTM members. Limited modules are provided for each grade level.



Building on Principles to Actions

Many related publications build on Principles to Actions and the toolkit.

Principles to Actions-related publications explore implementing the effective mathematics teaching practices; go in depth about the research behind Principles to Actions; and elaborate on such topics as access and equity, tools and technology, assessment, and more.

- Taking Action: Implementing Effective Mathematics Teaching Practices in—
 - Grades Pre-K-5
 - Grades 6-8
 - Grades 9-12

This set of grade-band books elaborates on the teaching and learning principles described in Principles to Actions. Each book provides examples and activities to help teachers develop their understanding of the eight effective mathematics teaching practices and how they can be enacted in the classroom.

 Enhancing Classroom Practice with Research behind "Principles to Actions"

This book summarizes and synthesizes the research behind each of the guiding principles and essential elements in Principles to Actions. It also provides examples of what this research might look like in classroom practice. This resource will provide readers with a sense of where the field stands in its knowledge and hypotheses about the big ideas put forth in Principles to Actions. In addition, it makes the principles and elements—as well as the research concrete for readers by offering examples from classroom practice.



- Access and Equity: Promoting High-Quality Mathematics in—
 - Grades Pre-K-2
 - Grades 3-5
 - Grades 6-8
 - Grades 9-12
- Principles to Actions Elaboration Series
 - Access and Equity
 - Curriculum
 - Tools and Technology
 - Assessment
 - Professionalism













446.4 **EW** TECH

Level Up with Games-Based Math: See Engagement, Persistence, and **Achievement Skyrocket in Your Class**

Coaches/Leaders/Teacher Educators

Exhibitor Workshop

Learn to leverage adaptive, game-based challenges and gamification principles to provide joyful, 'just in time' activities that personalize learning for all students. Teachers, coaches, and administrators will experience practical strategies for 1:1, computer lab, and BYOD device settings to move K-12 students to deeper levels of understanding.

Mangahigh.com

London, United Kingdom

Walter E. Washington Convention Center, 156

1:30 P.M.-2:45 P.M.



Building Meaning into Algebra Equations with Multiple Representations and Progressive Formalization

6-8 Workshop

Progressive formalization is a curriculum design theory that helps students mathematize informal experiences into formal mathematics. Participants will explore activity sequences that guide students to deeper understandings of the meaning and structure of algebra equations and see how this theory forms a research base for Principles to Actions.

Frederick Peck

University of Montana, Missoula

Raymond Johnson

University of Colorado Boulder

David Webb

University of Colorado Boulder

Walter E. Washington Convention Center, 147 A

448

Cracking Those Conditionals: Modeling Data for Some Classic c Probability Problems

8-10 Workshop

Probability problems are challenging enough when they involve straightforward analysis of outcomes and their respective likelihoods. When chance events are "conditioned," the analysis, thinking, and modelling of outcomes can catalyze misconceptions and lead to great opportunities for critique and debate. "What do we know, and "WHEN did we know it?"

J. Michael Shaughnessy

Past President, National Council of Teachers of Mathematics. Reston, Virginia; Portland State University/Teachers Development Group, Oregon

Walter E. Washington Convention Center, 207 B



Do-It-Yourself Fractal Functions: **Connecting Geometry, Measurement,** and Algebra

10-12 Workshop

Use concepts of geometry and measurement to create fractal cards. Use the cards to develop the concept of function by representing their characteristics with words, symbols, tables, and graphs. Examine how the tasks can be used to differentiate instruction in diverse classrooms and serve as assessments. Classroom-ready materials will be available.

Mandy McDaniel

Boise State University, Idaho

Teri Willard

CWU, Belgrade, Montana

Walter E. Washington Convention Center, 209 ABC













450 TLC

Early Learning: Cultivating Effective Student Discourse to Enhance Mathematical Understandings

Pre-K-2 Workshop

When we are born, we hear mysterious sounds and try to make sense of them. For children, the same is true for mathematical vocabulary. In this session, you will dive into the early learning classroom and see how the language of math is cultivated and honored and how children catapult themselves to success through the art of communication.

Jessica Bobo

ORIGO Education, Inc., Earth City, Missouri

Walter E. Washington Convention Center, 144 ABC

451 PROF

Engaging Teachers in Collaborative 5E Lesson Planning with Effective Teaching Practices

Coaches/Leaders/Teacher Educators Workshop

Lesson plans are the road maps teachers use to guide their classroom instruction and student learning. By working to plan a lesson around the research-informed 5E instructional framework, participants will learn key questions to ask themselves as they collaboratively plan for instruction and reflect on the decisions they make during planning.

Karla Bandemer Lincoln Public Schools, Nebraska Becky Evans Lincoln Public Schools, Nebraska

Walter E. Washington Convention Center, 101

452 MODEL

Engaging Young Students in Mathematical Modeling

3-5 Workshop

Mathematical modeling (MM) is not only a SMP but also a skill all students should learn and be engaged in. In this session, MM will be introduced as a concept, presented as a teaching strategy, and integrated into culturally relevant tasks that participants will model and then discuss what they have learned about MM in grades 3-5.

Derek Sturgill

Ohio University, Athens

Reuben Asempapa

Penn State Harrisburg, Pennsylvania

Walter E. Washington Convention Center, 206

453 TLC Engineering Design Briefs for Math in Grades 4–6

3-5 Workshop

Multiple classroom-tested engineering design briefs will be shared that correlate to grades 4–6 mathematics standards. Learn how classroom teachers can use STEAM to support learning of fractions, geometry, probability, measurement, and more. Materials will be provided for participants to try one or more design challenges.

Tracy Proffitt

©tracyjoproffitt Lynchburg City Schools, Virginia Patsy Sellers Lynchburg City Schools, Virginia

Marriott Marguis, Marguis Ballroom Salon 4 (Level M2)



Visit **nctm.org/classroomresources** for lessons, activities, and teacher resources.











Experience Algebra in Meaningful Contexts through Active Engagement

8-10 Workshop

Experience how investigations can empower your students to think about linear and quadratic relationships through generating and graphing data about themselves and exploring puzzle and visual patterns to unlock algebraic thinking. There will also be a opportunities to engage in problem solving, reasoning, and using structure through the tasks.

Fay Zenigami

University of Hawaii at Manoa, CRDG, Honolulu Linda Venenciano

University of Hawaii at Manoa, CRDG, Honolulu Kara Suzuka

University of Hawaii at Manoa, CRDG, Honolulu

Walter E. Washington Convention Center, Salon H



Finding Patient Zero: Do Data Science in **Your Math Class**

10-12 Workshop

Do data science in your classroom! Students will plumb huge datasets, construct visualizations, organize messy data, use technology to focus on what's important, make arguments . . . and stop the epidemic! And save lives!—and more. Free web-based software and materials. Good for APCSP. Developed with support from NSF. Bring laptops!

Timothy Erickson

★@eeps

Lick-Wilmerding High School, San Francisco, California

Marriott Marquis, Liberty Ballroom I-K (Level M4)

Fractions: Red, White, and the Blues-**How Technology Can Help**

3-5 Workshop

Fraction blues? This lively workshop will explore practice-rich tasks that integrate manipulatives and the appropriate use of technology to build conceptual and procedural understanding of fractions. Leave with strategies for combining TI calculators, iPad, and SMART Notebook software to make fraction operations meaningful, accessible, and fun!

Christine Ruda

Teachers Teaching with Technology (T3), Miami, Florida Marriott Marquis, Independence Ballroom A-C (Level M4)

457 TLC

FUN with Polynomial FUNctions

10-12 Workshop

Come explore quadratic, cubic, and quartic functions using multiple representations including physical models, tables, graphs, and expressions. Teachers will actively participate in lessons using manipulatives and technology including color tiles, algebra tiles, and Desmos. Experience inquiry-based, learner-centered, collaborative activities.

Christine Larson

★@CLL2718

South Dakota State University, Brookings

Sharon Vestal

South Dakota State University, Brookings

Walter E. Washington Convention Center, 207 A



GeoGebra + GoFormative for **Problem Solving, Problem Posing, and** Assessment

10-12 Workshop

Make problem solving and assessment come alive by combining GeoGebra and GoFormative. We will solve and assess rich, open-ended, and powerful geometric problems involving parallelograms, congruence, and similarity, and the Pythagorean theorem. Presenters will share premade files and projects, so bring your own device to follow the activities.

Roberto Soto

California State University, Fullerton

Armando Martinez-Cruz

California State University, Fullerton

Walter E. Washington Convention Center, 151 B













Math, Science, and Language Arts . . .

Pre-K-2 Workshop

Participants will experience and engage in hands-on activities which will integrate mathematics across the disciplines, such as science, art, social studies, and language arts. The activities will highlight appropriate standards, i.e., CCSSM and NGSS. Participants will receive a handout with bibliography and full description of needed resources.

Maria Diamantis

Southern Connecticut State University, New Haven Adam Goldberg

Southern Connecticut State University, New Haven

Walter E. Washington Convention Center, 143 AB

460 PROF

MQI Coaching: From Research to **Practice**

Coaches/Leaders/Teacher Educators Workshop

This session tells the story of how an instrument designed for research, the Mathematical Quality of Instruction rubric (MQI), has become a valuable tool for improving instruction. Participants will experience key components of the MQI Coaching model in an interactive discussion and will then learn about research findings from a randomized trial.

Claire Gogolen

y@MQIclaire

Harvard University, Cambridge, Massachusetts

Samantha Booth

Harvard University, Cambridge, Massachusetts

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)

Using Students' Creative Problem Solving to Build Algebraic Fluency from Conceptual Understanding

8-10 Workshop

TLC

When students learn arithmetic they begin with contextual problems, build their own strategies, and generalize them. How can that happen when the content is algebraic manipulation? We'll use student work on problems that make sense to students to explore how students' creative solution methods can be generalized to abstract algebraic procedures.

Max Ray-Riek

@maxrayriek

Illustrative Mathematics, Philadelphia, Pennsylvania

Walter E. Washington Convention Center, 207 B

462 TLC

Problem-Solving Tasks and Games That Develop Meaning by Connecting Multiple Strategies

Pre-K-2 Workshop

Students may have multiple strategies, but do they understand how various strategies relate or know when using each is best and most efficient? Explore tasks and games that support students in making connections among multiple addition and subtraction strategies so they become flexible, strategic problem solvers.

Jennifer Leimberer

@MathTrailblazers

University of Illinois at Chicago Teaching Integrated Math and Science Project

Elizabeth Cape

University of Illinois at Chicago Teaching Integrated Math and Science Project

Sandra Niemiera

University of Illinois at Chicago Teaching Integrated Math and Science Project

Marriott Marquis, Independence Ballroom E (Level M4)











463 TLC

Proofs without Words in High School Geometry

8-10 Workshop

Learn how to differentiate and scaffold a variation of Proofs without Words (PWWs) to ensure that all high school geometry students can engage in meaningful discourse and productive struggle. Gain hands-on experience with 12 multi-diagram puzzles that prove 24 theorems. Leave with free access to editable student documents and teacher resources.

Wayne Nirode

Miami University, Oxford, Ohio

Marriott Marquis, Capitol/Congress (Level M4)

Putting a Positive Spin on Negative Numbers

6-8 Workshop

No need to fear negative numbers! During this workshop, a variety of kinesthetic, tactile, and visual integer games will be shared. Activities include simulated mini golf, Bingo, an integer ops line dance, a Cauldron card game, Jeopardy, and Concentration. Participants will receive a CD containing files for all the activities and much more!

Shelley Rea Hunter

Carleton North High School, Florenceville, New Brunswick Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)

465 PROF

Supporting Lesson Design with Instructional Rounds

Coaches/Leaders/Teacher Educators Workshop

How do teacher teams make connections between content, process standards, and NCTM's Mathematical Teaching Practices? Intentional lesson design and reflection are the keys to unlocking this question. Explore tools and strategies within instructional rounds to create and reflect upon lessons that promote mathematical understanding.

Mona Toncheff

@toncheff5

Scottsdale Community College, Phoenix, Arizona

Sarah Schuhl

Mathematics at Work, Gresham, Oregon

Walter E. Washington Convention Center, 201

Teaching Math + Computational Thinking in Grades 3-5 (with Scratch)

3-5 Workshop

A team of teachers, computer scientists, researchers, and curriculum writers has been developing tools for elementary school teachers to use to bring more computational thinking into their mathematics classes. Come and learn how you can use these resources to help bring CS to all! No previous experience required but bring your own device.

Andy Isaacs

@maththoth

University of Chicago, Illinois

Carla Strickland

University of Chicago, Illinois

Andrew Binkowski

University of Chicago, Illinois

Walter E. Washington Convention Center, 149 AB

467 TLC



Transformational Geometry: Facilitate Meaningful Discourse through Student Investigations

8-10 Workshop

Come join an interactive session on transformational geometry. Explore how to facilitate meaningful discourse while engaging students in hands-on activities used to transform figures and to predict the effect of a given rigid motion on a given figure while using manipulatives and handheld technology.

Christine Thomas

Georgia State University, Atlanta

Walter E. Washington Convention Center, 202 B













Visual Reasoning: Seeing and **Learning Mathematics**

Pre-K-2 Workshop

Problem-solving tasks that engage children in visual reasoning challenge them to use and connect representations while developing mathematical ideas. Come and examine activities designed for children to use their visual abilities while learning number, geometry, and measurement concepts.

Kay Wohlhuter

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; University of Minnesota Duluth

Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

469 TECH

We're Doing Something Right When We Hear, "This Is the Best PD I've Ever Been Involved With!"

8-10 Workshop

An exciting project engaged over 70 teachers across the state of Hawaii to "Desmos-ify" their lessons. Learn how effective pedagogy, combined with the purposeful use of Desmos, changed teachers' mindsets for designing lessons and increased student engagement and understanding. Teacher-created resources ready for classroom use will be shared.

Dewey Gottlieb

y@dewgott

Hawaii Department of Education, Honolulu

Yannabah Weiss

Kealakehe High School, Kailua Kona, Hawaii

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

TECH

Weaving Mathematics, Art, and Computational Thinking through Native **American Star Quilts**

8-10 Workshop

Learn about an innovative geometry lesson that weaves mathematics concepts, art, and computational thinking through the virtual presentation of Native American star quilts via TI-Nspire graphing technology and Python coding. Participants will explore transformational geometry concepts in an engaging, culturally relevant activity.

Alice Fisher

@afisherteach

Bellaire High School, Houston, Texas

Walter E. Washington Convention Center, 103 A

TLC

What Is Right with Wrong Answers? Leveraging the Success in Student "Failure"

3-5 Workshop

Come and investigate how to leverage student work to elicit student thinking and use evidence to further instruction. Participants will analyze "failed" student work on a rich task related to fractions to focus on student knowledge. Focus on using an asset approach to student work supports math agency of all students. Relevant to grades 3–8.

Sara Birkhead

George Mason University, Fairfax, Virginia

Jennifer Suh

George Mason University, Fairfax, Virginia

Walter E. Washington Convention Center, 152 B











472 **CCC**

Which Comes First: The Equation or the **Function? Come Stack Cups and Use Demos to Find Out!**

8-10 Workshop

Experience classroom-tested, engaging lessons to help students understand how functions and equations are related. We will use concrete objects to model a linear function and interpret the meaning of solving in this context and also see how Desmos can be used to relate exponential functions to the solutions of the equations represented by them.

Karajean Hyde

University of California, Irvine Janna Canzone University of California, Irvine Jeff Hruby University of California, Irvine

Walter E. Washington Convention Center, 150 B

3:00 P.M.-4:00 P.M.

473 ISSUES

A Transformational Approach to Congruence Proofs in High School Geometry

10-12 Session

CCSSM HS Geometry clusters include "Understand Congruence in Terms of Rigid Motions" and "Prove Geometric Theorems." But the standards don't tell us how to approach these proofs using transformational assumptions. This session will address this deficiency by providing new assumptions, updating some definitions, and discussing some proofs.

Lew Douglas

@lewdouglas

Stanford Online High School, Oakland, California

Henri Picciotto

Math Education Consultant, Berkeley, California

Marriott Marguis, Marguis Ballroom Salon 12&13 (Level M2)

Alligators, Bunnies, and Turtles, OH **MY! How Did Animals Creep into My Mathematics Instruction?**

3-5 Session

Who hasn't tried to make a concept easier by trying to make a connection to something kids love? Yet, in our attempt to help, we actually may hinder student learning. We address the dangers of allowing animals to creep into instruction, provide a rationale for conceptual alternatives, and showcase strategies to enhance your mathematics instruction.

Kristin Harbour

University of Alabama, Tuscaloosa

Stefanie Livers

Missouri State University, Springfield

Walter E. Washington Convention Center, 146 A

475 PROF

Becoming Colleagues: Peer-Developed Supports in a Self-Determined Dual License Program.

Research Session

A concern for the incoming mathematics teacher is that they enter a field where teachers are under increased stress and criticism leading to early burnout. If early in their career, we develop a supportive network based on freedom, loyalty, and interdependence, this habit will carry on as a protective factor in their future work as teachers.

Anthony Rodriguez

Providence College, Rhode Island

Reed Fraser

Providence College, Rhode Island

Jamie Metzger

Providence College, Rhode Island

Walter E. Washington Convention Center, 103 B













476 TLC

Beyond the Estimation Jar

3-5 Session

How do teachers help students develop strategies to make reasonable estimates? Do we make the connection to computation? In this session, participants will learn how to engage students and spark curiosity by intentionally selecting estimation tasks and activities that can turn into launching points for instruction.

Michele Glenn

Howard County Public School System, Ellicott City, Maryland **Matthew Brewrink**

Howard County Public School System, Ellicott City, Maryland

Walter E. Washington Convention Center, 147 B



Beyond the Standard Algorithm: Developing a Conceptual Understanding of Division

3-5 Session

Division is a difficult topic to learn and teach. Children's understanding of division is often limited to an intuitive understanding of equal sharing and the standard algorithm with nothing in between. We will use Digi-Blocks to build a conceptual understanding of division and explore alternatives to the standard long division algorithm.

Jennifer Lewis

Union East Elementary School, Cheektowaga, New York Rachel Burke

Union East Elementary School, Cheektowaga, New York

Walter E. Washington Convention Center, 150 A



Calculus for Everyone: A Cohesive and Coherent Pathway Curriculum

10-12 Session

Our Math for America Master Teacher Fellowship has given us the opportunity to create a two-year Pathway to Calculus Curriculum that has done wonders for our AP program. We will share our sequencing of topics, lessons, and questioning techniques that have helped students feel more prepared and excited to take on AP Calculus.

Nate Goza

@thegozaway

Math for America, Los Angeles, California

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

Tools & Technology









Changing Mindsets to Tackle Equity: From the New York Times to the Classroom—One District's Journey

3-5 Session

ALL learners should have access to rigorous, highlevel mathematical content in an environment where risk-taking, deep conceptual understanding, and growth mindset are the norm. We will share lessons learned from our journey to reconceptualize the upper elementary math program and shifts we made to empower teachers and students as mathematicians.

Melissa Pearson

@pearsonwwp

West Windsor-Plainsboro Regional School District, New Jersey

West Windsor-Plainsboro Regional School District, New Jersey Mary Ann Carnevale

West Windsor-Plainsboro Regional School District, New Jersey

Walter E. Washington Convention Center, 202 A

480 ISSUES

Creating Equitable Mathematics Classrooms: Listening to What Children Have to Teach Us

General Interest Session

Children's experiences lie at the heart of inspired teaching. We share invaluable insights from children about how they experience mathematics discussions. What does it mean for children in linguistically, culturally, and racially diverse classrooms to be known by their teacher? How can listening to children help us create more equitable classrooms?

Elham Kazemi

🤟@ekazemi

University of Washington, Seattle

Allison Hintz

University of Washington, Seattle

Walter E. Washington Convention Center, Ballroom B

Educational Opportunities from the Comfort of Your Desk

Take advantage of NCTM's live online webinars to interact with peers and expand your learning on a variety of topics without leaving your home or office. Choose from three categories of webinars to advance your professional development:



President's Messages

Dive deeper into topics presented in recent messages from NCTM President Matt Larson.



Author Talks

Master the essentials of NCTM's publications with these webinars based on popular publications.



Collective Action to Develop Awareness: Equity and Social Justice in Mathematics Education

As part of the continuing work and collaboration of NCTM, we invite you to participate in quarterly webinars on Equity and Social Justice in Mathematics Education.

Past webinar recordings are available to access anytime!



Recent webinar topics include:

- Reimagining the Mathematics Classroom
- Enhancing Classroom Practice with Research behind Principles to Actions
- Taking Action: Implementing Effective Mathematics Teaching Practices
- A Perfect Storm of Data: We Must Take Action!
- Reasoning and Sense Making in the Mathematics Classroom (Series)



Developing Reasoning and Problem-Solving Skills through Children's Literature

Pre-K-2 Session

Literature can provide the context for rich tasks and opportunities for children to engage in high levels of mathematics. This session will focus on engaging in literature-based rigorous tasks and analyzing student work. Participants will leave with strategies and tasks designed to develop reasoning and problem-solving skills with their students.

Cynthia Cliche

@cindycliche1

Murfreesboro City Schools, Tennessee

Jeremy Winters

Middle Tennessee State University, Murfreesboro

Walter E. Washington Convention Center, 146 C

482 TLC

Ditch That Lecture: Designing Activities for Abstract Topics That Foster Inquiry

10-12 Session

The reality is not every concept we teach has a realworld application, and we cannot create a three-act math task for every lesson. In this session, learn what essential elements are necessary for promoting inquiry and see what active learning looks like for abstract topics. Use the strategies presented to overhaul a current lecture-based lesson.

Jim Pardun

@JimPa23

Vernon Hills High School, Illinois

Walter E. Washington Convention Center, 140 AB

483

Exploring Student Thinking in Secondary Geometry through Lesson Study

8-10 Session

Through a university partnership, we collaborated on lesson study within a summer professional development project and during the school year. The lesson study focused on introducing proof in secondary geometry, a topic with many known challenges. We share the process we engaged in and what we learned about student thinking, and we discuss next steps.

Jenn Reed

Stanton Middle School, Wilmington, Delaware

Cheryl Cresci

Al Middle School, Wilmington, Delaware

Michelle Cirillo

Al Middle School, Wilmington, Delaware

Walter E. Washington Convention Center, Salon G

484 ISSUES

Getting Parents to Support Math Instruction in the 21st Century

Pre-K-2 Session

Tired of hearing parents complain about the "new math"? Ever had a parent undo what you've just taught by showing how "they" learned it? In this session, you will learn how to combat the fixed parent mindset and return to your classroom with strategies and resources to get your parents on board with 21st-century math instruction.

Hilary Kreisberg

@Dr_Kreisberg

Lesley University, Cambridge, Massachusetts

Matthew Beyranevand

Chelmsford Public Schools, Massachusetts

Marriott Marquis, Liberty Ballroom L (Level M4)

Don't miss **Ignite** at 6:00 p.m. on Friday, April 27, in Ballroom B (Walter E. Washington Convention Center). Hear from educators as they describe the teacher/teaching/ educator moment that significantly impacted them. A cash bar will also be available.















Help Me Out Coach! Collaboration for Student Success

Pre-K-2 Session

Participants will look inside K-2 classrooms to see the impact that side-by-side coaching and collaboration has on the development of number sense and mathematical reasoning. Math talks, selection of mathematical tasks, lesson debrief, analyzing student work to plan next steps, and collaboration will be highlighted through video clips.

Loria Allen

University of Alabama, Huntsville

Denise Porch

Arab City Schools, Alabama

Walter E. Washington Convention Center, 203 AB



Helping Students Succeed with Geometry through the Use of **Manipulatives**

6-8 Session

Do your students need some hands-on activities to help develop their understanding of geometry concepts? Discover the benefits of using manipulatives as well as some ways to use a variety of manipulatives for geometric topics, including area, volume, shape properties, transformations, and more!

Kevin Dykema

@kdykema

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Mattawan Middle School, Michigan

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

487 ISSUES

How Learning Progressions, Assessment, and Technology Can Support Students' Mathematical Sense Making

General Interest Session

Keeping students successfully engaged in mathematical sense making requires us to understand students' mathematical reasoning deeply enough to continuously choose tasks that engage them in successful mathematical sense making. I will illustrate how learning progressions, assessment, and technology can support this basic pedagogical premise.

Michael Battista

Ohio State University, Columbus

Walter E. Washington Convention Center, Salon I



Leadership: Bringing about Change— It's More Than Standards and PLCs

General Interest Session

Change requires attention to generating and articulating a shared (not necessarily identical) vision, ongoing generative conversations based on reflective thinking including the unpacking of beliefs, and addressing the complexity of school culture. We will examine plans, strategies, and tools to generate need for change and shared engagement.

Henry Kepner

Past President, National Council of Teachers of Mathematics, Reston, Virginia; University of Wisconsin-Milwaukee

Walter E. Washington Convention Center, Ballroom C



Learning Slope via Rate, Not Rote

6-8 Session

The concept of slope is a mystery to many students. Building a foundation for slope begins with a concrete understanding of rate, ratios, proportional relationships, and similarity. By introducing slope as a rate, particularly a unit rate, the real meaning and relevance of slope can emerge.

Stefanie Hassan

@slopelady

Great Minds, Oregon City, Oregon

Walter E. Washington Convention Center, 152 A











Lessons Learned: Taking Lesson Study to the Next Level

Coaches/Leaders/Teacher Educators Session

Let's move lesson study from being just an engaging activity to a system of improving classroom instruction throughout a school. We will look at how to identify a Problem of Practice, work with a lesson template to focus collaboration, and utilize a debriefing protocol to help teachers see themes beyond just the single lesson.

Melinda Griffin

Massachusetts Department of Elementary and Secondary Education, Malden

Walter E. Washington Convention Center, 102 AB



Lessons That Make Math Stick

General Interest Session

Ever wonder why so many math concepts do not stick with students? Come experience the structure of a sticky math lesson. Leave with lesson design tools that will make the math you teach stickier with your students.

Andrew Stadel

@mr stadel

Tustin Unified School District, California

Walter E. Washington Convention Center, Ballroom A

492 ASSESS

Making Mistakes Intentional: Analyzing Student Understanding with Low-Entry, **High-Ceiling Problems**

6-8 Session

Would you rather have questions students struggle to answer or answers that students struggle to question? Using depth of knowledge as our lens, we will ask openended problems to analyze student errors, differentiate misconceptions, and move beyond a limiting correct/ incorrect mindset, all while discussing how student thinking informs our teaching.

Jennifer McAleer

@jennifuhs4

The Carroll School, Lincoln, Massachusetts

Peter Morris

The Carroll School, Lincoln, Massachusetts

Walter E. Washington Convention Center, 154 AB

NCTM's Resources for the **Elementary Classroom**

3-5 Session

As busy teachers, it can be hard to find the best resources for your classroom. NCTM offers members a wealth of high-quality resources from apps and online games to lesson plans and complete lesson arcs. Come learn about NCTM's online Classroom Resources collections for the elementary classroom.

Graham Fletcher

@gfletchy

McDonough, Georgia

Monica Tienda

Key Elementary School, Detroit, Michigan

Marriott Marquis, Independence Ballroom F-H (Level M4)

494 TECH

Summarizing Mathematical Thinking with Student-Created Screencasts

General Interest Session

How can we tell students are processing mathematical concepts, while at the same time allowing opportunities to share thinking in an engaging way? Enter the student-created screencast! Using tablet and web-based tools, let's explore ways students can share thinking with their teachers, classmates, and even the world! Bring a tablet if you have one.

Beaverton School District, Oregon

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)











Take It to the Next Level: Strategies to **Increase Engagement and Collaboration** in a Math Classroom

10-12 Session

This presentation will focus on strategies and activities that can increase student engagement, collaboration, and learning in a math classroom. Participants will be introduced to ideas and resources that can easily be adapted and used in class. We will share experiences that have worked (and not worked) in our classrooms. Bring a device!

Kristen Fouss

@Fouss

Forest Hills School District, New Richmond, Ohio Benjamin Schulcz Blue Ash, Ohio

Walter E. Washington Convention Center, 145 AB



That's Not All Folks: Assessment That **Extends Learning**

8-10 Session

Too often students see the test as the end of their learning. Once they've taken the test, they think they can forget its content and material as they move on to a new topic. In other words, they have learned for the test, which means they really haven't learned enough. This session will provide a simple method of focusing on learning from the test.

Rita Barger

University of Missouri, Kansas City

Marriott Marguis, Independence Ballroom D (Level M4)

The Power of Connections: Deepening Place Value Understanding in K-2

Pre-K-2 Session

Students uncover big ideas about place value as they create varied models and discuss connections between them. Setting these experiences in problem contexts allows students to connect real to abstract and make sense of place-value concepts. Explore sample tasks and gather ideas for designing rich math experiences that highlight these connections.

Susan O'Connell

@SueOConnellMath

Quality Teacher Development, Millersville, Maryland

Walter E. Washington Convention Center, 146 B

498 **CCC**

Transforming How Transformations Are Taught to Provide Access for All **Students**

8-10 Session

We will share some innovative, ready-to-use activities that help students make sense of transformational geometry by using a guided discovery approach. We will also provide some useful tips on how to use Desmos to build your own activities that promote conceptual understanding through multiple representations and purposeful questions.

Alexandra Vatchkova

California State University, Northridge

Ivan Cheng

California State University, Northridge

Marriott Marquis, Liberty Ballroom M (Level M4)

499 ASSESS

Use an Open-Ended Sampling Challenge to Map Student Misunderstandings of **Population and Sample Size**

8-10 Session

Challenge your students to sample a population of their choosing-pick a population, make inferences, and document their work in social media—then watch what happens. Learn how to implement this simple challenge as a formative assessment, and how to use the results as a fun way to assess their statistical knowledge later.

Ariel Zych

y @arieloquent

Science Friday Initiative, New York, New York

Walter E. Washington Convention Center, 151 A













500 TECH

Using Applets to Engage Students in Your Statistics Course

10-12 Session

How do outliers affect regression lines? What does it mean to be 95 percent confident? What affects the shape of a sampling distribution? In this session, we will participate in several engaging activities and explore free online applets that help students visualize and understand statistical ideas.

Josh Tabor

Canyon del Oro High School, Tucson, Arizona Daren Starnes

The Lawrenceville School, New Jersey

Walter E. Washington Convention Center, Salon C

501 PROF

Utilizing Grade-Level Instructional Planning Meetings in Elementary Teacher Preparation

Higher Education Session

Join us to learn how we include grade-level instructional planning meetings in a field-based project for elementary preservice teachers. The meetings are an integral component in the process of developing and analyzing their implemented math lessons. We will share details about the project, the structure of the meetings, and resulting outcomes.

Temple Walkowiak

North Carolina State University, Raleigh

Amanda Gosek

North Carolina State University, Raleigh

Diane Hunter

North Carolina State University, Raleigh

Walter E. Washington Convention Center, 204 C

501.1 **CW** MODEL

Solving Word Problems Using the Bar Model Method

3-5 Exhibitor Workshop

The bar model method provides educators with effective approaches to solve multi-step word problems. Join us to learn the techniques of drawing and using bar models to solve complex real-life word problems commonly found in later levels of primary mathematics.

Shing Lee Publishers

Singapore

Walter E. Washington Convention Center, 143 C

501.2 **ew TECH HP Prime: Mathematics Education**

Technology on All Platforms!

10-12 Exhibitor Workshop

Get acquainted with HP Prime: the app-based, full-color graphing calculator. HP Prime is also available as software on Mac and PC as well as Android/iOS/Win10 phones/tablets. All versions have multi-touch, gesture-driven user interfaces (for example, pinch to zoom on a graph) and more. You'll receive a free copy of the software after the workshop.

HP, Inc.

San Diego, California

Walter E. Washington Convention Center, 159 AB

501.3 CW TECH

High School Closing the Gap: College & Career Readiness with MyMathLab

General Interest Exhibitor Workshop

Are your high school students ready for their next step in life? Whether these are your Calculus BC students, or those who need some more practice with algebra concepts, let's give them the tools they need to be successful. MyMathLab for School provides students with a personalized digital learning tool to prepare them for college, career, and life

Pearson Learning Services

Chandler, Arizona

Walter E. Washington Convention Center, 158 AB











501.4 CW ISSUES

TEALS— Teach Computer Science with Tech Industry Volunteers

10-12 Exhibitor Workshop

TEALS (Technology Education and Literacy in Schools) helps high schools throughout the U.S. build and grow sustainable computer science programs. In its proven program, TEALS pairs trained computer science professionals from across the technology industry with classroom teachers to team-teach computer science. Come learn more at this workshop!

TEALS/Microsoft Philanthropies

Redmond, Washington

Walter E. Washington Convention Center, 156

3:15 P.M.-4:30 P.M.

Are You Aligned? Analyzing Assessments

Coaches/Leaders/Teacher Educators Workshop

Rigorous goals, well-aligned classroom assessments, and high-quality feedback are keys to success. During this session, we review classroom assessments to determine alignment with the depth and rigor of the standard assessed. Additionally, we will analyze the feedback given to students on the assessments. Sample assessments will be provided.

Amy Youngblood

y@EduOptimus1

EduOptimus, Nixa, Missouri

Marriott Marquis, Marquis Ballroom Salon 3 (Level M2)

503 ASSESS

Assessment Planning for Secondary Mathematics Teachers: Aligning Curriculum and Assessment

10-12 Workshop

Aligning formative and summative assessment strategies with curriculum expectations is a key component to enacting a valid and reliable assessment system. Workshop participants will be taken through a process to build an assessment plan for either a course or a unit of study using *Understanding by Design* (Wiggins and McTighe 2006) as a framework.

Richelle Marynowski

y@rmarynow

University of Lethbridge, Alberta, Canada

Walter E. Washington Convention Center, 152 B

504 A&E

Becoming an Agent of Change! Learning to Teach Math with, for, and about Social Justice

3-5 Workshop

This workshop is for teachers who want to teach math more equitably but don't know where to start or how to keep growing. Participants will explore, define, and design experiences in order to teach math with, for, and about social justice. This will be done by exploring historical data, attendees' own stories, and freely available resources.

Joel Amidon

y@amidonplanet

University of Mississippi, Oxford

Anne Marshall

Lehman College, Bronx, New York

Becky Nance

Lehman College, Bronx, New York

Walter E. Washington Convention Center, 101













Bridging the Stats Gap in Algebra I with **Box & Whiskers Plots**

8-10 Workshop

Much of the foundation for statistics is introduced in grade 6 and not revisited until algebra I. In this session, we will scaffold through dot plots and box & whiskers plots to help students "bridge the gap" and make sense of measures of center and spread. We will also use hands-on, exploratory tasks to analyze, compare, and contrast data sets.

Jennifer Fillingim

Madison County Schools, Ridgeland, Mississippi

Walter E. Washington Convention Center, 143 AB

506 CCC



Coaching Teachers through the Process of High School Vertical Articulation

Coaches/Leaders/Teacher Educators Workshop

Do teachers look to you for guidance on which standards, topics or depth they should be teaching? How much would your teachers benefit from learning how to work collaboratively to make these decisions as a team? In this session, we will explore ways to develop teacher teams' abilities to interpret and vertically articulate the CCSS standards.

Cassie Sisemore

@cassiesisemore

Visalia Unified School District, California

Laurie Duerksen

Visalia Unified School District, California

Breanne Phillips

Visalia Unified School District, California

Walter E. Washington Convention Center, 149 AB

507

Designing Math Adventures

3-5 Workshop

Creativity is often lacking in the teaching and learning of mathematics. This interactive workshop uses design thinking methods to develop engaging, research-based lessons that involve both teachers and learners in the creative process. Participants will experience and design creative fraction/statistics lessons based on design thinking principles.

David Coffey

@delta dc

Grand Valley State University, Allendale, Michigan

Kathryn Coffey

Grand Valley State University, Allendale, Michigan

Walter E. Washington Convention Center, 150 B

508 TLC

Differentiation: How to Reach All Elementary Learners through a **Workshop Model**

3-5 Workshop

Through hands-on activities and video segments from teachers' classrooms, explore the way a Math Workshop Model can increase your ability to differentiate for all of your students. Participants will see how the Operation and Algebraic Thinking strand builds from kindergarten through fourth grade.

Jean Capper

UChicago STEM Education, Illinois

Rachel Muren

UChicago STEM Education, Illinois

Walter E. Washington Convention Center, 209 ABC











Elementary Math Travels: Seeing into the Future

Coaches/Leaders/Teacher Educators Workshop

Doing math is different than teaching math! We will share the details (the good, the bad, and the ugly) of a project that set out to improve mathematics instruction in our state. Working with multiple school districts and using a variety of resources, this was a journey of learning to ensure that ALL students learned and all teachers were supported!

Amy Weber-Salgo

@amysalgo

Making Math Equal, Reno, Nevada

Marissa McClish

Washoe County School District, Reno, Nevada

Jaci McCune

Washoe County School District, Reno, Nevada

Marriott Marquis, Marquis Ballroom Salon 4 (Level M2)

510 TLC

Experience-First Statistics: Exploring Statistical Inference through Activities

10-12 Workshop

Statistics is more important than ever, from CCSS to the redesigned ACT. For AP Statistics or any class wishing to do more stats, activities in this session will get at the essence of statistical inference. We will explore three such activities: interpreting confidence intervals, a "chisquare" test, and a test for a difference in proportions.

Jonathan Osters

@callmejosters

The Blake School, Minneapolis, Minnesota

Marriott Marquis, Capitol/Congress (Level M4)

Family Math Nights: 7 Ways to Connect Home and School

Coaches/Leaders/Teacher Educators Workshop

Family Math Nights are a great way to connect parents (or caregivers) and their child's school. Seven ways for organizing Family Math Nights will be shared along with sample games and activities. Mathematics content will be focused at the K-2 levels but this session is applicable to all elementary grades. Handout with games provided.

John Felling

Retired, Black Gold Regional Schools, Edmonton, Alberta, Canada Marriott Marquis, Marquis Ballroom Salon 7&8 (Level M2)

512 MODEL

Foraging for Food: Using Calculus to Model and Understand Animal Behavior

10-12 Workshop

We will develop a calculus-based model to make predictions about how animals behave when searching for food that is found in patches. Although obtaining food provides energy, searching for and capturing the food require both energy and time. Our model will answer the question "Should I stay or should I go?" from the animals' perspective.

Julie Graves

Deerfield Academy, Massachusetts; NCSSM, Durham, North Carolina

Walter E. Washington Convention Center, 103 A



Hands-On Geometry: Using Origami and **Compass Constructions for Advanced Explorations**

8-10 Workshop

We will present some novel origami and compass/ straightedge activities, with handouts available, for immediate use in the classroom. These are explorations that lead to generalizations or proofs but can be adapted to various levels. Participants are encouraged to attend if they teach geometry, precalculus, or math electives.

Brent Ferguson

The Lawrenceville School, New Jersey

Daniel Fishman

Montgomery High School, Skillman, New Jersey

Walter E. Washington Convention Center, 151 B













Harnessing the Power of Mathematical Models to Re-Envision Early Childhood Routines

Pre-K-2 Workshop

How do students' learn to reason abstractly and quantitatively in K-2? In our session, we will share two models (the bead string and the 100s frame) and specific ten-minute math routines that build big ideas in early number. We will also share video to illustrate how these concrete tools can become, over time, tools for students to think with.

Jennifer Costanzo

Metamorphosis TLC, New York, New York

Antonia Cameron

Metamorphosis TLC, New York, New York

Sonal Malpani

Metamorphosis TLC, New York, New York

Marriott Marquis, Marquis Ballroom Salon 9&10 (Level M2)

515 TLC

High-Yield Routines and Resources to Support Math Instruction

3-5 Workshop

Explore effective routines like number talks, 3-Act Tasks, Data Day, KenKen and more to enhance content knowledge and implement the PtA instructional practices. Learn about a plethora of digital resources through NCTM and elsewhere to support instruction regardless of your core program.

Regina Kilday

@MathLadyRI

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Metcalf Elementary School, Exeter, Rhode Island

Marriott Marquis, Liberty Ballroom I-K (Level M4)



Mathematics and Curiosity Magnified! Engaging in STEM with Primary Students

Pre-K-2 Workshop

Embrace students' natural curiosity with STEM lessons that integrate mathematics across subjects in your primary classroom to heighten student engagement. Participants will take part in hands-on STEM activities that transformed teachers' classroom culture to emphasize access and agency for all students.

Rebecca Lewis

@mathchic

Shasta County Office of Education, Redding, California

Walter E. Washington Convention Center, 201

517 TLC

Minute-to-Win-It Statistics

8-10 Workshop

In this workshop, participants will experience a highly engaging activity to build student understanding of z-scores and related statistics. Come ready to compete and win, and leave with an activity that will have your students ready to discuss, argue, and ultimately understand z-scores and their practical applications!

Karen Jones

Christiansburg High School, Montgomery County, Virginia Lisa Bissey

Eastern Montgomery High School, Montgomery County, Virginia Marriott Marquis, Independence Ballroom A-C (Level M4)

518 NEW T

New Teacher Celebration

General Interest Workshop

Come and celebrate the progress and possibilities as new and early career teachers, or as a teacher still in training. Meet and network with the NCTM Board and leadership and other new and early career teachers. We'll have refreshments and prizes, too!

David Barnes

National Council of Teachers of Mathematics, Reston, Virginia Walter E. Washington Convention Center, 202 B













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519

Once, Twice, Three Times the **Learning: Questioning & Conceptual** Understanding

10-12 Workshop

Learn three effective techniques to adapt tasks in order to increase access for all students and to enable students to acquire and demonstrate conceptual understanding. Practice using reversibility, flexibility, and generalization on our tasks, and then use them in rewriting a task of your own.

Kyle Eller

Wheaton Warrenville South High School, Illinois Frederick Dillon

Institute for Learning, Strongsville, Ohio

Walter E. Washington Convention Center, 206

520 1 TLC

Organizing an Interactive Family Math Night

Pre-K-2 Workshop

Looking for a way to get families excited about playing math games together? Come and learn about our format for an organized, hands-on night of math fun. We will share with you games and activities for all grade levels from K-3 and how we structure the night to be interactive for the whole family!

Heidi Hayes

@mathcoach10

Clinton Public Schools, Connecticut

Katherine Madura

Clinton Public Schools, Connecticut

Karen Pasiuk

Clinton Public Schools, Connecticut

Walter E. Washington Convention Center, 147 A

Power Mathematics with Amazing Connections to Literature! Your Students Will Beg for More!

3-5 Workshop

Experience powerful connections between meaningful mathematics and children's literature following NCTM's Principles to Actions! Participants will be actively engaged in "hands on" strategies for repeating and growth patterns, telling time, and money with many literature connections! A bibliography and a handout rich in ideas will be provided.

Kim Sutton

@Creative_Math

Creative Mathematics, Arcata, California

Walter E. Washington Convention Center, 207 B

522 1 TLC

Ratios with Cartons and Beans. Counters and Cups, Tables, Tape Diagrams, and Double Number Lines

6-8 Workshop

In this session, we will practice the use of manipulative models, tape diagrams, double number lines, ratio tables, and graphs with ELL students and those with math learning gaps as a way to model and solve a variety of ratio, rate, and percentage problems. You will compare and contrast representations, share experiences, and discuss options for teaching.

Will Johnston

American Institutes for Research, Washington, D.C.

Walter E. Washington Convention Center, 207 A













Sticky Situations: Investigating and Understanding the Common **Computation Situations Tables**

3-5 Workshop

How can we assist students in cognitively engaging in solving word problems? This session explores the structure of the Common Computation Situations (tables 1 and 2 in CCSSM) by interacting with various tools in processing the 24 situation subtypes. Participants will leave with ideas to help students truly understand the structure of math situations.

Deborah Thompson

@DThompsonMath

South Central Kansas Education Service Center, Clearwater Lynette Sharlow

Wichita School District, Kansas

Walter E. Washington Convention Center, Salon H

524 TLC



Teaching Logic & Proofs through Games & Number Theory: Variations on Nim

10-12 Workshop

How can we foster habits of mind and appreciation of mathematics through game play and proof writing? Variations on the game Nim teach the essentials of investigative discovery and metacognition. This multilayered puzzle allows multiple levels of entry and depth. This activity is one of several from a teacherdesigned inquiry-based proofs curriculum.

Andrea Kung

@akismetoo

Urban Academy Laboratory High School, Bronx, New York Gabriella Weisberg

Humanities Preparatory Academy, New York, New York

Marriott Marquis, Marquis Ballroom Salon 1&2 (Level M2)



The M in High School STEM

10-12 Workshop

New standards in math and science require students to think deeper about how concepts are applied to solving problems. This session is meant for teachers who don't know how to get started with STEM. Learn how to bring STEM into your high school math classes in ways that help engage and excite students.

Kelly Kutach

y∕@TIKellyK

Texas Instruments, Dallas, Texas

Marriott Marguis, Independence Ballroom E (Level M4)



The Power of Mathematical Models: **How to Build Multiplicative Reasoning** in Diverse Populations

3-5 Workshop

Multiplicative reasoning is the doorway to higher-level mathematics. For some students, this door is barred because they were asked to reason abstractly before they fully grasped these ideas in concrete ways. To provide access for these students, we advocate for using a concrete, dynamic mathematical model called the bead string.

Michael Cassaro

Metamorphosis Teaching Learning Communities, New York, New York

Ellen McCrum

Metamorphosis Teaching Learning Communities, New York, New York

Carrie Orgera

Metamorphosis Teaching Learning Communities, New York, New York

Walter E. Washington Convention Center, 204 AB

Thank you to the Annual Meeting Program Committee. Your time and dedication made this year's Annual Meeting a huge success!















We Got This! Engaging Students in **Equitable Group Collaboration with Challenging Mathematics**

8-10 Workshop

How do we engage students in collaborative groupwork? How do we equalize and broaden participation by all group members in the intellectual work of mathematics problem solving? In this hands-on workshop, we use Complex Instruction design principles to explore mathematical tasks and pedagogical strategies for engaging all students in groupwork.

Jennifer Eli

@jelimathed

University of Arizona, Tucson

Farshid Safi

University of Central Florida, Orlando

Walter E. Washington Convention Center, 144 ABC

4:30 P.M.-5:30 P.M.



A-B-C's and 1-2-3's of Infusing Literacy into the Mathematics Classroom

8-10 Session

Connecting math content and English language proficiency sets up ALL students for engagement and success in mathematics. Explore reading and writing strategies and walk away with tools and resources that increase both student literacy and numeracy.

Shawn Harris

@slgharris19

The College Board, Spokane, Washington

Adam Krupa

East Hartford Public Schools, Connecticut

Walter E. Washington Convention Center, 145 AB



Academic Talk: Students Processing and Growing Their Thinking and **Understanding Together**

Pre-K-2 Session

Talking, and listening to others talk about their thinking, helps all of us better understand and build on our thinking. In this session, three elementary educators will share strategies and examples of how young students learned to talk and listen in meaningful ways about mathematics.

Jennifer Orr

@jenorr

Lynbrook Elementary School, Springfield, Virginia

Anthony Ramakis

Fairfax County Public Schools, Virginia

Jessie Bagnall

Fairfax County Public Schools, Virginia

Marriott Marquis, Marquis Ballroom Salon 12&13 (Level M2)

530 A&E



Break the Cycle: Reframing Behaviors to Re-Engage Students in Learning **Mathematics**

6-8 Session

Students caught in a cycle of failure indirectly communicate their struggle with questions such as "When am I ever going to use this?" Come learn strategies that empower you to help students break free from this cycle as you identify common indicators and decide how to target your efforts to re-engage every student in active learning.

Jennifer Van Zante

@jenniferlmath

Math Solutions, Tualatin, Oregon

Nikki LaLonde

Math Solutions, Costa Mesa, California

Walter E. Washington Convention Center, 140 AB













160

531 TLC

Connecting the *Principles to Actions*Teaching Practices to the Principles of Learning Mathematics

General Interest Session

In this session, we will explore the three principles of how students learn math based on research from the National Research Council and connect these principles to the math teaching practices from *Principles to Actions*. Participants will look at classroom examples from K–5 and 6–12 and walk away with a tool for lesson planning based on the principles.

Elizabeth "Lisa" Hufstedler

@Hufstedler007

New Mexico State University/Las Cruces Public Schools Christine Woods

New Mexico State University/Las Cruces Public Schools

Marriott Marquis, Marquis Ballroom Salon 6 (Level M2)

532 A&E

Cultivating Math-Positive Parents: Passing the Growth Mindset on to Families

3-5 Session

Student-led family math nights, newsletters, parent conferences, and take-home lessons—all with a focus on the growth mindset—help families see that math is for everyone. The presenter, a math educator and mother of eight, shares creative approaches and humorous anecdotes that are sure to help you empower even the most math-phobic families.

Carrie Cutler

@DrCarrieCutlerUniversity of Houston, Texas

Marriott Marquis, Independence Ballroom F-H (Level M4)

533 PROF

Early Numeracy Partnerships: Exploring Professional Development to Enhance Early Numeracy

Pre-K-2 Session

This session will focus on the design and implementation of a professional development series to improve mathematics instruction in early learning. Learn how teachers have worked to purposefully plan for rich mathematical experiences and capitalize on the mathematical opportunities that routinely take place in early learning classrooms.

Amy Swinkels

@redswinks

Edmonton Catholic Schools, Alberta

Stephanie Power

Edmonton Catholic Schools, Alberta

Lynn McGarvey

Edmonton Catholic Schools, Alberta

Walter E. Washington Convention Center, 152 A

534 TLC

Eliciting and Using Student Thinking to Target the Other 7 Effective Teaching Practices

10-12 Session

By using student work as the center of classroom discussions, students have something to talk about and teachers know where to focus their questions. Rather than concentrating on only one practice at a time, this session will help teachers implement all of the teaching practices at once while simply paying attention to the last one on the list.

Janet Sutorius

Mathematics Vision Project, Nephi, Utah

Walter E. Washington Convention Center, 146 B



Don't miss the **Closing Session** on Saturday
afternoon with featured
speaker Francis Su,
Harvey Mudd College,
California.











535 TECH

Engaging English Language Learners in Mathematical Communication through Desmos® Technology

8-10 Session

The purpose of this presentation is to demonstrate the use of Polygraph, a program developed by the designers of Desmos* and how it can be used by English language learners (ELL). Consistent with mathematical tasks that go beyond merely memorizing vocabulary and pronunciations, Polygraph requires students to participate in mathematical discourse.

Joanne Caniglia

Kent State University, Ohio

Michelle Meadows

Tiffin University, Norwalk, Ohio

Walter E. Washington Convention Center, 146 C

536 A&E

From Counting to Calculus: All Students Are Mathematicians

General Interest Session

We tend to think of the work of calculus students as being very different from that of kindergarteners, but it really shouldn't be so. Furthermore, it has consequences for who has access to and participates in the field. All learners can function as mathematicians. We'll examine this claim through tasks and student ideas across the K–12 curriculum.

Christopher Danielson

y @trianglemancsd

Desmos, Inc., Saint Paul, Minnesota

Walter E. Washington Convention Center, Ballroom A

537 **CCC**

From Equal Groups to Proportional Reasoning: Multiplicative Comparison as the Key Structure

3-5 Session

Proportional reasoning is a major mathematical idea in middle grades. In this session, we will examine the role of multiplicative comparison in the progression from multiplication as equal groups in grade 3 to proportional reasoning in middle grades by examining some ideas from the Japanese elementary mathematics curriculum.

Tadanobu (Tad) Watanabe

Kennesaw State University, Georgia

Marriott Marquis, Liberty Ballroom M (Level M4)

538 TLC Improving Literacy in Geometry

6-8 Session

Improving literacy in geometry begins with an emphasis on understanding the vocabulary used. An effective way to achieve such understanding is through the use of hands-on activities. In order to give tangible meaning to geometric terms, a simple paper-folding activity will be used in the presentation illustrating over eighty terms and concepts.

Carroll Wells

Lipscomb University, Nashville, Tennessee

Walter E. Washington Convention Center, Salon C

539 TECH

Math Task Makeover with Desmos Activity Builder

8-10 Session

Transform your classroom lessons with three Activity Builder veterans who will share best practices for building effective, ongoing math experiences. Whether you've used Activity Builder many times, or you're new to the game, there will be something for everyone!

Bob Lochel

₩@bobloch

Hatboro-Horsham High School, Pennsylvania

Jedidiah Butler

Perris Union High School District, California

Michael Fenton

Perris Union High School District, California

Walter E. Washington Convention Center, 146 A











Meaningful Practices to Meet the Needs of Every Learner: It's about the Process

6-8 Session

"Everything I learned about teaching, I learned from teaching students with special needs."

How do we implement a challenging curriculum with high expectations for every learner? This session will explore methods and resources for making math accessible to all, specifically students with disabilities and emerging bilingual students.

Bridget Dunbar

y @BridgetDunbar

St. Mary's County Public Schools, Dameron, Maryland

Walter E. Washington Convention Center, 202 A

541 TLC

Metacognitive Journaling in Mathematics: Lessons from 20 Years of Student Writing

8-10 Session

Writing in math class can improve reflection and learning about problem solving. Teachers can maximize the benefits of metacognitive journals to include increased understanding of initial mistakes, solidified processes, and more student voice presence. Come see samples of journals and rubrics for assessment from a problem-based learning setting.

Carmel Schettino

y@SchettinoPBL

Avenues: The World School, Deerfield, Massachusetts

Walter E. Washington Convention Center, 204 C

542 ASSESS

More Than a Grading Method: How to Implement Standards-Based Grading in Your Math Classroom

8-10 Session

Beyond changing your grading scheme, successful implementation of standards-based grading requires a complete overhaul of your instructional practices. Based on observations from the field, this session will present strategies for successful implementation of standards-based grading in secondary mathematics classrooms.

Michelle Morgan

University of Northern Colorado, Greeley

Robert Powers

University of Northern Colorado, Greeley

Walter E. Washington Convention Center, 150 A

TLC Nurturing Inquiry in Your Calculus Class: Taylor Series

10-12 Session

Participants will be introduced to an inquiry framework for teaching mathematics, in the context of Taylor Series, that starts the learning conversation with generative questions. These questions are the inquiry seeds out of which grows lots of rich mathematical fruit, including patterns, theorems, and habits of mind.

John Millar

The Lawrenceville School, New Jersey

Brent Ferguson

The Lawrenceville School, New Jersey

Walter E. Washington Convention Center, 102 AB











Pathways through High School Mathematics: Let's Start the Conversation

8-12 Session

NCTM's Catalyzing Change lays out a set of Essential Concepts and suggests possible pathways for students. After a brief introduction to sample pathways, participants will interact to discuss, examine, and critique courses and organization structures that include the Essential Concepts and other courses to complete students' high school mathematics education.

Damarrio Holloway

Discovery High School, Lawrenceville, Georgia

Paul Kelley

Anoka High School, Minnesota

Ed Dickey

Retired, University of South Carolina, Columbia

Walter E. Washington Convention Center, 147 B

545 A&E

Promoting Algebraic Thinking through Visual Pattern Tasks for English Language Learners

6-8 Session

Motivate English learners in algebraic reasoning by fostering productive struggle, language development, and exploring visual pattern tasks. Participants will anticipate the ways students will solve pattern tasks, consider how to support students' learning without taking over the thinking for them, and interrelate social and analytic scaffolding.

Jose Francisco Sala Garcia

™@JoseFSala

IES Santa Maria d'Eivissa, Ibiza, Spain

Walter E. Washington Convention Center, 203 AB

546



Reimagining Math Class through the **Lens of Neurodiversity**

General Interest Session

Advances in brain research are rapidly changing mathematics instruction, but they are also having a profound impact on special education. Learn about emerging ideas, such as neurodiversity, that will shift your understanding of special education and disability. Leave with tools that will help enact these paradigm shifts in your math class.

Andrew Gael

@bkdidact

Cooke Center Academy, New York, New York

Rachel Lambert

Chapman University, Orange, California

Walter E. Washington Convention Center, Ballroom B

MODEL

Reinventing Algebra I in a Common Core World

8-10 Session

The Common Core has done little to improve the high school math curriculum, especially for algebra I, which seems mostly unchanged from decades past. This session will discuss a realistic algebra I scope and sequence, a plethora of engaging modeling tasks, and technology apps that can engage and assess students throughout such modeling tasks.

Eric Milou

❤️@drMi

Rowan University, Glassboro, New Jersey

Walter E. Washington Convention Center, 154 AB











548 TLC

Self-Paced Flipped Model: A Twist on Flipped Classroom

10-12 Session

This presentation encourages people to amend the usual method for a flipped classroom. We will explain why our self-paced twist on flipped classroom is changing how students learn and provide information for this method. Our units consist of target dates, stations, and applications that are done within our classroom, and we will provide an example unit.

Kyle Wilhelm

Lake Forest High School, Illinois

Shelly Lindsey

Lake Forest High School, Illinois

Marriott Marquis, Independence Ballroom D (Level M4)

549



Standard(s) Statistics: Exploring Common Core Statistics Content

6-8 Session

Explore middle and high school statistics content with hands-on and cognitively-demanding activities. Engage in mathematical practices while exploring center and distribution for univariate and bivariate data. Consider how these and similar activities advance students' abilities to answer statistical questions through statistical problem solving.

Jonathan Watkins

University of Louisville, Kentucky

Susan Peters

University of Louisville, Kentucky

Marriott Marquis, Marquis Ballroom Salon 14 (Level M2)

550



Tasks and Talk That Promote Argumentation with Young Learners

Pre-K-2 Session

Do your primary students engage in mathematical argumentation? Explore tasks and talk that support students to construct viable arguments and critique the reasoning of others. Leave with ideas you can implement in your classroom tomorrow, including tasks, routines, and talk structures.

Jody Guarino

j@jody_guarino

Orange County Department of Education, Costa Mesa, California Chepina Rumsey

University of Northern Iowa, Cedar Falls

Marriott Marquis, Liberty Ballroom L (Level M4)

551 CCC

The High School Coherence Map: A Tool to Align Curriculum, Standards, and Student Outcomes

10-12 Session

We introduce a free resource, the High School Coherence Map, designed to dynamically represent the connections between multiple CCSS standards across conceptual categories. This fast-paced, examples-laden presentation will highlight how participants can use the Coherence Map to design pathways toward college and career readiness.

Luis Lima

⊌@lima271828

UnboundEd, Baltimore, Maryland

Steve Sebelski

UnboundEd, New York, New York

Doug Sovde

UnboundEd, New York, New York

Marriott Marquis, Marquis Ballroom Salon 5 (Level M2)













552 CCC

The intersection of NGSS and Common Core: Lessons Learned from a Yearlong Study

3-5 Session

We just completed a grant project that integrated NGSS and Common Core in grades 3–5. We will share the fully integrated activities, as well as tips and strategies for successful implementation. Participants will leave with research-based, integrated activities to try in their classrooms.

Adam Goldberg

@ProfG SCSU

Southern Connecticut State University, New Haven

Maria Diamantis

Southern Connecticut State University, New Haven

Walter E. Washington Convention Center, Salon I

553 A&E



The Positive Counternarrative: White Women Successfully Teach Math to African American Boys

Coaches/Leaders/Teacher Educators Session

In this session, you will hear the voices of young African American men who succeeded in their K-12 mathematical experiences. The focus of the session will be on their early positive experiences with white women as their math teachers. Participants will be given the opportunity to discuss and reflect on the lessons we can learn from their stories.

Sara Cutler

SEAMS Consulting, Madison, Wisconsin

Sarah Lord

University of Wisconsin–Madison

Walter E. Washington Convention Center, 103 B



The Power of Writing about **Mathematical Thinking**

3-5 Session

How can writing support students' mathematical thinking? How can what we know about teaching writing and facilitating number talks help us develop a community of math writers? Along with these questions, we will consider different purposes of writing about math, several engaging teaching strategies, and samples of students' work.

Linda Dacey

@LindaSDacey

Lesley University, Waltham, Massachusetts

Walter E. Washington Convention Center, 151 A

555 ISSUES

Three Words I Have Never Heard in a Math Classroom

General Interest Session

Certain phrases have power to unlock math, yet they seem rare in classrooms. Which of them do you use in your teaching? Which ones might you try using after this talk? We'll consider several of these powerful phrases and examine how they open up aspects of math that too often go without saying.

Jason Zimba

Student Achievement Partners, New York, New York

Walter E. Washington Convention Center, Ballroom C

556 ISSUES

Ungraded: Redefining the Way We Communicate Learning and **Competency in the Math Classroom**

General Interest Session

Teachers, students, and parents want a more meaningful way of communicating authentic learning. Research has proven that grades and test scores demotivate students, particularly in math where students often develop a fixed sense of their abilities. Hear from a middle school prealgebra teacher who replaced grades with meaningful feedback.

Robyn Wise

@WiseMath McLean

McLean School, Potomac, Maryland

Walter E. Washington Convention Center, Salon G











Crazy 8s Afterschool Club: Get Kids Fired Up About Math!

Pre-K-2 Exhibitor Workshop

Crazy 8s is a high-energy after-school club for K–5 kids with off-the-wall activities like Glow-in-the-Dark Geometry and Toilet Paper Olympics. Bedtime Math provides free kits, including directions and materials. Schools provide a coach and minimal additional supplies. Workshop participants will get hands-on experience running the club's activities.

Bedtime Math Foundation

Summit, New Jersey

Walter E. Washington Convention Center, 156

556.2 **ew** ccc

Teaching Math Just Got a Whole Lot Easier: Take the Guesswork out of Teaching Algebra and Geometry

8-10 Exhibitor Workshop

Kirk Weiler will take you on a tour of eMathInstruction's natural curricular progression that touches on all Common Core standards as well as the tools that make eMath easy to use. eMath is engaging students in math like never before on YouTube and social media. Each attendee will receive a \$150 eMath subscription to the course of their choice.

eMath Instruction, Inc. Red Hook, New York

Walter E. Washington Convention Center, 143 C

556,3 **EW** TLC

Ready, Set, Go with Math Workshop! How to Engage Students without Getting Overwhelmed

Pre-K-2 Exhibitor Workshop

Curious about math workshop, guided math, or small-group math instruction? Learn how it can transform K–5 math instruction, and help you reach all learners and keep them engaged. Learn tips, tricks, and concrete ideas for getting started with math workshop. Attendees will leave with a complete, classroom-ready lesson that can be used immediately.

Carson-Dellosa Publishing Co.

Greensboro, North Carolina

Walter E. Washington Convention Center, 158 AB

556.4 **EW** TECH

Geometry Class + Technology: Real Talk

10-12 Exhibitor Workshop

Technology is here to stay, but what does this mean for geometry classes today? Join our panel featuring early adopters of digital products who have experienced the good, bad, and ugly . . . and still have their graphing calculator from high school. These teachers will share content resources they love, implementation strategies, and "lessons learned."

CanFigureIt

New York, New York

Walter E. Washington Convention Center, 159 AB

6:00 P.M.-7:00 P.M.

557

Ignite! We'll Enlighten You and We'll Make It Quick

General Interest Session

Hear from eight mathematics educators as they describe the teacher/teaching/educator moment that significantly impacted them. The challenge is that each speaker will get five minutes to talk, using twenty slides that auto advance every fifteen seconds whether they're ready or not. Matt Larson will emcee this exciting event! A cash bar will also be available.

Matt Larson

President, National Council of Teachers of Mathematics, Reston, Virginia; Lincoln Public Schools, Nebraska

Laila Nur

LAUSD, Los Angeles, California

Timothy Kanold

Loyola University Chicago, Illinois

Greg Tang

GregTangMath.com, Belmont, Massachusetts

Robert Berry, III

President-Elect, National Council of Teachers of Mathematics, Reston, Virginia; University of Virginia, Charlottesville

Diane Briars

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Consultant, Pittsburgh, Pennsylvania

Juli Dixon

University of Central Florida, Orlando

Lucy West

Metamorphosis Teaching Learning Communities, New York, New York

Paul Kelley

Anoka High School, Minnesota

Walter E. Washington Convention Center, Ballroom B













PREMIER MATH EDUCATION EVENTS

Innovate. Collaborate. Learn.

NCTM Regional Conferences & Expositions are an opportunity to share knowledge and learn with leaders in the field of mathematics education. Gain new strategies to unleash the mathematical mind of every student when you take advantage of superior math resources right on your doorstep.

What you'll get:

- Innovative ideas you can immediately put to use
- Updates on classroom best practices from recognized innovators
- In-depth discussion about the latest education resources
- Knowledge sharing with like-minded peers
- Interaction with the latest tools and products in the robust exhibit hall





- Pre-K-Grade 12 classroom teachers
- Math coaches
- Administrators
- Math teacher educators
- Preservice teachers
- Math specialists

Join NCTM in Hartford, Kansas City, or Seattle and discover the tools that will help you promote the mathematical habits of mind that will lead your students to college and career success.



Learn more at nctm.org/regionals and follow us on







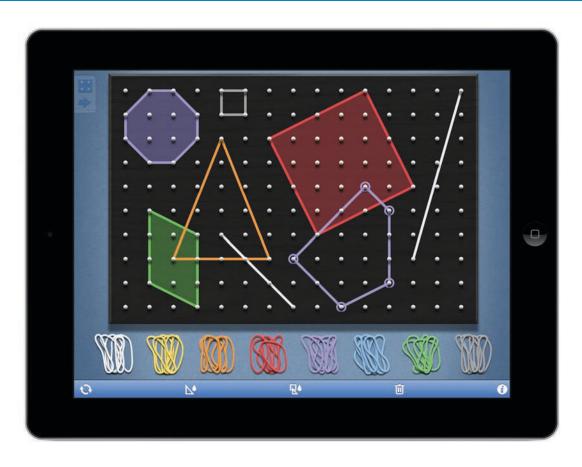




Saturday

Enter to Win an iPad

from the Math learning Center



Enter in 3 easy steps:

- 1. Stop by booth #241
- 2. Learn about our apps
- 3. Let us scan your badge

Consumer Disclosure: You have not yet won. No purchase or payment of any kind to The Math Learning Center is necessary to enter or win. The approximate retail value of the prize is USD \$329.00. The odds of winning depend on the number of eligible entries received. One entry per person. Other restrictions apply. Promotion Entry Period: begins on Thursday, April 26, 2018 at 08:00 a.m. Eastern Time and ends on Saturday, April 28, 2018 at 12:00 p.m. Eastern Time. Sponsor: The Math Learning Center, 1850 Oxford Street SE, Salem, Oregon 97302; PO Box 12929, Salem, Oregon 97309-0929.





PREMIER MATH EDUCATION EVENT

NCTM ANNUAL MEETING & EXPOSITION 2019 April 3-6 | San Diego



Empowering the Mathematics Community

It's never too early to plan ahead for the leading math education event of the year. Network with thousands of your peers and fellow math education professionals to exchange ideas, engage with innovation in the field, and discover new learning practices that will drive student success.

The latest teaching trends and topics will include:

- Assessment: Eliciting and Using Student Thinking
- **Building on Students' Strengths:** Practices That Challenge, Engage, and Empower
- Professionalism and Advocacy
- Beyond the Classroom Walls: Empowerment, Access, and Equity
- **Creating Inclusive Classrooms:** Meeting the Needs of Each and Every Student
- Building Mathematical Knowledge for Teaching
- Enhancing Mathematical Thinking through Reading, Writing, Speaking, and Listening
- For the Love and Joy of Mathematics

The NCTM Annual Meeting & Exposition is ideal for:

- PRE-K-12 TEACHERS
- MATH TEACHER EDUCATORS
- NEW AND PROSPECTIVE TEACHERS
- MATH COACHES AND SPECIALISTS
- MATH RESEARCHERS
- SCHOOL AND DISTRICT ADMINISTRATORS

Saturday Planner



HIGHLIGHTS

San Francisco Detracked Math in 2014—The Results Are Starting to Come In, 571

Closing Keynote: Mathematics for Human Flourishing, 664

GET SOCIAL

Stay informed and get connected with attendees by using #NCTMannual on social media.







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Instagram @NCTM.math



facebook.com/TeachersofMathematics

REGISTRATION HOURS

7:00 a.m.-11:00 a.m.

EXHIBIT HOURS

8:00 a.m.-Noon

NCTM CENTRAL HOURS

8:00 a.m.-Noon

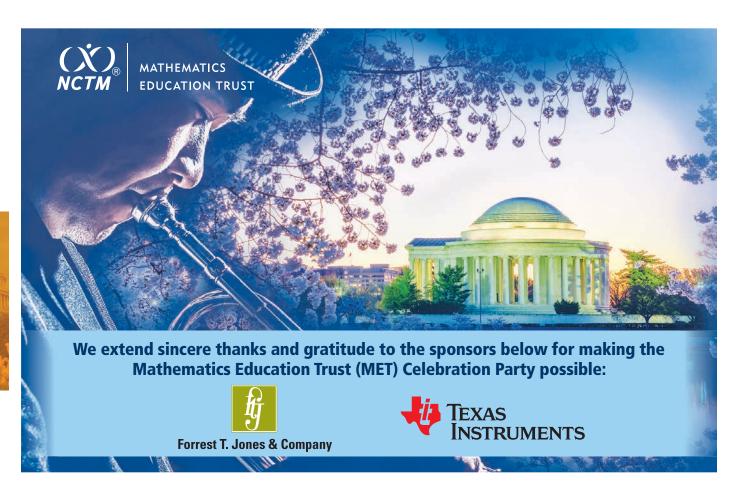
FIRE CODES

We have made every attempt to provide adequate seating for participants at the conference, but for your safety and because of fire regulations, only those with seats will be allowed in meeting rooms. To comply with fire codes, we will have to ask persons sitting on the floor or standing to leave the room.

Networking Lounge: Presentation Area	
9:00 a.m.– 9:20 a.m.	NCTM Session Professional Development Resources Professional Development Services Committee (PDSC)
9:30 a.m.– 9:50 a.m.	Author Talk Taking Action:Implementing Effective Teaching Practices in Grades 6–8* Michael Steele
10:00 a.m.– 10:20 a.m.	NCTM Session Understanding Your NCTM Membership MARC Committee
10:30 a.m.– 10:50 a.m.	Session Picture Books for Middle School Math Kevin Dykema
11:00 a.m.– 11:20 a.m.	Author Talk Taking Action: Implementing Effective Teaching Practices in Grades K–5* DeAnn Huinker and Victoria Bill
11:30 a.m.– 11:50 a.m.	NCTM Session Catalyzing Change: Math and Modeling Dan Teague

^{*} Author will be available after talk for book signing

Networking Lounge: Math Circles	
9:00 a.m.– 10:30 a.m.	An Ancient Babylonian Math Mystery Bob Sachs and Nathan Borchelt
11:00 a.m.– 12:30 p.m.	Spot It! Joshua Zucker













8 Ways to Create a Legendary Math

General Interest Session

Ever get the sense that math class is last to the party when it comes to change? That modern-day Ferris Buellers are scheming to avoid algebra class across the nation because class is stifling and irrelevant? Learn eight ways to evolve a traditional class into a modern class rooted in deeper learning, and well, fun. Make your class legendary.

John Berray

@johnberray

Grossmont Union High School District, La Mesa, California

Walter E. Washington Convention Center, Ballroom B Reflection Cove following presentation.



Bringing Parents to the Table

General Interest Session

With all the work we do to improve the educational experience for our students, enhance our classrooms, and take risks, we often forget our most useful allies: parents. In this session, we will discuss ways in which we can bring parents to the table as a way of supporting the development of their child(ren). Leave with ideas, resources, and more.

john stevens

@jstevens009

CJUHSD, Ontario, California

Walter E. Washington Convention Center, Ballroom C

560 TLC Ruilding Mat

Building Mathematical Understanding through Meaningful Discussions

Pre-K-2 Session

Do you engage your students in mathematical discussions? Want to ensure students make progress toward learning goals? This session will use student work and explore ways to select and sequence student strategies and pose purposeful questions to develop key mathematical ideas.

Vanessa Cerrahoglu

y@mymathsoul

Orange County Department of Education, Costa Mesa, California **Jody Guarino**

Orange County Department of Education, Costa Mesa, California
Walter E. Washington Convention Center, 203 AB

561 PR

Changing the Face of Professional Development Voluntarily

3-5 Session

Professional development is changing; one form is volunteerism in studying math content and pedagogy related to current work. An example is Saturday Academy for Mathematics (SA4M) organized in Oxford, Mississippi. How to set up an academy, how to manage it, and how to encourage teachers as learners will be discussed. The focus of SA4M is for K-4 teachers.

Johnny Lott

Past President, National Council of Teachers of Mathematics, Reston, Virginia; Oxford, Mississippi

Brian Buckhalter

Oxford School District, Mississippi

Walter E. Washington Convention Center, 146 A

563 MODEL

Creating Mathemacitizens: Building Piecewise-Defined Functions to Analyze Public Policy

10-12 Session

Come experience a precalculus activity that guides students to create piecewise-defined function models for analyzing the federal tax structure of the U.S. and the economic incentives offered to low-income citizens through the Earned Income Tax Credit. The models help students become informed citizens who can debate ways to improve tax policies.

Forrest Hinton

North Carolina School of Science and Mathematics, Durham

Walter E. Washington Convention Center, 152 A











Discover the New GeoGebra Graphing Calculator and Geometry Apps

8-10 Session

Join this session to discover the new beautifully simple and powerful GeoGebra Graphing Calculator and Geometry apps with their many capabilities to foster student-centered and discovery-based learning. We will show classroom-tested activities for function graphing, equation solving, and geometry in high school. Bring your own device!

Markus Hohenwarter

Johannes Kepler University Linz, Austria

Walter E. Washington Convention Center, 102 AB

565 TECH

Dynamic Algebra Notations: Letting Students Apply Algebra before They Mastered the Rules

6-8 Session

We don't want drill-and-kill practice of algebra rules, but how can students use algebra in open problem solving before they master the rules? An answer to this conundrum are dynamic algebra notations. Different from paper, they enforce the rules so students can explore strategies, flexible procedures, and application from the very beginning.

Erik Weitnauer

Graspable Inc., Bloomington, Indiana **David Landy**

IUB, Bloomington, Indiana

Walter E. Washington Convention Center, 150 A

566 TLC Engaging Students throu

Engaging Students through a Personalized Experience

8-10 Session

The traditional mathematics classroom sees the teacher at the center, and the students often disengaged in their learning. In this session, we will explore one way to design your classroom so that students work at their own pace, participate in meaningful discourse to solve problems, and use timely and accessible feedback to further their learning.

Kristy McGowan

y@MathwithGowie

Holy Trinity School, Richmond Hill, Ontario, Canada Christine Lovrics

Holy Trinity School, Richmond Hill, Ontario, Canada

Walter E. Washington Convention Center, 146 C

567 TECH

Integrating Dynamic Representational Technology into a Meaningful and Coherent Approach to Teaching

6-8 Session

Representation-rich technology can change the way math is taught and learned, providing today's diverse student population access to deep conceptual understanding. In this session we will explore what it means to go beyond using this technology as an occasional "field trip," and instead create a coherent and meaningful math class.

Philip Vahey

SRI Education, Menlo Park, California

Walter E. Washington Convention Center, 202 A



Bring Focus to your High School Mathematics Curriculum. Now Available! *Catalyzing Change in High School Mathematics: Initiating Critical Conversations*. Get your copy now in the **NCTM Bookstore**.











568 CCC

It's All in the Name: Exploring the Power of Naming a Course "Proportional Reasoning"

6-8 Session

There is power in a name. Algebra. Geometry. Trigonometry. They all evoke a categorization of problem types. But what about prealgebra? This session will provide a case for renaming "prealgebra" as "proportional reasoning." This pivotal concept will be examined through the lens of the grades 6-8 CCSSM and focus on curriculum connections.

Deana Deichert

Montgomery County Community College, Pottstown, Pennsylvania

Mercedes Sotillo

Full Sail University, Orlando, Florida

Walter E. Washington Convention Center, 140 AB

569 CHANGE MODEL

Modeling for Motivation and Proof for Power

8-12 Session

Modeling and proof are highlighted in Catalyzing Change as ways to enhance essential concepts across content areas where students can see themselves as capable of doing meaningful mathematics and statistics. We give examples of how modeling and proof can be used to empower students to think and use tools that have learned in new contexts.

Daniel Teague

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; North Carolina School of Science and Mathematics, Durham

Walter E. Washington Convention Center, 145 AB

Not Just a Guess: K-2 Estimation **Experiences**

Pre-K-2 Session

The ability to estimate is a key part of number sense and can serve as a predictor of future math success. How can we help our students develop this skill in the early grades? Come learn how you can move your students beyond just guessing by incorporating short and powerful estimation experiences into your math routines.

Maria Peneda

The Cathedral School of Saint John the Divine, New York, New York

Yojairy Sands

The Cathedral School of Saint John the Divine, New York, New York

Walter E. Washington Convention Center, 147 B

571

San Francisco Detracked Math in 2014— The Results Are Starting to Come In

10-12 Session

In 2014 San Francisco Unified School District detracked math through high school geometry. This initiative was much more than a policy change; this transformation included new curricula, extensive coaching, a public awareness campaign, and extended professional development. Early indicators of progress are starting to come in and they are positive!

Jim Ryan

San Francisco Unified School District, California

Walter E. Washington Convention Center, Salon C

572 A&E

Students with Exceptional **Mathematical Promise Deserve Differentiation, Too**

General Interest Session

The NCTM position statement on Providing Opportunities for Students with Exceptional Mathematical Promise notes the importance of careful consideration of acceleration as well as engaging, differentiated experiences. Come explore these issues and investigate proven strategies and resources that develop mathematical passion, talent, and creativity.

Linda Sheffield

Emerita, Northern Kentucky University, Highland Heights

Walter E. Washington Convention Center, Salon I











573 A&E

Talk Number to Me: The Ratio Table

3-5 Session

The ratio table is a powerful tool for students to shift from additive thinking to multiplicative, master the distributive property, partial products/quotients, and proportional reasoning by exploring multiplication/division/fraction real world problems, crafting multiple solutions within contexts, and providing proofs of students' own thinking.

Christina Lincoln-Moore

@virtuouscm

LAUSD, California Mathematics Council-South, Los Angeles

Walter E. Washington Convention Center, 103 B

574 A&E

The Learning Tree: A Mathematics Tracking Simulation

General Interest Session

This session will engage participants in a tracking simulation to highlight the connection between students' placement in mathematics classrooms and their opportunities to learn. Participants will share their classroom experiences as we discuss ways to provide equitable opportunities for all students to study and achieve in mathematics.

Dorothy White

University of Georgia, Athens; Benjamin Banneker Association Kanita DuCloux

University of Western Kentucky, Bowling Green; Benjamin Banneker Association

Walter E. Washington Convention Center, Ballroom A Reflection Cove following presentation.

575 A&E

Through the Looking Glass—Using Literature as Windows into Equity in Early Mathematics

Pre-K-2 Session

Learning requires connections to prior experiences, yet students from underrepresented populations are more likely to experience tasks that are disconnected to their daily lives. In this session, participants will explore culturally rich children's literature and identify opportunities to develop rigorous tasks that align to pre-K–2 math standards.

Cynthia Taylor

Millersville University of Pennsylvania

Kelley Buchheister

University of Nebraska-Lincoln

Christa Jackson

University of Nebraska-Lincoln

Walter E. Washington Convention Center, 151 A

Reflection Cove following presentation.

576 TLC

Using Anchor Tasks to Engage Learners: Deepening Understanding through Exploration and Discourse

3-5 Session

Participants will engage in active math lessons and learn how to use learning objectives to create anchor tasks that spark student interest and allow students of all levels to build on prior knowledge, explore concepts with concrete materials and engage in productive discourse to deepen conceptual understanding with a focus on problem solving.

Beth Curran

Math Champions, Ruckersville, Virginia

Cassandra Turner

Math Champions, Fort Collins, Colorado

Walter E. Washington Convention Center, 146 B











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577 A&E

Using Large-Scale International Studies to Understand Math Education Equity within a Local Context

Coaches/Leaders/Teacher Educators Session

The speakers use the results of large-scale international studies (TIMSS and PISA) to shape their actions affecting equity in mathematics education at a low performing high poverty urban high school. Participants will consider how their own unique situations may benefit by better understanding the results of the most recent international data.

Susan Holloway

Aurora Public Schools, Colorado

Katie Law-Balding

Aurora Public Schools, Colorado

Walter E. Washington Convention Center, 204 C

578 TECH

Using Virtual Co-Teaching to Support Algebra Teachers

8-10 Session

Co-teaching is an instructional model where two teachers share responsibilities of teaching all students. Participants will learn how algebra teachers are using standards-based instructional videos and other online resources as virtual co-teachers to support student learning, both in and out of the classroom.

Joy Schackow

y@joys31999

University of Florida, Gainesville

Walter E. Washington Convention Center, 154 AB

578.1 EW MODEL

The Mathematics Behind a Zombie Apocalypse

10-12 Exhibitor Workshop

A zombie "virus" is spreading—people are turning into zombies! Will you be the next victim? Use math to model the spread of the virus through a population. Learn how to weave science concepts into your next lesson about exponential and logistic growth. (No zombies will be harmed in this session.)

Texas Instruments

Dallas, Texas

Walter E. Washington Convention Center, 158 AB

578.2 **ew** ccc

Using Visualization and Decomposition Strategies to Develop Facts Fluency in the Early Grades

Pre-K-2 Exhibitor Workshop

Common Core requires students to learn mental strategies and properties of operations to develop fluency with addition and subtraction facts. Bill Jackson and Tricia Salerno will show how to use ten-frame cards and Singapore math methods to help students visualize quantitative relationships, use decomposition strategies, and develop number sense.

Singapore Math, Inc.

Tualatin, Oregon

Walter E. Washington Convention Center, 156

578.3 **EW** TECH

Promoting Success on the AP® Exam with *The Practice of Statistics*

10-12 Exhibitor Workshop

The AP® Statistics exam is less than a month away. How can you use *The Practice of Statistics* to help students succeed on the AP® exam? In this session, authors Daren Starnes and Josh Tabor will discuss specific exam-preparation resources from TPS 6e and 5e, including exam tips and common errors, flash cards, FRAPPYs, and the Strive for a 5 Guide.

Bedford, Freeman & Worth Publishers

Hamilton, New Jersey

Walter E. Washington Convention Center, 159 AB











8:00 A.M.-9:15 A.M.

579 TLC

Creating a Thinking High School Classroom and Fostering Mathematical Discourse—Let's Talk about It!

8-10 Workshop

Rich mathematical conversations with high school students are possible! Beyond the "show and tell" or the separate presentation of solutions, we will explore and compare different discussion "moves" to enable every student to draw connections between their solution and other student's solutions as well as key mathematical ideas.

Jules Bonin-Ducharme

@jboninducharme CFORP, Ottawa, Ontario, Canada

Walter E. Washington Convention Center, 152 B

580 A&E

Differentiate in 3D: Meet Middle School Students' Readiness, Interest, and Learning Preference Needs

6-8 Workshop

Good differentiation in mathematics does not replicate tracking within the classroom, focus on fluff without substance, or resemble a three-ring circus. Examples from real classrooms will illustrate how discovering and attending to student readiness, interest, and learning preference can promote growth, reveal hidden talent, and increase motivation.

Kristina Doubet

y@kjdoubet

James Madison University, Harrisonburg, Virginia

Walter E. Washington Convention Center, 150 B

581 TLC

Engage Student Learning with Demanding Fraction Tasks That Promote Discourse and Feedback

3-5 Workshop

In classrooms designed for learning, student engagement increases when presented with cognitively demanding tasks, rich discourse, and meaningful feedback from peers and teachers. Participants solve cognitively demanding tasks, examine student work to identify understandings and misconceptions and identify feedback to increase student engagement.

Sandra Niemiera

Concordia University Chicago, River Forest, Illinois Elizabeth Cape University of Illinois at Chicago

Jennifer Leimberer

University of Illinois at Chicago

Walter E. Washington Convention Center, 144 ABC

582 TLC

Experience First, Formalize Later: Using Introductory Activities to Teach Statistics

10-12 Workshop

Make statistics engaging and accessible to your students! In this session, we outline our lesson format in which students experience and engage in statistics BEFORE instruction. Begin every lesson with a student-driven, introductory activity which can be layered with formalized content and provides students with a meaningful context for learning.

Lindsey Gallas

East Kentwood High School, Michigan **Luke Wilcox**

East Kentwood High School, Michigan

Walter E. Washington Convention Center, 202 B











8:00 A.M.-9:15 A.M.



Hanging Out on a Number Line: You're on the Spot!

3-5 Workshop

Get up and move as you physically demonstrate your understanding of numbers, operations, and algebraic reasoning. This powerful workshop helps students see and feel position on a number line. Number sense and reasoning are needed to locate your spot. Answer the following: The endpoints are 3/4 and 1 3/4. Where are you located if you are 1 1/3?

Laurie Boswell

Consultant, Franconia, New Hampshire

Walter E. Washington Convention Center, 151 B



Laying the Foundation for Students' **Understanding of Areas of Triangles** and Quadrilaterals

6-8 Workshop

Learn meaningful ways to introduce various area concepts and formulas to your students. You will complete activities that help you discover how to build on students' prior understanding while incorporating the moving and additivity properties of area to derive formulas for rectangles, parallelograms, triangles, and trapezoids.

Erin Moss

Millersville University of Pennsylvania

Walter E. Washington Convention Center, 209 ABC

585 A&E



Let Me Show You How I Do It

Coaches/Leaders/Teacher Educators Workshop

Student engagement is foundational to the pursuit of equity. In this session, learn how creating authentic opportunities for students to engage with middle and high school mathematics through writing will transform your classroom culture and professional practice.

Brea Ratliff

@brea_ratliff

Me to the Power of Three, LLC, Heartland, Texas

Crystal Morgan

Dallas Independent School District, Texas

Walter E. Washington Convention Center, Salon H



Lifting Up Student Voice: Mathography Writing and Teacher Moves

10-12 Workshop

How can we invite student voices into our classrooms? Mathographies provide teachers with a window into student identity along with actionable knowledge for supporting diverse classrooms. We will tell our own math stories, review research and sample tasks, and use student work to develop strategies for enacting responsive teacher practices.

Emma Gargroetzi

Stanford University, California

Wendy Menard

Midwood High School, Brooklyn, New York

Walter E. Washington Convention Center, 206

587 MODEL

Modeling: Teaching It Right & Making It Work!

10-12 Workshop

Modeling, if taught correctly, is one of the most effective tools in student learning. It requires creating "scenarios" that "beg" a problem-solving situation and just the right amount of teacher guidance for students to be successful. Learn, hands-on, the nuts-and-bolts of creating, using, and teaching with models that truly help students learn.

David Ewing

University of Central Missouri, Warrensburg

Walter E. Washington Convention Center, 143 AB

Math Talks: Adapting the Number Talks Structure for Secondary Mathematics Classrooms

6-8 Workshop

How can effective number talk routines be adapted to meet the needs of secondary classrooms? Explore strategies and resources for implementing math talks in grade 6 algebra. See how math talks can provide opportunities for students to communicate and justify mathematical ideas, reasoning, and arguments within a concise, organized classroom structure.

B. Michelle Rinehart

@HowWeTeach

Region 18 Education Service Center, Fort Davis, Texas

Walter E. Washington Convention Center, 201











8:00 A.M.-9:15 A.M.



Origami for Engineering: Collapsing, Functional, and Strong

10-12 Workshop

Origami is an art form that is ubiquitous in nature, yet fundamentally linked to mathematics and science. Participants will examine and produce some of the basic folds that are foundational to modern engineering developments including solar arrays, bulletproof shields, automobile airbags, and surgical instruments.

Keith Nabb

University of Wisconsin-River Falls Jaclyn Murawska

Saint Xavier University, Chicago, Illinois

Walter E. Washington Convention Center, 147 A



Professionalism in a Digital Age

Coaches/Leaders/Teacher Educators Workshop

Participants will investigate one district's vetted digital resources and tools for growing math knowledge, analyzing and responding to students' mathematical ideas, fostering positive attitudes toward continued professional learning in math, and building professional networks to support and sustain continuous growth and learning.

Amy Seylar

@ASeylarWCPS

Washington County Public Schools, Hagerstown, Maryland Angela Waltrup

Frederick County Public Schools, Maryland

Walter E. Washington Convention Center, 204 AB



Tape Diagrams and Equation: From One-Step to Simultaneous Equations

6-8 Workshop

Tape diagrams can model a wide variety of equations and can help students make sense of the steps used in an algebraic solution. In this workshop, we will link tape diagram and algebraic solutions in a progression that begins with one-step equations and culminates in simultaneous equations.

Krystal Smith

Cheektowaga Central School District, New York Jessica McGill

Cheektowaga Central School District, New York Kathy Lambert

Cheektowaga Central School District, New York

Walter E. Washington Convention Center, 207 B

592 CHANGE

Transforming High School Geometry

8-10 Workshop

What is the role of transformations in rigorous high school mathematics? Beyond games of slide, turn, and flip, can transformations be fun, rigorous, and powerful? Catalyzing Change calls for students to use transformations rigorously to prove results in geometry; this session shows how that can be fun and accessible using the cycle of inquiry.

Paul Kellev

Anoka High School, Minnesota

Max Ray-Riek

Illustrative Mathematics, Philadelphia, Pennsylvania

Francis Su

Harvey Mudd College, Claremont, California

Walter E. Washington Convention Center, 207 A











593 MODEL

"Who Wants To Be A Millionaire": A Contestant's Mathematical Perspective

8-10 Session

How does knowledge of expected value affect a game show contestant's "best choice"? How have differing prize values and rules changed the game over the years? Come use various dynamic technologies to explore, play, and simulate with a recent Millionaire contestant.

Mike Reiners

→@TheTaskMathster

Christ's Household of Faith School, St. Paul, Minnesota

Walter E. Washington Convention Center, 151 A

594 CCC

Developing Authentic Real-World Mathematics Tasks for Middle School

6-8 Session

We will begin by sharing some "real-world" problems from middle school mathematics textbooks. Then we will lead a discussion of the authenticity of the problems. Next we will share a framework for authentic real-world problems. Finally we will share some authentic real-world examples and how we were guided by the framework in developing them.

Thomas Edwards

Wayne State University, Detroit, Michigan

S. Asli Ozgun-Koca

Wayne State University, Detroit, Michigan

Kenneth R. Chelst

Wayne State University, Detroit, Michigan

Walter E. Washington Convention Center, 152 A

95 TLC

Additive Thinking in the Elementary Classroom

Pre-K-2 Session

Students struggling in mathematical problem solving may be using inefficient counting strategies rather than additive strategies. During this session, we will explore a variety of additive strategies, ways of using manipulatives to develop deeper understanding, and strategies for moving from concrete to abstract representations.

Sandi Berg

y@wdotcom

Central Alberta Regional Consortium, Red Deer

Walter E. Washington Convention Center, 103 B

596 TLC Blast from the Past: Return of the Tug of War

6-8 Session

Sometimes looking to the past is the best way to move forward. Come experience the "Mathematical Tug-of-War"—a rich task that has been engaging students in the SMP for over 25 years. We'll also engage with other "oldies but goodies"—tasks that have been around for years, but encourage student reasoning, visualization, and creative thinking.

Julie McNamara

y@juliemcmath

Cal State East Bay, Hayward, California

Walter E. Washington Convention Center, 146 A











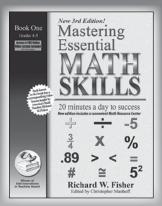
Do your Students Hate Math?

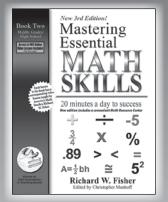
Are they frustrated and making poor progress? Are you tired of the struggle?

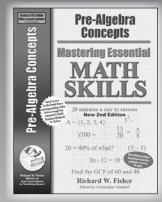
MATH ESSENTIALS has a program to fill in all the gaps. Students will achieve success and build confidence. Each easy-to-understand lesson includes an online video tutorial taught by the author. Students who have struggled with math in the past will soon excel. The author is of the belief that ALL kids can learn math! This shows in the materials he has created.

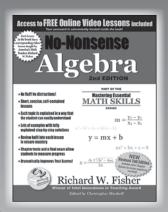
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597 TECH

Connected Mathematics Classrooms via Skype: Understanding Different Mathematical Contexts

6-8 Session

We will explore how video-conferencing technology can be used between classrooms in different social contexts. When students were engaged in a collaborative project, they improved proportional reasoning through a rich discussion across multiple classrooms. To illustrate this strategy, we will show setup, tasks, classroom video, and discussions.

Sheunghyun Yeo

University of Missouri-Columbia

Corey Webel

University of Missouri-Columbia

Hyunchul Yoon

University of Missouri-Columbia

Walter E. Washington Convention Center, 154 AB

598 TECH

Counting, Cardinality & Coding: Making Connections to Number Sense

Pre-K-2 Session

We all know that counting and cardinality are important in K–2, but what about coding? During this session, you will be exposed to how coding is appropriate for K–2 students and how it can be integrated into your daily lessons to increase number sense and create a game atmosphere. Classroom clips and lesson resources will be shared.

Allison Davis

@KinderCats

Knox Gifted Academy, Chandler, Arizona

Walter E. Washington Convention Center, Salon G

599 A&

Equitable Mathematics Teaching Planning Tool

Coaches/Leaders/Teacher Educators Session

This session features strategies for planning equitable mathematics lessons which includes posing purposeful questions to encourage sense making and using exit tickets to increase access and participation for all learners. Early career teachers will be guest speakers in this session to share about using an equity sticky note for planning lessons.

Imani Masters Goffney

University of Maryland, College Park

Antonia Adams

Houston ISD, Texas

Kelly Watson-Ivy

Houston ISD, Texas

Walter E. Washington Convention Center, 146 C

600 A&E

Equity, Math, and the Opportunity Gap: What Does It Mean to Your School?

General Interest Session

This presentation reframes the achievement gap as a gap of opportunity and does so using examples from medicine and sports to help us understand the dynamics at play in schools. In particular, we explore the idea of identifying "math talent" at a young age and how this paradigm affects opportunity. We also discuss: How can your school respond?

Valerie Faulkner

North Carolina State University, Raleigh

Walter E. Washington Convention Center, Ballroom B

601 TECH

How Three Technologies Will Change How We Teach & Learn Mathematics

10-12 Session

There are three technologies that will fundamentally change the way to we teach mathematics: connected spaces, digital ink, and augmented reality. Sitting in a "hothouse" situation, I've had the opportunity to embed these technologies in my classroom over a number of years, and I'd like to share with you the successes and failures—what's on your horizon.

Cal Armstrong

> @sig225

Appleby College, Burlington, Ontario, Canada

Walter E. Washington Convention Center, 202 A











602 TLC I've Selected a Good Task. Now What?

3-5 Session

Selecting good tasks is an important, first step in planning an effective mathematics lesson. But what do we do next? In this session, participants will identify actions they can take to advance student learning with the tasks they select. The session will explore anticipation, evidence, misconceptions, and next steps. Resources will be shared.

John SanGiovanni

@JohnSanGiovanni

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Howard County Public School System, Ellicott City, Maryland

Walter E. Washington Convention Center, Salon C

603 TLC

Launch, Explore, Summarize: Strategies to Implement Problem-Based Lessons

General Interest Session

Have you ever said, "I want to shift to problem-based lessons, but the time and expertise needed to create and implement them is daunting"? In this session, we walk participants through a Launch-Explore-Summarize lesson format and share strategies to shift practice towards effectively implementing tasks that promote reasoning and problem solving.

Amy McQueen

y @atmcqueen

David Douglas School District, Portland, Oregon Steve Vancil

David Douglas School District, Portland, Oregon

Walter E. Washington Convention Center, 204 C

604 TLC

Make Math Meaningful: Valuable Visuals for Connecting Fraction and Decimal Operations

3-5 Session

Making sense of decimal concepts and operations requires strong connections with fractions and place value. Join us as we explore fraction and decimal multiplication using concrete and visual models, connected to written work, and grounded in problem solving. Classroom-ready presentation materials will be included.

Kimberly Rimbey

KP Mathematics/Buckeye Elementary School District, Phoenix, Arizona

Walter E. Washington Convention Center, 203 AB

605 ISSUES

Mathematics Matters: Understanding the Importance of the "M" in STEM!!!

General Interest Session

It's time for teachers to recognize that providing students with opportunities that develop their sense of agency as learners and doers of mathematics is the number one priority for STEM readiness. Participants will discuss the role that mathematics plays in providing each and every student with the option to pursue a STEM related field of study.

John Staley

@jstaley06

Baltimore County Public Schools, Maryland

Walter E. Washington Convention Center, Salon I











606 ISSUES

One Math Teacher, One Science Teacher, One Technology Ed Teacher . . . One Authentic STEM Unit of Study

10-12 Session

Ever question how to effectively work with teachers to deliver one, authentic STEM unit of study for your students? Worried about losing too much time? The presenters will explain how a collaborative summer experience translated into a year long, curricular experience for their students . . . and how you can make STEM more than just an acronym.

Brian Drelick

y@HighPointSTEM

High Point Regional High School, Sussex, New Jersey Ann Yaccarino

High Point Regional High School, Sussex, New Jersey Rebecca Sarno

High Point Regional High School, Sussex, New Jersey

Walter E. Washington Convention Center, 150 A

607 A&E

Mindful Math Techniques for Building **Concentration, Confidence, and Cultural** Capital

Coaches/Leaders/Teacher Educators Session

Using 3,000-year-old ancient Indian techniques, participants will learn experientially through kinesthetic, aural, visual, and mental concentration methods used for learning proficiency of the foundational skills of subtraction, addition, and multiplication as tools for development of full human potentiality within Indigenous communities.

Michael Little Crow

Scottsdale Community College, Arizona

Uraiwan Pinthong

Arizona State University, Glendale

Walter E. Washington Convention Center, Ballroom C

To Argue or Not to Argue: That Is the **Ouestion**

8-10 Session

Supporting high school students in constructing and critiquing mathematical arguments is important in today's schools. We highlight a combination of instructional practices related to argumentation. Two early career teachers will illustrate their insights into supporting argumentation using an algebra-based task.

AnnaMarie Conner

University of Georgia, Athens

Julie Russell

Madison County High School, Georgia

Sarah Wallace

Madison County High School, Georgia

Walter E. Washington Convention Center, 145 AB

609 ASSESS

U.S. Twelfth-Grade Students' **Performance in Advanced Mathematics** in an International Context

10-12 Session

A study of the performance of U.S. students on the 2015 TIMSS Advanced assessment. We will use released items to address general strengths and weaknesses and illustrate pervasive errors across a range of content domains. This analysis of student performance will inform teachers about common misconceptions that could be present in their classrooms.

Alka Arora

American Institutes for Research, Washington, D.C. Lisa Clark

American Institutes for Research, Washington, D.C.

Walter E. Washington Convention Center, 147 B











610 TLC

Using Number Talks to Foster a Growth Mindset

General Interest Session

This session will explore how to foster a growth mindset in students through number talks. Classroom videos and examples of student thinking will be used to analyze teacher moves that offer accessibility for all students and encourage a productive disposition, perseverance in problem solving, and a willingness to explore and investigate ideas.

Sherry Parrish

y @numbertalks

Author and Consultant, Birmingham, Alabama

Walter E. Washington Convention Center, Ballroom A

611 A&E

Using Oldies and New Hits to Introduce Statistics

6-8 Session

The presentation will demonstrate the use of music to introduce statistics. Participants will use an "oldie but goodie" song to engage actively in counting, frequency tables, and graphs. They explore the activity using a more recent song appropriate for middle grades, create a frequency table and graph of the data, and design an assessment rubric.

Ali Foran

Texas A&M University, College Station Dianne Goldsby
Texas A&M University, College Station
Yujin Lee

Texas A&M University, College Station

Walter E. Washington Convention Center, 102 AB

9:30 A.M.-10:30 A.M.

612 A&E

Value-Added Student Growth & Rtl/ MTSS Success: Teacher Practices, Beliefs, & Growth-Mindset Matter!

3-5 Session

Dissertation study found that levels of personal teacher growth mindset positively correlated to value-added growth. Recommendations, situated within my experience as a RtI facilitator and math support specialist, to be addressed. Participants will be polled via personal devices to conceptualize study results and to ground practical recommendations.

James Jones

j@james_w_jones

Fox Chapel Area School District, Pittsburgh, Pennsylvania

Walter E. Washington Convention Center, 140 AB

613 A&E

Women's Roles in Mathematics with Connections through the Arts and Literacy

3-5 Session

This presentation will focus on the integration of mathematics, ELA, and arts that will support the development of visual spatial abilities. These activities will be organized around the contributions of women mathematicians throughout history. Connections will be made to current trends in media such as *Hidden Figures* and *The Glass Universe*.

Judy Werner

Slippery Rock University, Pennsylvania

Suzanne Rose

Slippery Rock University, Pennsylvania

Walter E. Washington Convention Center, 146 B











613.1 **ew** TLC

AP® Calculus Panel Discussion with Stephen Davis (Part 1)

10-12 Exhibitor Workshop

A panel of AP experts led by chief reader Stephen Davis will discuss the 2017 exam and other AP Calculus topics. Q&A and raffle to follow. Double-length session.

Bedford, Freeman & Worth Publishers

Hamilton, New Jersey

Walter E. Washington Convention Center, 159 AB

613.2 **CW** TECH

New Resources to Make Teaching Statistics Easier

10-12 Exhibitor Workshop

Presented by Daren Starnes, Josh Tabor, Doug Tyson, and Luke Wilcox. Learn about the new-and-improved teacher support materials for *The Practice of Statistics 6e* and *Statistics and Probability with Applications 3e*, including TheStatsMedic—an amazing resource with free activities, lesson plans, and thought-provoking blog posts. Samples provided.

Bedford, Freeman & Worth Publishers

Hamilton, New Jersey

Walter E. Washington Convention Center, 143 C

613.3 **ew** TLC

Engaging K-5 Students with Differentiated Rich Math Tasks

3-5 Exhibitor Workshop

Participants will explore differentiated rich math tasks that allow students to think deeper about mathematics no matter their skill levels. Session will include hands on activities and discussion on how to apply what you learned to your classroom instruction. Leave with a differentiated rich math task that you can use in your K–5 classroom right away.

Big Ideas Learning

Erie, Pennsylvania

Walter E. Washington Convention Center, 156

9:45 A.M.-11:00 A.M.

614 A&E

BBA: Promoting Equity while Teaching and Learning Mathematics!

8-10 Workshop

This workshop will consist of hands-on, student-centered activities and strategies that are geared toward diversity and equity in the mathematics classroom. Participants will leave with many free resources that can be readily implemented in the classroom.

Michelle Edwards

Parkview Arts & Science Magnet High School, Little Rock, Arkansas

Karen Rivers

Parkview Arts & Science Magnet High School, Little Rock, Arkansas

Walter E. Washington Convention Center, Salon H

615 TLC

Beginning Bar Model Boot Camp: Getting Started with Model Drawing

3-5 Workshop

Improving students' problem-solving abilities is a major objective of Common Core and state standards, and model drawing is a powerful tool that students can use to attack complex problems. Come investigate methods of teaching and assessing tape diagrams for those persnickety word problems, and explore interactive model drawing technology.

Cassandra Turner

@Cassyt

Math Champions Professional Development, Fort Collins, Colorado

Elizabeth Curran

Math Champions Professional Development, Fort Collins, Colorado

Walter E. Washington Convention Center, 144 ABC











9:45 A.M.-11:00 A.M.

616 CCC

Creating a Lesson Sequence Better Than The Sum of The Parts

6-8 Workshop

There is no shortage of mathematical activities for teachers. The great ones engage students in productive mathematics and discourse, yet are often isolated instances within a unit. As teachers, how do we leverage these individual activities to create not just one great activity, but instead create a coherent sequence of ideas for deeper learning?

Kristin Gray

Illustrative Mathematics, Lewes, Delaware

Walter E. Washington Convention Center, 201



I've Got Next: Engaging All Students with Multiple Response Strategies

3-5 Workshop

Effective educators seek opportunities to engage all students in grade-appropriate instruction through the use of response strategies. Response strategies can assist in creating student-centered classrooms that encourage independent and collaborative thinking. Participants will learn how to implement and create tools to increase student engagement.

Tasha Frazier

y @dallasschools

Dallas Independent School District, Texas

Antoinese Leake

Dallas independent School District, Texas

Chandra Boone

Dallas independent School District, Texas

Walter E. Washington Convention Center, 209 ABC

618 TLC Math Play with a Purpose

Pre-K-2 Workshop

Children love to play games. Participants will explore how to support the development of young mathematicians through purposeful play using manipulative-based games. The focus will be on the Standards for Mathematical Practice and the content domain of Number & Operations in Base Ten, including number sense, computation, and estimation.

Kathryn Coffey, PhD

y@literacygurl

Grand Valley State University, Allendale, Michigan **David Coffey**

Grand Valley State University, Allendale, Michigan

Walter E. Washington Convention Center, 143 AB

619 TLC

Meeting the Instructional Needs of Struggling Learners

6-8 Workshop

Should we encourage struggling learners to "just memorize the rules" or focus on conceptual understanding? Workshop participants will engage in discourse, dig into activities, and share ideas about how to assist struggling learners to become active participants in their own learning and to believe that, they too, can learn mathematics.

Karen Gartland

@KarenGGartland

Groton-Dunstable Regional School District, Harvard, Massachusetts

Walter E. Washington Convention Center, 150 B

620 TECH

Partnering Math & Computer Science

8-10 Workshop

Is it possible to learn or apply mathematical concepts while also developing programming literacy? Come experience how we are partnering algebra and geometry with computer science including low floor high ceiling scenarios, visual patterns, and real-world modeling. Bring a computer to access Scratch, Beetle Blocks, and Python resources.

Mike Larson

@BoundsofoutMath

Mounds View Public Schools, Shoreview, Minnesota

Ashley Tewes

Mounds View Public Schools, Shoreview, Minnesota

Walter E. Washington Convention Center, 207 B











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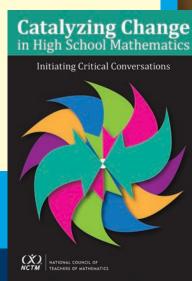
- Facilitating Meaningful Mathematical Discourse (Pre-K-Grade 12)
- Supporting Students' Productive Struggle (Pre-K-Grade 12)
- Algebra Readiness for All Students (Grades 6–8)
- Making Mathematics Accessible (Grades 4–8)

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9:45 A.M.-11:00 A.M.

621 PROF

Powerful Professional Learning: Essential Principles for Engaging ALL Adult Learners

Coaches/Leaders/Teacher Educators Workshop

Are you a mathematics leader looking for techniques to actively engage your preservice and in-service participants in mathematical thinking, reasoning, and reflecting? This lively session will engage participants in discovering specific strategies that can be applied to a variety of mathematics topics to enrich all professional learning experiences.

Beth Kobett

y@bkobett

Stevenson University, Maryland

Delise Andrews

Lincoln Public Schools, Nebraska

Walter E. Washington Convention Center, 207 A

622 TLC

Teaching Mathematical Behaviors: Successful Classroom Management for Math Teachers

6-8 Workshop

Effective mathematics teachers do not concentrate on misbehavior, they support positive participation. Participants will engage in activities that they can use to identify, clarify, and teach specific mathematical behaviors, behaviors that lead to classrooms where students productively engage with mathematics and with each other.

Robert Wieman

Rowan University, Glassboro, New Jersey Jill Perry

Rowan University, Glassboro, New Jersey

Walter E. Washington Convention Center, 152 B

623 TI

The Gap Trap and Other Risky Reasoning: The Kryptonite of Fraction Fluency

3-5 Workshop

It is well known that Kryptonite robs Superman of his powers. In the same way, invalid fraction comparison strategies can rob students of the power of fraction fluency, zapping students' strengths for future work with proportional reasoning and algebra. This workshop focuses on tasks to prevent the development of these invalid strategies.

Joann Barnett

y@Joannbarnett

Missouri State University, Springfield

Patrick Sullivan

Missouri State University, Springfield

Kurt Killion

Missouri State University, Springfield

Walter E. Washington Convention Center, 202 B

624

The Power of a Number Line: Versatile, Functional, and Equitable

3-5 Workshop

The number line is a powerful model for students. It can be integrated throughout many math strands as a natural way to think about number relationships. In this session, we will explore hands-on activities using the number line. Come discover how you can use a number line and meter stick to find fraction and decimal equivalencies and more!

Kimberly Lawrence

Hanover County Public Schools, Mechanicsville, Virginia Laura Scearce

Hanover County Public Schools, Mechanicsville, Virginia Whitney Wells-Corfield

Hanover County Public Schools, Mechanicsville, Virginia

Walter E. Washington Convention Center, 151 B











9:45 A.M.-11:00 A.M.

625 TLC

The Right Task at the Right Time: **Developing Addition Fluency through** Conceptual Understanding

Pre-K-2 Workshop

Choosing purposeful, differentiated tasks can allow all students to build addition concepts that foster procedural fluency. Come see classroom video of students engaging in additive tasks that elicit student thinking and support all students' development. We will share ways to interpret students' behaviors based on research of student thinking.

Beverly Ford

@bevjford

AIMS Center for Math and Science, Fresno, California

Walter E. Washington Convention Center, 204 AB

626 CHANGE

Why Ask Why? Proof & Inquiry in High **School Mathematics**

8-12 Workshop

Intuition, experimentation, and examples lead to conjectures; mathematicians convince themselves, explain why results make sense, and prove and confirm their results. The reasoning is then used by the community to find new results. We will experience the cycle of inquiry discussed in Catalyzing Change from contexts across high-school mathematics.

Kanita DuCloux

University of Western Kentucky, Bowling Green

Karen Graham

University of New Hampshire, Durham

Daniel Teague

Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; North Carolina School of Science and Mathematics, Durham

Walter E. Washington Convention Center, 206

Write On! Strategies to Support **Elementary Mathematical Writing**

3-5 Workshop

Interested in learning about mathematical writing that encourages elementary students to reason and communicate mathematically? Join us to examine the specific purposes that define various types of mathematical writing. Participate in hands-on activities to identify ways to implement and engage students in elementary mathematical writing.

Madelyn Colonnese

@mcolonn1

University of North Carolina Charlotte

Tutita Casa

University of Connecticut, Storrs

Janine Firmender

University of Connecticut, Storrs

Walter E. Washington Convention Center, 147 A

11:00 A.M.-12:00 P.M.



Adapting Competition Problems to Rich Problem-Solving Tasks

8-10 Session

The MAA Curriculum Inspirations project connects the vast library of freely available American Mathematics Competition problems to the core curriculum in grades 6-12. We will share examples of how this content can readily be used to create tasks which meet problemsolving goals within specific courses such as algebra I, algebra II, and geometry.

Doug Ensley

@doug_ensley

Mathematical Association of America, Washington, D.C.

James Tanton

Mathematical Association of America, Washington, D.C.

Walter E. Washington Convention Center, 202 A











629 CCC

Building a Smaller, More Powerful Toolbox

10-12 Session

If math is a toolbox, students leave with faulty wrenches or trade critical thinking time for mastering tools time. What could happen if we prioritized tools that highlight foundational ideas and attack myriad problems? I will share the GEMA Table I have used in algebra 1 and 2 and help participants incorporate powerful tools into their practice.

Shira Helft

Gateway High School, San Francisco, California

Walter E. Washington Convention Center, 146 C

630 TLC

Building Mathematical Language & Precision through Routines

General Interest Session

Mathematics Language Routines (MLR) provide scaffolding for all students to engage in meaningful discussions by intentionally and systematically developing the language of mathematics. Experience MLRs and see them in action in classrooms as we explore how to build students' precision by honoring and amplifying their emerging language and ideas.

Christine Newell

✓ @MrsNewell22

Stanislaus County Office of Education, Modesto, California

Walter E. Washington Convention Center, Salon I

631 ASSESS

Content Literacy for Real: Becoming Literate Mathematicians

3-5 Session

A third-grade teacher and a literacy coach illustrate how they translated tools and structures for knowing readers and writers such as the Burke interview, Miscue Analysis, and a workshop model into mathematics instruction.

Sally Somerall

Dutch Fork Elementary School Academy of Environmental Sciences, Irmo, South Carolina

Kendall Donald

Dutch Fork Elementary School Academy of Environmental Sciences, Irmo, South Carolina

Walter E. Washington Convention Center, 151 A

TLC

Flipped Learning Is What Today's Kids Do

10-12 Session

"Google it." "Find it on YouTube." This is what this generation has grown up with. Everything that is known is available to them from their smartphones. So how should we teach them? Play on their field and make a video, but play by your rules and hold them accountable for it. A flipped class session for all from rookies to advanced.

Shawn Trotter

> @307Trot

PCSD #6, Cody, Wyoming

Walter E. Washington Convention Center, 102 AB

634 TECH

Geogebra and the Standards for Mathematical Practice

10-12 Session

In this session, participants will examine GeoGebra tasks and discuss ways that they can cultivate the varieties of expertise outlined in the eight Standards for Mathematical Practice. Participants should have some familiarity with GeoGebra. Bring your own GeoGebraloaded device.

Harry Washington Jr.

Millersville University of Pennsylvania

Walter E. Washington Convention Center, Salon G

635 TLC

Going beyond the Core: Surprising Extensions of Standard Mathematics Content

General Interest Session

Many mathematics results are not in any set of standards but are beautiful, surprising, and simple extensions of standard content. This talk discusses mathematics accessible to all students yet likely new even to most teachers, emanating from graphing, the Pascal triangle, similar triangles, exponential functions, and the mathematics of upsets.

Zalman Usiskin

University of Chicago, Illinois

Walter E. Washington Convention Center, Ballroom A











636 CCC

Helping Students Connect Mathematical Models and Representations: A Runway to Integrating the SMPs

3-5 Session

Dive deeper into mathematical models like open number lines and area models and see how they build place value understanding and mental math strategies and lay the foundation for key algebra concepts. Leave with practical strategies for helping all students compare and connect representations while integrating the SMPs into instruction.

Danielle Curran

@danigirl1216

Curriculum Associates, Reading, Massachusetts

Walter E. Washington Convention Center, 146 B

637 CCC



How Do We Prepare Students for Algebra?: Designing Tasks That Build Students' Algebraic Thinking

3-5 Session

In this session, teachers will examine evidence from grades 3–5 classrooms of children thinking algebraically. They will explore the criteria for designing tasks used in these classrooms, how these tasks reflect core algebraic thinking practices, their connections to arithmetic, and their alignment with the Common Core Mathematical Practices.

Maria Blanton

TERC, Cambridge, Massachusetts

Angela Gardiner

TERC, Cambridge, Massachusetts

Ana Stephens

TERC, Cambridge, Massachusetts

Walter E. Washington Convention Center, 152 A

Interpret How Students Use Their Fingers: Empower All Students' **Development in Number and Addition**

Pre-K-2 Session

Participants will hear research-based interpretations about how students use their fingers and the appropriate next steps for an equitable mathematical experiences. Watch class videos to know how to choose additive tasks that are differentiated based on the value of the addend to empower the child to develop the concept of number and addition.

Beverly Ford

@bevjford

AIMS Center for Math and Science, Fresno, California **Graciela Florez**

AIMS Center for Math and Science, Fresno, California

Walter E. Washington Convention Center, 154 AB



Learning Together: Collaboration on Mathematical Pedagogies in the Virtual and Global Community

Coaches/Leaders/Teacher Educators Session

Collaboration among teachers promotes ongoing professional growth and learning, yet there is not much said about virtual collaborations that extend to our foreign counterparts. This presentation discusses an online collaborative experience between math teachers from Guam, Japan, and China, involving the bilateral sharing of mathematical pedagogies.

Richard Velasco

Pullman School District, Washington/Texas Tech University Yujiro Fujiwara

Christian Academy in Japan, Tokyo/Texas Tech University

Walter E. Washington Convention Center, 204 C

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NOV 2018 28-30	NCTM Regional Conference & Exposition Seattle, WA
APR 2019 3-6	NCTM Annual Meeting & Exposition San Diego, CA

TOPICS & DISCUSSION

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- + Access, Equity, & Empowerment
- + Purposeful Curriculum
- + Assessment
- + Professionalism
- + Mathematical Modeling
- Understanding Cultures
 Communities
- + Emerging Issues & Hot Topics
- Policy Issues

640 TLC

Lessons for Mathematics Education Seen through a Storytelling Lens

General Interest Session

Drawing from 20+ years of research and practice in mathematics education, as well as from research in literacy, I describe three key lessons and their implications for teaching, learning, and building empowered and engaged communities of mathematics students. The three lessons focus on the power of mathematics socialization, spaces, and sponsors.

Erica Walker

y@EricaNWalker

Teachers College, Columbia University, New York, New York
Walter E. Washington Convention Center, 140 AB

641 TLC

Linking Children's Literature and Mathematics for Deep and Connected Learning

3-5 Session

This session presents a rationale for linking children's literature and mathematics, shares a scale that can be used to evaluate a book's potential for supporting mathematics instruction, and demonstrates literature as an important resource in connecting to students' diverse, cultural, linguistic, and community-based knowledge.

Terrell Young

Brigham Young University, Provo, Utah

Eula Monroe

Volunteer Mathematics Educator, Bowling Green, Kentucky Amy Roth McDuffie

Washington State University, Pullman

Walter E. Washington Convention Center, 150 A

642 TLC

Long Live Fractions, Bar Models, and Equations!

6-8 Session

Explore the connections between Cuisenaire rods, bar models, fraction equivalence, and part to whole relationships. We will use Cuisenaire rods and bar models to transition from concrete representations of fractions to concrete representations of one-step equations. Bar models and strategic problems are used to help develop algorithms.

Courtney Lewis

Walter E. Washington Convention Center, 145 AB

643 CCC

Making Connections, Cultivating Coherence: The Case of Fraction Operations

General Interest Session

Operations with fractions are often taught in silos. Learn how coherence can be cultivated through intentional questioning and visual models to connect fraction addition and division to operations with whole numbers. Explore tasks that bridge algorithms for fraction addition and fraction division through common denominators.

Melissa Carli

y@MCarliLovesMath

Lake County Schools, Howey in the Hills, Florida

Janet Andreasen

University of Central Florida, Orlando

Juli Dixon

University of Central Florida, Orlando

Walter E. Washington Convention Center, Ballroom C











644 TLC Playful Mathematical Routines

Pre-K-2 Session

Playful mathematical routines such as counting collections, quick images, number talks, clothesline and "which one doesn't belong" will be shared, with photos and video clips showing how K–2 teachers are using these routines. The number concepts that students develop while engaged in these routines will be highlighted.

Janice Novakowski

y
@jnovakowski38

Richmond School District, Vancouver, British Columbia

Walter E. Washington Convention Center, 203 AB



Rich Tasks That Promote Critical Thinking, Coherent Discourse, and Classroom Community

6-8 Session

Participants will receive a packet of challenging problems effective for winning student interest, developing critical thinking, and encouraging student discourse. Participants will learn from the experiences of one school how to introduce and use these problems. One student group will share their work and experience.

Hoyun Cho

Capital University, Columbus, Ohio

Gary Lawrence

Mustard Seed School, Hoboken, New Jersey

Walter E. Washington Convention Center, 146 A

646 TECH

The Wrong Answers of Khan Academy and How to Use Them

8-10 Session

Thousands of learners use Khan Academy every day for practice exercises. Thousands of learners produce thousands of answers—many of them wrong. Wrong answers can contain hidden partial understandings, waiting to be developed. In this session, we discuss potential ways to leverage answer data for meaningful learning in and out of the classroom.

Scott Farrar

y@farrarscott

Khan Academy, Mountain View, California

Cameron Christensen

Khan Academy, Mountain View, California

Walter E. Washington Convention Center, 147 B

PROF

Using Lesson Study to Support Vertical Articulation across Grade Spans

General Interest Session

Teachers from different grade spans rarely get to talk to each other, making it hard to provide coherence for students. Hear how our lesson study network of K–12 schools provides a structure for collaboration around vertical articulation across all grade spans. Activities include exploring research themes, lesson plans, and videos from our schools.

Courtney Ortega

Oakland Unified School District, California

Walter E. Washington Convention Center, Ballroom B

648 TLC

What Every Third Grader Needs to Know for Multiplication

3-5 Session

Skip counting is often used in preparation for multiplication, but it tends to lead students to answers without conceptual understanding, making application challenging. In this session, we will look at research which addresses this issue and provides a progression of tasks that lead from skip counting with meaning, to multiplicative reasoning.

Tiffany Friesen

AIMS Center for Math and Science Education, Fresno, California **Brook Lewis**

AIMS Center for Math and Science Education, Fresno, California

Walter E. Washington Convention Center, 103 B

648.1 **ew** TLC

AP® Calculus Panel Discussion with Stephen Davis (Part 2)

10-12 Exhibitor Workshop

A continuation of the prior session. Please attend both parts. After the panel, there's a Q&A and raffle. Come, meet the panelists, and enjoy the discussion.

Bedford, Freeman & Worth Publishers

Hamilton, New Jersey

Walter E. Washington Convention Center, 143 C











649 TLC

A Baker's Dozen: Creative Activities for Elementary Educators

Pre-K-2 Burst

This session will focus on sharing 13 instructional strategies and activities that teachers can immediately implement in their classrooms. The strategies will include templates and lessons plans of hands-on activities that help students build strong, conceptual understandings of mathematics.

Margie Mason

The College of William and Mary, Williamsburg, Virginia Sam Rhodes

The College of William and Mary, Williamsburg, Virginia Jessica Duggan

The College of William and Mary, Williamsburg, Virginia

Walter E. Washington Convention Center, 149 AB

650 MODEL

Circles within Figure Skaters' Blade Tracings: Integrating Geometry and Algebra

8-10 Burst

Many students are intrigued by the Olympic sport of figure skating. We use skaters' on-ice paths as a context for students to model and describe 3-D artwork in a 2-D plane. We engage students in thinking about scaling, circular circumferences, and distance-rate-time as they "choreograph" figure skating moves. Sample student work is included.

Diana Cheng

Towson University, Maryland

Rachael Talbert

Towson University, Maryland

Walter E. Washington Convention Center, 147 A

651 PROF

Computational Thinking Converts: Elementary Math Teachers Learning from Pioneer Peers and Students

3-5 Burst

Elementary school math and computer science teachers worked with researchers to create activities that integrate computational thinking with mathematics in K–5. Join us to see examples, including student artifacts in Scratch, and reflect on the surprising discoveries teachers made as they taught and learned from their colleagues and students.

George Reese

y @mstegeorge

University of Illinois at Urbana-Champaign

Wendy Maa

Kenwood Elementary School, Champaign, Illinois

Walter E. Washington Convention Center, 201

652 A&E

Contextually Anchored Math Practices: Fusing Students' Families, Communities, and Out-of-School Experiences

Coaches/Leaders/Teacher Educators Burst

This session explores operationalizing culturally responsive practices in mathematics through contextual anchoring and affirms the valuing of ALL students. It highlights specific examples of how K–5 teachers can use students' backgrounds, families, communities, and out-of-school experiences to anchor the learning of mathematical concepts.

Shonda Lemons-Smith

Georgia State University, Atlanta

Walter E. Washington Convention Center, 209 ABC

2018 Regional Conferences

Hartford, Connecticut • October 4—6 (Thursday—Saturday)
Kansas City, Missouri • November 1—3 (Thursday—Saturday)
Seattle, Washington • November 28—30 (Wednesday—Friday)













653 TLC Cuisenaire Rod Riddles for Fractions and Percents

3-5 Burst

Use cuisenaire rods to develop students' understanding of the numerator as the "counting number." As the length of the whole changes, different rods can be used to explore equivalence and fractions greater than one. These concepts can then extend into percents. Get ideas for differentation, and support for communication of reasoning.

Noelle Won

California State University Stanislaus, Turlock **Amy Bennett**

Ceres Unified School District, California

Walter E. Washington Convention Center, 151 B

654 A&E

Empowering Diverse Student Populations Using Culturally Responsive Teaching and Cooperative Learning

General Interest Burst

We will share pedagogical strategies that promoted equitable math teaching and learning in a diverse college classroom of historically struggling students. Attendees will learn how culturally responsive teaching, cooperative learning, and other approaches were successfully implemented in the classroom to positively impact students learning math.

Michael Furuto

University of Hawai'i-West O'ahu, Kapolei

Kriselyn Cortado

University of Hawai'i-West O'ahu, Kapolei

Thalia Lawrence

University of Hawai'i-West O'ahu, Kapolei

Walter E. Washington Convention Center, Salon H

655 MODEL

Explore Mathematical Modeling: Estimating the Number of Fish in a Pond with Sampling

10-12 Burst

To understand mathematical modeling, you need to experience mathematical modeling. How can we estimate the number of fish in a pond with a sample? How can we test our model using hands-on simulation or technology? What assumptions does our model have? Come explore the capture-recapture method to estimate the total number of fish in our pond.

S. Leigh Nataro

@mathteacher24

Moravian Aacdemy, Bethlehem, Pennsylvania

Walter E. Washington Convention Center, 144 ABC

656 TLC

Finding the Math in Nature: Developing a Conceptual Understanding of Measurement and Data

Pre-K-2 Burst

During this burst, the speakers will share how they purposefully incorporated meaningful mathematics into their scientific explorations in nature. Specifically, the speakers will share how they helped their early childhood students to collect, represent, and analyze metric and U.S. customary measurement data in an outdoor classroom.

Karen Capraro

▼@karen_capraro Rhode Island College, Providence Michelle Nonis

Rhode Island College, Providence

Walter E. Washington Convention Center, 207 A











657 PROF

Five Strategies for Increasing Family Engagement

General Interest Burst

Would you agree that families are our best resource for real-life problems? What do selfies have to do with family engagement? How can student led conferences build connections? What can we do to partner with ALL families? We will share our curiosity and experience engaging families with our proven strategies that empower families.

Jayne Lynch

Cambridge Public Schools, Massachusetts

Eileen Gagnon

Cambridge Public Schools, Massachusetts

Walter E. Washington Convention Center, 152 B

658 TECH

Making Mathematics Come Alive with Desmos Classroom Activities

6-8 Burst

Desmos classroom activities invite students to connect how working mathematically means working socially and creatively. Learn how to utilize these activities in your classroom to get your students to engage in mathematical discourse, creating persuasive arguments and explanations that their peers will assess for clarity.

Allen von Pallandt

🏏 @baronallenmdvp

The College Board, New York, New York

Katie Sheets

Sioux Falls School District, South Dakota

Walter E. Washington Convention Center, 150 B



Measuring Math Anxiety in Classrooms

General Interest Burst

In a series of small cognition lab studies using eye tracking software, we developed and validated a selfreport tool to measure math anxiety of children in grades 5–12, examining the effects of math test item design on the working memory and math anxiety.

Melanie Rainbow-Harel

ACT, Inc., Iowa City, Iowa

Walter E. Washington Convention Center, 207 B

Placement, Programs, and Practice: **Ensuring Access and Success for ALL** Secondary Math Students

8-10 Burst

School leaders are commissioned with making program and classroom decisions for secondary math; these decisions can support student access and success or they can act as serious barriers. This workshop will explore three key decision points that influence math access for all students: placement policies, program offerings, and classroom practice.

Robb Christopherson

y @robbcedd

Clovis Unified School District, California

Geoff Dean

Clovis Unified School District, California

Tracie Soares

Clovis Unified School District, California

Walter E. Washington Convention Center, 202 B

661 ASSESS

Self-Regulation: Teaching Students How to "Self-Direct" Their Learning

10-12 Burst

Self-regulation is a self-directive process by which learners transform their mental abilities into academic skills (Zimmerman 2002). This session will explore best practices for goal setting and monitoring progress, study strategies to attain goals, and self-evaluation methods.

Kathy Clemmer

Loyola Marymount University/El Segundo Unified School District, Los Angeles, California

Katie Laskasky

Loyola Marymount University, Chicago, Illinois

Tatiana Mirzaian

Loyola Marymount University, Chicago, Illinois

Walter E. Washington Convention Center, 204 AB











Tackling CPA (Concrete, Pictorial, and Abstract) Concepts in K–2

Pre-K-2 Burst

What happens when you teach a mathematics skill to students one day and they come back the next day and have forgotten it? Providing students with meaningful tasks supports opportunities to engage students as they grapple with mathematical ideas and relationships with CPA. Come join us as we work on titillating tasks!

Laurie Boyer

y@laurieb1723

St. Lucie Public Schools, Port St. Lucie, Florida

Michele Beckford

St. Lucie Public Schools, Port St. Lucie, Florida

Adrianne Mendoza

St. Lucie Public Schools, Port St. Lucie, Florida

Walter E. Washington Convention Center, 143 AB

663 MODEL

To Vote or Not to Vote? Modeling Current Events with Mathematics

8-10 Burst

In this session, I will share how to incorporate current events in math class to support students' learning of ratio and proportion. Come to learn firsthand how to use Google Forms to model real-life scenarios. Explore how to engage students in math discussions that promote building their numeracy and increase their knowledge of political issues.

Aleksandra Kaplon-Schilis

The Clinton School for Writers and Artists, New York, New York

Walter E. Washington Convention Center, 103 A

663.1 TLC

Engage, Talk, and Connect . . . Etc., Etc., Etc.,

6-8 Burst

Participate in activities/tasks that engage your students to think, to wonder, to question, to talk, to problemsolve and to make connections!! Engage in a task, talk to other participants and connect as to how these can be applied in your daily instruction. Then share with your colleagues and students. Etc., etc., etc.,!!!

Barbara Webber

@BWebberBIL

Big Ideas Learning LLC, Lees Summit, Missouri

Walter E. Washington Convention Center, 206

12:30 P.M.-1:30 P.M.



Closing Keynote: Mathematics for Human Flourishing

General Interest Session

Mathematics is often valued for its ability to describe the world

in beautiful ways. Indeed, beauty is one of many ideals to which we aspire. But why does the practice of mathematics often fall short of our ideals and hopes? How can the deeply human themes that drive us to do mathematics be channeled to build a more beautiful and just world in which all can truly flourish?

Francis Edward Su is the Benediktsson-Karwa Professor of Mathematics at Harvey Mudd College, and past president of the Mathematical Association of America. His research is in geometric and topological combinatorics, and he also has a passion for teaching and popularizing mathematics. From the Mathematical Association of America, he received the 2001 Hasse Prize for expository writing, and the 2013 Haimo Award for distinguished teaching. He authors the popular Math Fun Facts website and is creator of MathFeed, the math news app. His hobbies include songwriting, gardening, photography, and theology. Just like mathematics, these are modes of creative expression that blend structure and freedom, truth and beauty, and reflection and action.

Francis Su

y@mathyawp

Harvey Mudd College, Claremont, California

Walter E. Washington Convention Center, Ballroom B













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4. Master





Akihiko Takahashi, Ph.D. DePaul University Editor in Chief Primary Math International

















BIGIDEASMATH

BY RON LARSON AND LAURIE BOSWELL

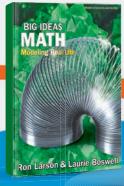
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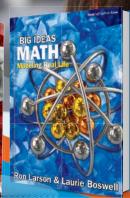
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Once you have joined NCTM, membership in an NCTM Affiliate is a terrific way to round out your professional involvement. Affiliates offer you an opportunity to link with teachers in your state, region, or city for support, professional development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

The Host Affiliates for this conference and the Affiliates-at-Large appears below. To join one of these organizations, email the Affiliate contact for membership information. NCTM has more than 200 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.

Host Affiliates

Maryland Council of Teachers of Mathematics

Soosan Faulk, soosanfaulk@gmail.com

Virginia Council of Teachers of Mathematics

Ruth Harbin Miles, rharbin@marybaldwin.edu

Affiliates-at-Large

Adult Numeracy Network

Pam Meader, mdr151@aol.com

Association of Mathematics Teacher Educators

Maggie McGatha, maggie.mcgatha@louisville.edu

Association of State Supervisors of Mathematics

Charles Watson, chaswatson@sbcglobal.net

Benjamin Banneker Association, Inc.

Shelly Jones, jonessem@ccsu.edu

Council for Technology in Mathematics Education

David Wees, davidwees@gmail.com

Council of Presidential Awardees in Mathematics

Donald Scheuer, mathguyl@verizon.net

National Council of Supervisors of Mathematics

Jessica McIntyre, jkanoldmcintyre@gmail.com

North American Study Group on Ethnomathematics

Tod Shockey, todshockey@gmail.com

Society of Elementary Presidential Awardees

Timothy Dalby, tdalby@wilmingtonfriends.org

TODOS: Mathematics for ALL

Susie Hakansson, shakans@g.ucla.edu

Women and Mathematics Education

Andria Disney, andriadisney@live.com

About the Host Organizations

The Maryland Council of Teachers of Mathematics (MCTM) is a professional organization whose purpose is to encourage an active interest in mathematics and its teaching and to work toward the improvement of mathematics education programs in Maryland. The Council's rich history dates back over 100 years to a group of educators who called themselves the Association of Teachers of Mathematics of the Middle States and Maryland. This group met regularly to publish a professional journal called The Mathematics Teacher, now published by the NCTM and widely read by thousands of teachers worldwide. The MCTM facilitates the exchange of ideas and facts about current issues, techniques and programs in the teaching of mathematics by providing conference, meeting, professional journal, and summer learning resources for its members. The council seeks out opportunities to work collaboratively with other state and national organizations to improve mathematics education and is proud to serve as a partner affiliate to the National Council of Teachers of Mathematics (NCTM).

The **Virginia Council of Teachers of Mathematics (VCTM)** was founded in March 1976 by a group of Richmond educators led by Dr. S. Stuart Flanagan. VCTM became an NCTM affiliate that April. Currently, VCTM has about one

NCTM affiliate that April. Currently, VCTM has about one thousand members. The VCTM Board is comprised of fifteen elected members and numerous committees. VCTM aims to stimulate an active interest in mathematics teaching and learning through its annual spring conference and occasional professional development workshops in various areas of Virginia. Annually, VCTM honors outstanding educators with the Educator of the Year Award. In addition, VCTM awards professional development grants to educators to continue and expand their professional knowledge, a scholarship to a college student pursuing a career in mathematics education, and an affiliate grant to support local state affiliates. The VCTM journal, Virginia Mathematics Teacher, is sent twice a year to all members. Information about all of the VCTM initiatives can

be found at www.vctm.org.

Officers and Committees

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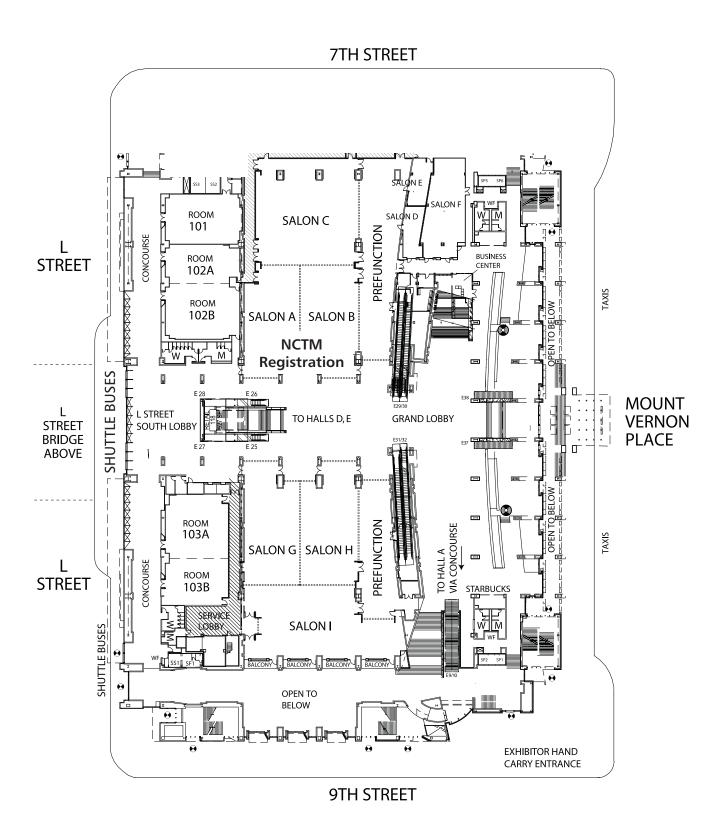
Host Affiliates Liaison

Ed Nolan, Maryland Council of Teachers of Mathematics; Towson University, Maryland Cathy Shelton, Virginia Council of Teachers of Mathematics; Fairfax County Public Schools, Virginia

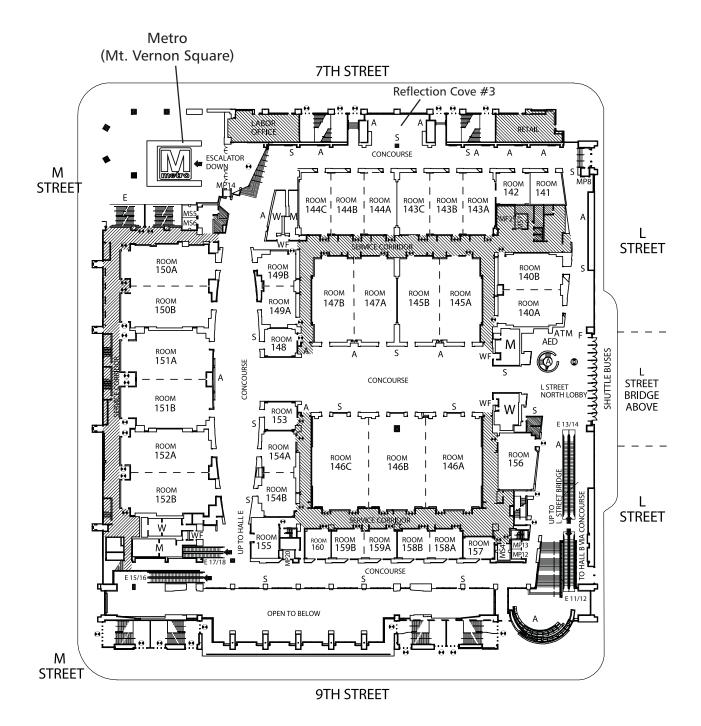
The National Council of Teachers of Mathematics is the public voice of mathematics education, supporting teachers to ensure equitable mathematics learning of the highest quality for all students through vision, leadership, professional development, and research. With nearly 80,000 members and more than 200 Affiliates, NCTM is the world's largest organization dedicated to improving mathematics education in prekindergarten through grade 12. The Council's *Principles and Standards for School Mathematics* includes guidelines for excellence in mathematics education and issues a call for all students to engage in more challenging mathematics. NCTM is dedicated to ongoing dialogue and constructive discussion with all stakeholders about what is best for our nation's students.

To learn more about NCTM products or services, including membership benefits and opportunities, visit www.nctm.org, e-mail nctm@nctm.org, or call (800) 235-7566.

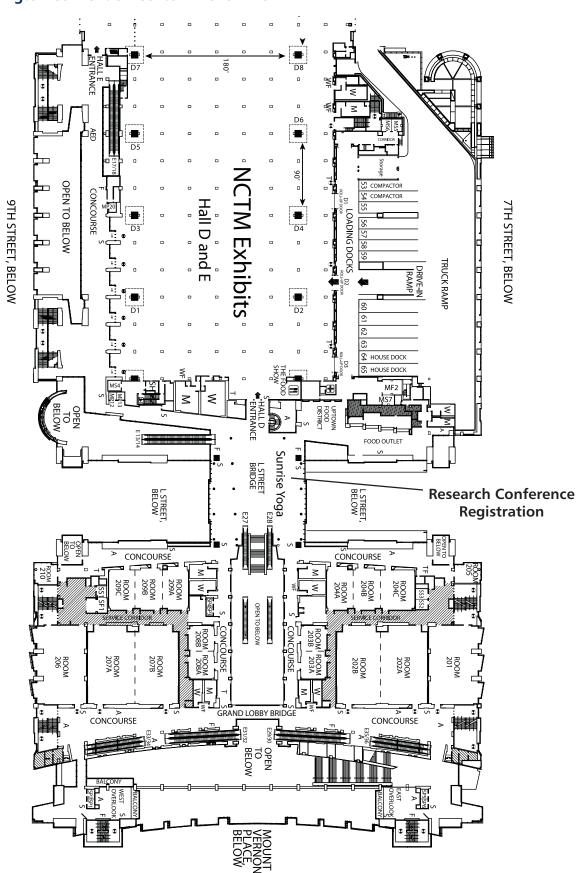
Walter E. Washington Convention Center—Street Level, Salons



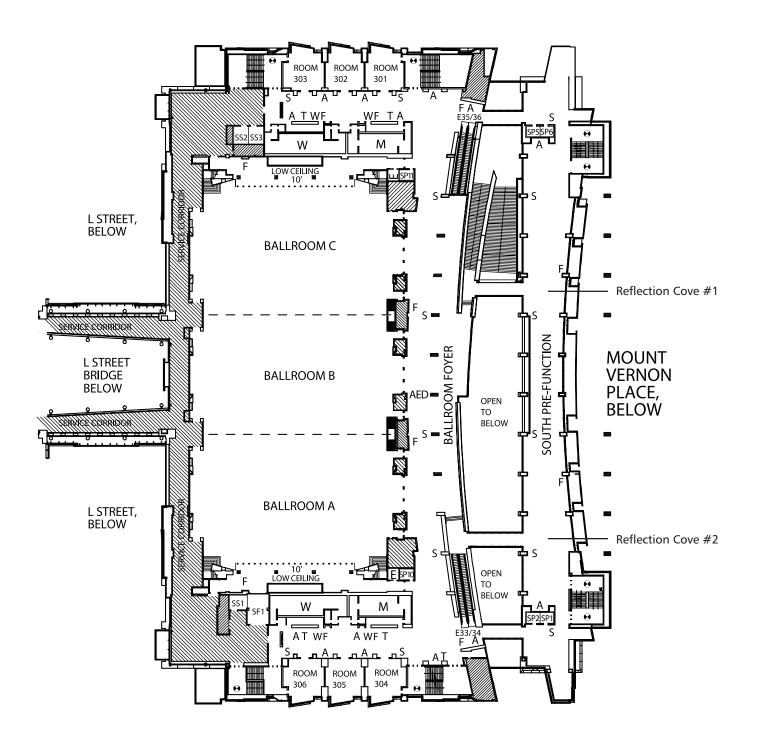
Walter E. Washington Convention Center—Street Level



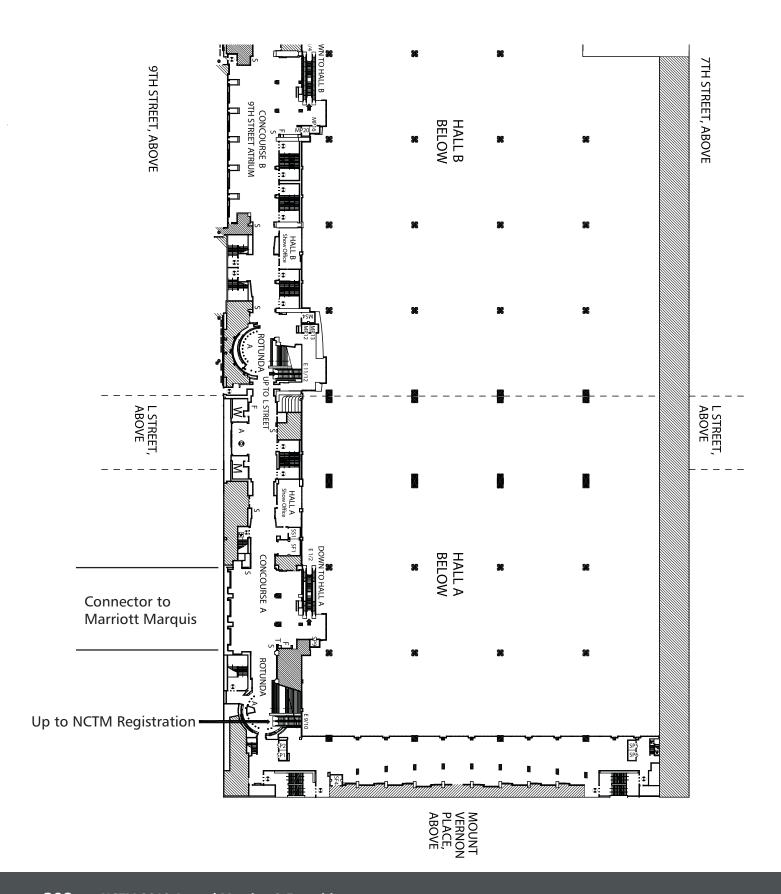
Walter E. Washington Convention Center—Level Two



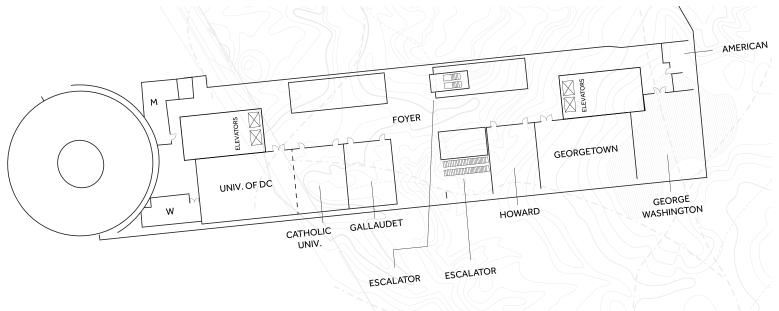
Walter E. Washington Convention Center—Level Three



Walter E. Washington Convention Center—Concourse



Marriott Marquis, Level M1



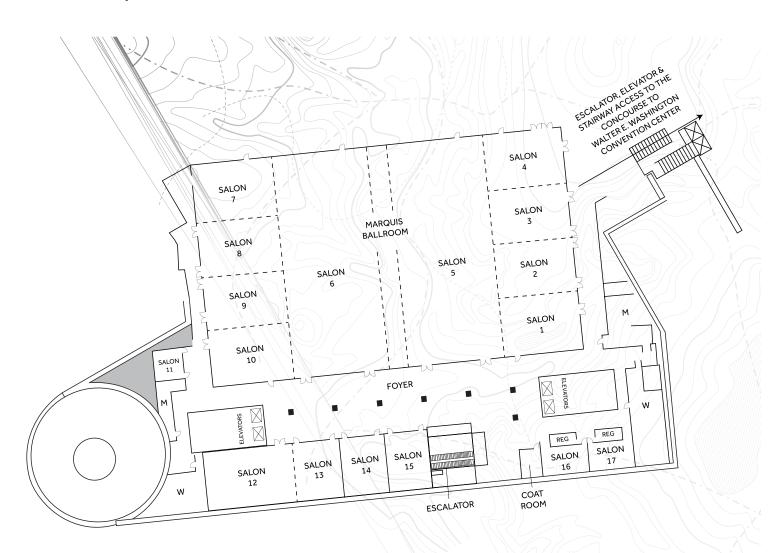
Directory and Special Locations

(All conference activities will take place at the Walter E. Washington Convention Center and the Marriott Marquis Hotel)

Rookstore	
	Exhibit Hall DE (WEWCC
	Exhibit Hall DE (WEWCO
	Ballroom B (WEWCO
	L Street Lobby South (WEWCO
	NCTM Central: Exhibit Hall DE (WEWCO
	Marquis Salon 1–2 (Marquis
	Main Lobby & Exhibit Hall Registration Area (WEWCO
	NCTM Central: Exhibit Hall DE (WEWCO
2 2	NCTM Central; Exhibit Hall DE (WEWCO
1	
1	
reconference Workshop Materials Pi	ckup/Lunch Prefunction Area 206–207 (WEWCC
eflection Coves Concourse by 144	A & 143 C; Prefunction Area by Ballroom A & C (WEWCO
egistration	Salon AB, East Registration (WEWCO
desearch Conference	
tesearch Conference Opening Session	n Room 202A (WEWCC
	L Street Bridge (WEWCC
hadowCon (Thursday)	Ballroom B (WEWCC
huttle Service Desk	L Street South Lobby (WEWCC
	L Street Bridge (WEWCO

Floor Plans

Marriott Marquis, Level M2



Marriott Marquis, Level M4

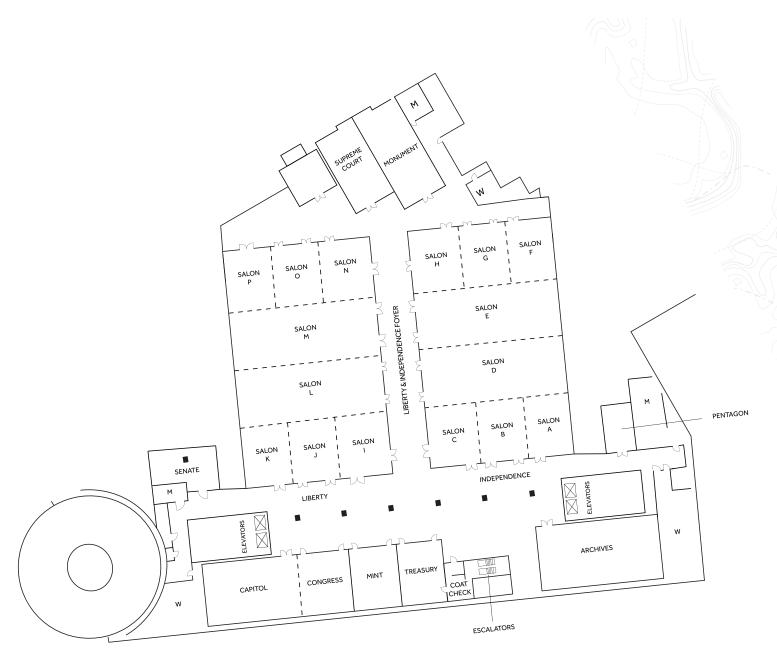


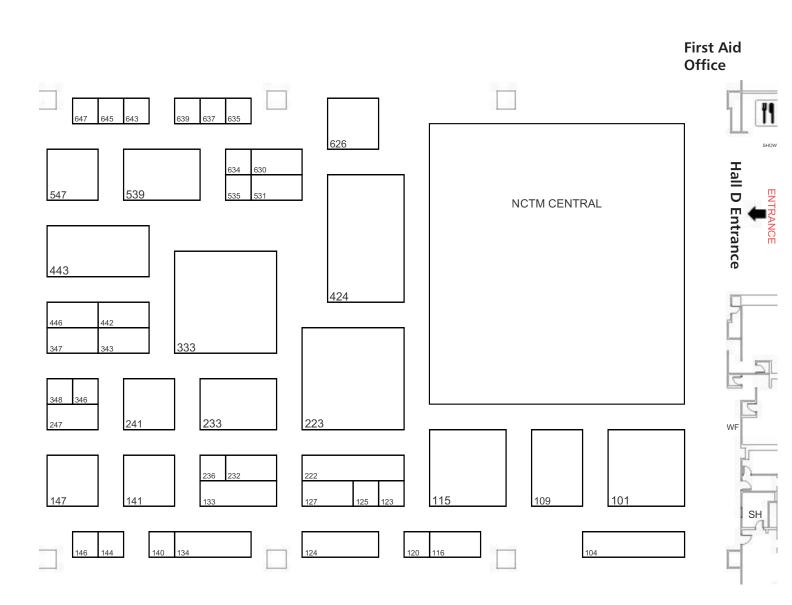
Exhibit Hall Floor Plan

Exhibit Hall DE Walter E. Washington Convention Center

693 691 683 681 679	675 673 671 663 661 657 653
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192 190 182 180 178	174 172 170 162 160 154 152

Exhibit Hall Floor Plan

Exhibit Hall DE Walter E. Washington Convention Center





#MTBoS: Math Twitter Blogosphere Booth 637

Salem, Massachusetts 879-528-4673

ExploreMTBoS.wordpress.com

The MTBoS is an informal network of math teachers forming community online through Twitter and blogs. We've built resources, curricula, and websites, and we've co-authored books. We run workshops, problem-solving groups, a weekly "department meeting" via webinar, and Twitter Math Camp. We are passionate teachers who take pride in freely sharing our ideas. Come meet fellow teachers who use the Internet to grow professionally. Browse the resources we've made. Even start your own Twitter account or blog!

3P Learning

Booth 162

New York, New York 866-387-9139

3plearning.com

Mathletics is a K–12 online resource for teachers and students designed to motivate, inspire, and help students learn new math concepts. Mathletics is accessible at home, in school, on iPads, and tablets. Teachers use videos, interactives, and animated support within the adaptive activities to teach and enhance learning. Live Mathletics strengthens computational fluency as students love to engage in real-time global or class challenges!

Α

Activate Learning

Booth 573

Greenwich, Connecticut 646-502-5231

activatelearning.com

American College of EducationBooth 673

Indianapolis, Indiana

American Statistical AssociationBooth 634

Alexandria, Virginia 703-684-1221

amstat.org/education

The American Statistical Association (ASA) is a scientific and educational society that works to improve statistical education at all levels. The ASA offers outreach activities and free resources such as teacher professional development, student competitions, publications, webinars, student activities, and lesson plans tied to the statistics standards in the Common Core. Stop by the ASA booth to chat with statistics educators and learn about ASA's free K–12 statistics education resources.

Amplify Booth 562

Brooklyn, New York amplify.com

Amplify is reimagining the way teachers teach and students learn. Our digital learning products for math—anchored by Amplify Math Projects and Amplify Fractions—engage and challenge students in unique ways, with college and career readiness in mind. Amplify Math Projects is project-based learning designed to make math creative and collaborative. Our new Amplify Fractions is an adaptive learning solution laser-focused on helping students master—and deeply understand—fractions.

Ascend Education

Booth 471

Lake St. Louis, Missouri 314-229-4493

ascendmath.com

Ascend Math is intensive math intervention that provides a unique study path for each student beginning at each student's functional grade level; delivers a unique study path through each student's individual skill gaps at every grade level; provides a unique study path for each student reaching below grade level and continuing through skill gaps at each level; and provides an individual study plan for each student reaching below grade level with a unique path through skill gaps at each level.

В

Bedford, Freeman & Worth (BFW) Publishers & W.H. Freeman & Company

Booth 442

Hamilton, New Jersey 866-843-3715

highschool.bfwpub.com

Bedford, Freeman & Worth (BFW) Publishers is your trusted source for innovative high school mathematics resources. We publish the best-selling *The Practice of Statistics, 5th Edition for AP* Statistics.* Stop by booth 442 to see and receive samples of our new AP* Calculus textbook, *Sullivan/Miranda Calculus for AP**, and our new high school statistics book, *Statistics and Probability through Applications, 3rd Edition.*

Bedtime Math Foundation

Booth 565

Summit, New Jersey 908-444-4522

bedtimemath.org

Bedtime Math is a nonprofit organization dedicated to helping kids love numbers so they can handle the math in real life. For families, we offer a wacky nightly math problem on our website, our free app, and our daily email. For schools, we offer Crazy 8s, a hands-on after-school math club designed to get kids in K–grade 5 fired up about math with high-energy activities like Spy Training and Toilet Paper Olympics. Bring Crazy 8s to your school and help kids learn to love numbers!

Benjamin Banneker Association, Inc.Booth 171

Orlando, Florida 941-356-0726

bbmath.org

The Benjamin Banneker Association is a national nonprofit organization dedicated to mathematics education advocacy, establishing a presence for leadership, and professional development to support teachers in leveling the playing field for mathematics learning of the highest quality for African-American students.

Big Ideas Learning, LLCBooth 223

Erie, Pennsylvania 877-552-7766

bigideaslearning.com

Big Ideas Math is a complete and continuous solution built for student success, with a variety of programs available from middle school to high school and a new K–8 program debuting at NCTM's 2018 Annual Meeting. The Dynamic Assessment System provides teachers and students an intuitive and state-of-the-art tool to help students effectively learn mathematics. The Dynamic Assessment System allows teachers to track and evaluate their students' advancement through the curriculum. Stop by booth 223 to learn more!

Borenson and Associates, Inc.

Booth 175

Allentown, Pennsylvania 800-993-6284

borenson.com

Borenson and Associates, Inc. seek to make algebra and fraction concepts visual and intuitive for elementary and middle school students. The popular Hands-On Equations® program for learning basic algebra has now been used by more than a million students. In addition, more than 50,000 teachers of grades 3–8 have attended the popular Making Algebra Child's Play® workshop. Visit our booth to see how we demystify the teaching of algebra and help teachers and students make sense of fractions.

Box Cars & One-Eyed Jacks IncBooth 560

Edmonton, Alberta, Canada 866-342-3386

boxcarsandoneeyedjacks.com

Box Cars and One-Eyed Jacks is the leader when it comes to math games. All of our award-winning K–10 resources are correlated to the Common Core State Standards and are used across the country. We are one of the leading suppliers of dice, cards, dominoes, and other math manipulatives. The Box Cars consulting team provides the best hands-on training in the country when it comes to games as a teaching strategy. We offer half, full, and intensive schoolwide trainings.

C

C King Education Inc.

Booth 572

Bridgeport, Connecticut **ckingeducation.com**

CanFigureIt

Booth 469

New York, New York

canfigureit.com

Our FREE, web-based resource enables high school students to work through proof activities independently and interactively by offering continuous feedback and relevant hints. CanFigureIt Geometry facilitates problem solving by breaking down complex proofs into manageable chunks, reinforces theorems visually, and fosters forward and backward reasoning. To support you, we've also designed a dashboard to inform data-driven pedagogical decision-making at the individual student and class level.

Carnegie Learning Booth 141

Pittsburgh, Pennsylvania 888-851-7094

carnegielearning.com

To support both group and individual learning, we provide consumable textbooks and intelligent software, as well as professional learning and data analysis services. Our solutions are designed to transform the math classroom, putting better math learning within reach for both teachers and students.

Carson Dellosa Publishing Booth 258

Greensboro, North Carolina 336-632-0084

carsondellosa.com

Carson-Dellosa[™] Publishing Group is the leading provider of supplemental educational products for educators and parents. The company's teacher-developed products and resources are thoughtfully designed to align to current state standards and meet children's diverse learning needs. Carson-Dellosa's award-winning brands include Carson-Dellosa Education[™], Spectrum®, Summer Bridge[™], Thinking Kids[™], and Brighter Child[™]. Carson-Dellosa is also the exclusive distributor for Mark Twain Media.

Casio America, Inc.

Booth 443

Dover, New Jersey 973-361-5400

casio.com

CASIO® has a full line of calculators for every level of education. As a leading producer of graphing, scientific, and basic calculators, CASIO calculators are easy-to-use and their time-saving operation makes it easier for students to learn. CASIO also provides calculator emulators, print materials and professional development for a total math solution. To see the full line of easy-to-use, cost-savings CASIO Calculators, visit www.casioeducation.com

Catherine Fosnot & Associates: New Perspectives

Booth 273

New London, Connecticut 917-523-2175

NewPerspectivesOnLearning.com

New Perspectives now offers a full core K–5 program with ten 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, learning communities, and workshops. Come to the booth for a preview of all of our new units and online tools and see what curriculum for the 21st century can look like.

Claire Lynn Designs

Booth 647

Midlothian, Texas 972-723-2251 clairelynn.com

College Board, The

Booth 479

New York, New York 212-713-8331

collegeboard.org

The College Board is a mission-driven notfor-profit organization that connects students to college success and opportunity. Founded in 1900, the College Board was created to expand access to higher education. Today, the membership association is made up of over 6,000 of the world's leading educational institutions and is dedicated to promoting excellence and equity in education.

Corwin

Booth 446

Thousand Oaks, California 800-233-9936

corwin.com

At Corwin, we have one objective and one objective only: to help educators do their important work better. We offer a host of independent and integrated professional learning options that conform with your budget, your timeline, and your objectives: books and resources, institutes, author consulting, Visible Learningplus, eLibraries, and eCourses. To learn more about our resources and services on language development, literacy, equity, leadership, math, science, and STEM, visit www.corwin.com.

CPM Educational Program Booth 343

Elk Grove, California 916-638-1145

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 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.

Creative Mathematics

Booth 372

Arcata, California 707-826-2965

creativemathematics.com

Creative Mathematics is a leading educational consulting company that has provided over 30 years of teacher training workshops in the United States, Canada, and internationally. Creative Mathematics offers books, music, supplies, and manipulatives that our presenters use in many of their presentations. Many of these materials are exclusive to Creative Mathematics and are both entertaining and powerful tools that can help improve your teaching now!

Curriculum Associates

Booth 279

North Billerica, Massachusetts 978-313-1269

CurriculumAssociates.com

Founded in 1969, Curriculum Associates creates research-based print and online instructional materials, screens and assessments, and data management tools. The company's products and outstanding customer service provide teachers and administrators with the resources necessary for teaching diverse student populations and fostering learning for all students. Learn more at www.curriculumassociates.com.

D

Desmos, Inc. Booth 346

San Francisco, California 415-484-5342

desmos.com

Explore math with Desmos. Graph functions, plot tables of data, evaluate equations, explore transformations, and much more—for free! Available online at desmos.com and in the iPad app store.

Didax Inc

Booth 253

Rowley, Massachusetts 978-997-4385

didax.com

Didax creates innovative hands-on resources to improve the teaching of mathematics. Our materials include books, manipulatives, and more for pre-K-grade 12. In addition, we work with Great Minds, the creators of Eureka MathTM, to provide the only authorized grade-level manipulative kits that support the curriculum. We also work with Math Perspectives to provide Kathy Richardson's K-2 online assessment system, Assessing Math ConceptsTM and the instructional program Developing Number Concepts.

Disney Youth Programs

Booth 236

Kissimmee, Florida 407-566-6430

disneyyouth.com

There is nothing more magical than inspiring a child to follow their passions, fulfill their dreams, and celebrate their accomplishments. At Disney Parks, our collection of standards-based, accredited field studies and educational seminars invite students to feel physics in action on thrilling attractions, team up to solve conservation challenges, explore new ways of thinking with Walt Disney Imagineering, and much more! Put the magic of Disney storytelling to work in your lesson plans this year.

DreamBox Learning

Booth 272

Bellevue, Washington 877-451-7845 x509

dreambox.com

DreamBox® Learning provides a deeply personalized K–8 math learning experience with lessons that differentiate for the highest levels of student achievement. Driven by Intelligent Adaptive Learning™ technology, students benefit from a rigorous curriculum in English and Spanish and embedded formative assessments. The result is a game-like experience that students love, actionable data that supports teachers so they can be powerful coaches, and outcomes administrators are proud to share.

Drexel University, School of Education

Booth 470

Philadelphia, Pennsylvania 215-895-1276

drexel.edu/soe

Drexel University School of Education offers part-time online MS degree and certificate programs in Mathematics, Learning, and Teaching. Courses are offered asynchronously online.

E

EAI Education

Booth 104

Oakland, New Jersey 800-770-8010

eaieducation.com

Your one-stop source for math manipulatives, classroom resources, educational games, calculators, STEM products, and teaching aides for pre-K-12. Stop by our booth to see our NEW products for 2018, watch exciting product demonstrations, enter to win prizes, and browse a selection of our most popular games and resources available for purchase. Come learn how EAI Education can create custom manipulative kits to complement your curriculum and SAVE your district funding.

EasyWorksheet.com

Booth 160

Alexandria, Virginia 301-758-3929

EasyWorksheet.com

EasyWorksheet.com is the #1 Rated Customized Math Test/Quiz/Homework Generator for grades 2–14. Our basic Teacher Account is FREE for teachers in the U.S. Products include customized test generators, custom online text books, online testing and student products, Math Puzzle Generators and puzzle worksheets based on your generated tests, math T-shirts, spinners, Common Core, and state products. We cover all objectives including Common Core and state mandated ones. Used in over 15,000 schools.

eMath Instruction, Inc.

Booth 348

Red Hook, New York 914-466-4327

emathinstruction.com

eMathInstruction creates innovative resources and offers full course curricular materials that align to the Common Core standards. Free lesson plans, homework sets, and YouTube videos take the guesswork out of teaching high school math. Kirk Weiler, the founder and creator of eMath, is a teacher who knows what other teachers find valuable. Kirk and eMath are engaging students like never before with over two million YouTube views and thousands of student followers on Instagram.

EMF Math by IMACS Booth 364

Plantation, Florida

emfmath.com/schools

EMF Math is an online curriculum for mathematically talented students in grades 6–8. EMF Math covers all of prealgebra through precalculus, as well as many university-level topics. Students who successfully complete the program may earn credits in algebra 1, algebra 2, geometry, and precalculus before they start high school and be ready to study Advanced Placement Calculus in ninth grade. For information on EMF in schools, visit http://www.EMFmath.com/schools.

ETA hand2mind

Booth 134

Vernon Hills, Illinois 847-968-5204

hand2mind.com

Children learn best by doing! Visit our booth to learn more about ETA hand2mind's most-loved programs and manipulatives. Discover simple solutions to integrate hands-on learning into your classroom for daily math practice, differentiated instruction, guided lessons, and more. Learn about fun, NEW ways to use the ETA hand2mind manipulatives you already have in your classroom and get a sneak peek at exciting new products, too

Eureka Math

Booth 452

Washington, D.C. 202-223-1854

eureka-math.org

Eureka Math (EngageNY) was written by teachers and mathematicians who took great care to present math in a logical progression from pre-K through grade 12. Eureka works to establish conceptual understanding first, to reduce gaps in student learning, and to instill persistence in problem solving, thereby preparing students to understand advanced math and apply it in the real world. Eureka Math is a full solution—a comprehensive curriculum, professional development, print materials, digital tools, and support.

Exemplars Booth 261

Underhill, Vermont 802-899-4409

exemplars.com

For 25 years, Exemplars has published math performance tasks for instruction and assessment. Our authentic material engages students and is differentiated at three levels. Our latest material, Problem Solving for the 21st Century, features newly developed tasks and classroom tools to support the implementation of problem solving. Planning sheets, rubrics, student anchor papers and assessment rationales are provided. Material supports and is aligned to state, national and Common Core standards.

ExploreLearningBooth 133

Charlottesville, Virginia 866-882-4141

explorelearning.com

ExploreLearning develops online solutions to improve student learning in math and science. ExploreLearning Gizmos are the world's largest library of interactive, online simulations for math and science in grades 3–12. ExploreLearning Reflex is the most powerful solution available for math fact fluency. Gizmos and Reflex bring research-proven instructional strategies to classrooms around the world.

F

FACEing MATH

Booth 564

Hemet, California 951-492-8341

FACEingMATH.com

We sell supplementary math books that are a unique blend of math and art. Our books are created by classroom teachers and are suitable for students in first grade through high school Algebra 2.

Family Math Night by Math Unity Booth 120

Rocklin, California 916-772 2788

familymathnight.com

Our focus at Math Unity is to build strong family-school partnerships through fun and engaging Family Math Night events. We do this through our ready-to-go Family Math Night kits. Each kit comes complete with everything needed to run a successful event and includes a nice balance of standards-based activities, projects, and games. Continuing the learning at home is also important so we also provide Take-Home kits filled with fun games. We make it easy to engage parents on an academic level!

First In Math – Suntex International Booth 140

Easton, Pennsylvania 610-253-5255

firstinmath.com

FIRST IN MATH® ONLINE: Building the M in STEM Suntex International has helped K–8 students build the M in STEM for more than 30 years, starting with the 24® Game and continuing with the First In Math® Online Program. FIM provides a rich platform to help students acquire, reinforce, and retain vital math skills. The innovation continues with the addition of our latest module, Computational Thinking World that includes coding! Visit us at booth 140 to hear about this new and exciting STEM resource.

Frog Publications

Booth 465

San Antonio, Florida 800-777-3764

frog.com

Systematic reinforcement programs, individualized educational plans, response to intervention, differentiated instruction, terrific and ready-to-use learning centers, take-home parental involvement program, daily review, critical thinking, and dual language! All Frog games use the same easy-to-learn rules. Students needing different levels or skills can practice together!

G

Get More Math

Booth 652

Quarryville, Pennsylvania 814-932-5440

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! GMM builds math practice sessions for each student that include both new material and thorough review of old concepts and skills. Every day, a student logs into a new mix of practice problems, assigned by her teacher and selected for her based on data collected during all her former sessions.

Geyer Instructional Products Booth 152

Cincinnati, Ohio 513-527-2462

geyerinstructional.com

We offer a complete line of math aids, math supplies, and math equipment for the middle and high school classroom. Many of our products are exclusively produced by Geyer! We specialize in graph paper, graphing and measurement tools, dry erase products, and posters. We also carry books, games, and general school supplies. Purchase Orders Accepted. Check us out online at www.geyerinstructional.com.

GradeCam

Booth 116

Livermore, California

gradecam.com

Grade assignments instantly with virtually any webcam or mobile device. #GradeFast #GradeSmart @Gradecam Find out more at www.gradecam.com.

Н

Heritage Treasures Booth 643

Ashburn, Virginia

htprintables.com

We offer first-quality screen printing and embroidery services for schools, family reunions, community- and civic-based organizations, specializing in T-shirts and textile apparel and related accessories. We offer a wide array of promotional products for every occasion and special events designed to bring recognition and lasting impressions.

Houghton Mifflin Harcourt/ Heinemann

Booth 333

Austin, Texas 212-343-6969

hmhco.com

Houghton Mifflin Harcourt is a global learning company dedicated to changing people's lives by fostering passionate, curious learners. As a leading provider of pre-K-12 education content, services, and cutting-edge technology solutions across a variety of media, HMH enables learning in a changing landscape.

HP Inc. Booth 124

San Diego, California 619-677-8049

hp.com/go/hpprime

HP Prime is a full-color, multi-touch graphing calculator designed with an app-based interface including subject-specific apps for middle school, high school, and college courses. Features include: just-in-time context-sensitive help, pinch-to-zoom, advanced graphing, optional Reverse Polish Notation (RPN), multidimensional Computer Algebra System (CAS), and more. The HP Prime Ecosystem allows teachers to share data, conduct instant polls, create apps, view student calculator screens, and more.

I

ICME-International Congress of Mathematics Educators

Booth 481

East Lansing, Michigan 517-410-3115

msu.edu

Curious about the ICME conference? Stop by and chat with past participants to learn about their experiences and get information on ICME-14, in Shanghai, China, the summer of 2020. Learn about the upcoming application process and travel awards. Be part of a fantastic international conference and experience!

Imagine Learning Inc

Booth 660

Provo, Utah 801-377-5071 x4434

Imagine Math is a rigorous and adaptive supplemental math curriculum that supports Student-Centered Learning. IM offers live 1:1 differentiated instruction from Certified Math Teachers. Students with limited success can develop the essential foundations and conceptual understanding needed to confidently move forward. Through our adaptiveness, students learn in their zone of proximal development. Learning is supported by meaningful practice and the application of knowledge at the conceptual level.

J

Japan Math Corp Booth 232

Chicago, Illinois

312-631-3750

japan-math.com

We are the U.S. subsidiary of a leading provider of learning materials in Japan, founded in 1933. For over 80 years we have been supporting the advancement of Japanese public education. Our mission is to provide quality education to children in all kinds of environments. Education fosters our children, and paves the way for our society's future. Here at Japan Math Corp., we provide high-quality education and learning materials for children to help them build a brighter future.

Johnny's Key

Booth 569

Trevorton, Pennsylvania 570-809-2840

JohnnysKey.com

Johnny's Key, founded in 2010, has helped thousands of teachers and students understand/model difficult math concepts such as elapsed time, making change, subtraction with regrouping, ratio/proportion, equality, and ordering of numbers, fractions, decimals, and percents. Founder Barbara Spotts provides professional development to teachers nationwide on topics such as How to Take Charge of Your Own Professional Development, What Math Class Should Look and Sound Like, and Questioning Strategies.

Johns Hopkins Center for Talented Youth

Booth 656

Baltimore, Maryland 410-735-6133

cty.jhu.edu/jobs/summer

For over 30 years, the mission of Johns Hopkins University Center for Talented Youth has been to develop academic programs for talented elementary, middle, and high school students. We are seeking outstanding staff to work as mathematics instructors, teaching assistants, and administrators in summer programs at locations across the country.

K

Kamico Instructional Media

Booth 461

Austin, Texas 254-947-7283

kamico.com

Touch the life of a child—and impact the future of our country. KAMICO has been creating research-based educational materials for almost 30 years including English and Spanish assessments for K-12, hands-on games and activities, RTI materials, and online tools to track and analyze academic data, as well as to create instructional groups based on academic needs. KAMICO also provides professional development tailored to meet the individualized needs of districts, schools, and educators.

Kendall Hunt Publishing CompanyBooth 373

Dubuque, Iowa

563-589-1075

k12.kendallhunt.com

Kendall Hunt develops digital and print mathematics curriculum for pre-K–grade 12. Offering both complete grade-level and supplemental programs, we focus on helping all students become mathematically proficient and college- and career-ready.

Knowledge Tools, Inc.

Booth 645

Newport Beach, California **knowledge-tools.com**

Knowles Teacher Initiative

Booth 173

Moorestown, New Jersey

knowlesteachers.org

The Knowles Teacher Initiative, a 501(c)(3) nonprofit, was established by Janet H. and C. Harry Knowles in 1999 to increase the number of high-quality high school science & math teachers in the U.S. Through the Teaching Fellows Program, Senior Fellows Program, and the Knowles Academy, Knowles seeks to support a national network of math and science teachers who are collaborative, innovative leaders improving education for all students in the U.S. Visit www. knowlesteachers.org to learn more.

L

Lakeshore Learning Materials

Booth 547

Carson, California 800-421-5354

LakeshoreLearning.com

Lakeshore Learning Materials is one of the leading manufacturers of K–6 math resources—including in-depth teaching products focused on developing mathematical reasoning and problem-solving skills. We also offer hundreds of other items that support daily instruction and intervention strategies in the classroom, and help educators make math relevant to students.

Learning Wrap-Ups Booth 371

Layton, Utah 801-497-0050

learningwrapups.com

Learning Wrap-Ups, Inc. is the developer and publisher of Learning Wrap-Ups, Learning Palette, and Learning Palette Online. These unique products have been developed to assist the K–5 student with development of fact fluency, and conceptual understanding of important Math skills. The products of Learning Wrap-Ups have been utilized in the classroom for over 30 years and have been called the "best learning center products" available.

LearnZillion

Booth 561

Washington, D.C. 415-497-9886

learnzillion.com

LearnZillion provides subscription-based, digital-first ELA and math curriculum to K–12 school districts. The curriculum is authored by LearnZillion's Dream Team of top teachers from across the country and high-quality content partners like Illustrative Mathematics. LearnZillion's LTI and Common Cartridge integrations allow districts to seamlessly provide their teachers with easy-to-use instructional materials that can be delivered directly into an LMS.

Lone Star Learning

Booth 568

Lubbock, Texas 806-281-1424

lonestarlearning.com

Lone Star Learning is a curriculum-development company offering unique, easy-to-use visuals and interactive bulletin boards that give students the specific practice needed to achieve mastery in math, science and language arts. Lone Star Learning is the proud winner of *Learning Magazine*'s Teachers Choice Award for three years' running. We strive to increase student success while decreasing teacher effort with our innovative products! We hope to become an integral part of your classroom!

M

Mangahigh.com

Booth 361

London, England 877-626-4244

mangahigh.com

Mangahigh is an adaptive, standards-aligned, supplemental math program that sets the standard for game-based learning across K–10. The device's agnostic platform supports learning through in-the-moment feedback, personalized hints, and interactive tutorials. It invites risk-taking and supports growth mindset through reframing mistakes as opportunities to try again. The unique reporting framework focuses on demonstrating understanding, not chasing grades. Get your FREE trial: www.mangahigh.com

Marshall Cavendish Education Booth 268

Tarrytown, New York

914-332-8888

mceducation.us

Marshall Cavendish Education is a global provider of holistic education curricula that help teachers become facilitators and students to be critical thinkers. The company's products are published in 11 languages, in more than 50 countries, and are used by K–grade 8 educators and students. Marshall Cavendish Education is revolutionizing learning and teaching with the Singapore Math® Approach, which uses the concrete, pictorial, and abstract (CPA) learning progression.

Math&Movement

Booth 571

Ithaca, New York 607-233-4209

mathandmovement.com

Math&Movement is a kinesthetic, multisensory approach to teaching math that incorporates physical exercise, stretching, cross-body movements, yoga, and visually-pleasing floor mats designed to encourage students to practice math concepts. The Math&Movement program allows students to physically hop, walk, crawl, dance, or touch the mats as they learn thus using more learning modalities (visual, auditory, motor, and kinesthetic) when practicing.

Math for America

Booth 363

New York, New York 646-437-0904

MathForAmerica.org

Math for America (*Mf*A) brings together outstanding science and mathematics teachers and connects them to one another for collaboration and ongoing learning, inspiring them to stay in the classroom, define excellence in their profession, and amplify their impact. Learn more about *Mf*A's fellowships at MathForAmerica.org.

Math Solutions

Booth 233

Sausalito, California 800-868-9092

mathsolutions.com

Math Solutions, founded by Marilyn Burns, has been transforming instruction for over 30 years by providing the highest quality professional learning, resources, and coaching to improve mathematics instruction and student proficiency. With partnerships across schools and districts nationwide, Math Solutions offers comprehensive professional learning to transform curriculum and instruction, while preparing students for the rigorous expectations of college and career.

Math Stackers, Inc

Booth 123

Houston, Texas 940-399-6555

mathstackers.com

Math opens young minds to new ways of thinking about, interacting with, and understanding the world. As we teach kids to think mathematically, we empower them to be forward thinkers. We believe math is an active exploration filled with creativity and should be experienced and discovered while playing and having fun. As an educational startup, our offering to empower kids comes in the form of specially designed mathematical foam blocks and interactive activities to discover the properties of math.

Math Teachers' Circle Network Booth 474

San Jose, California 408-350-2088

mathteacherscircle.org

Math Teachers' Circles (MTCs, www.math-teacherscircle.org) are professional communities of K–12 mathematics teachers and mathematicians. Groups meet regularly to work on interesting mathematics problems, allowing teachers to enrich their knowledge and experience of math, while building meaningful partnerships with other teachers and mathematicians. Founded in 2006, the Math Teachers' Circle Network is a project of the American Institute of Mathematics (AIM, www.aimath.org).

Math Teachers Press

Booth 154

Minneapolis, Minnesota 800-852-2435

movingwithmath.com

Provides pre-K–12 formative assessment and conceptual instruction using concrete manipulatives with research-based strategies and proven results. Includes the four essential elements of RTI: screening, decision making, explicit instruction, and progress monitoring. Instruction integrates the concrete-representational-abstract (CRA) pedagogy with scripted lesson plans providing embedded PD. Objectives are correlated to state and national standards. Proven achievement gains. Optional Web-Based Technologies.

Mathalicious

Booth 360

Austin, Texas 530-420-5474

mathalicious.com

61% of middle schoolers would rather take out the garbage than do math homework. For them, math isn't just a chore . . . it's worse! But it doesn't have to be that way. Mathalicious offers engaging real-world lessons and projects aligned to Common Core State Standards for middle and high school. Lessons promote the CC Standards for Mathematical Practice by providing opportunities for students to think critically and creatively, develop arguments, and critique the reasoning of others.

MATHCOUNTS Foundation

Booth 362

Alexandria, Virginia 703-299-9006

mathcounts.org

MATHCOUNTS provides fun and engaging programs for sixth-, seventh-, and eighthgrade students. Through three 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! Pick up your Club in a Binder today to get fun math games to use in your club and classroom.

MathLine at Howbrite SolutionsBooth 468

Cokato, Minnesota 320-286-2597

howbrite.com

MathLine is a blended learning strategy offering a multisensory tool for students and an interactive whiteboard tool for teachers to teach K–5 math. Common Core essentially focuses on deeper comprehension of targeted math concepts which is precisely MathLine's greatest asset! iMathLine will increase your teacher's confidence teaching math as it is an easy-to-use support strategy. Come learn how you can achieve your Common Core objectives and raise your math scores.

MathOdes Company Booth 570

Festus, Missouri 314-717-8577

mathodes.com

MathOdes Company designs fun and creative math teaching and study aids for middle and high school! A rhyming format helps students remember math concepts and formulas through poetry, music, and color illustrations. Each "ode" details a particular math concept such as surface area, polynomials, and matrices. Algebra 1, Algebra 2, and Geometry products are currently available. Our first novel, *The Trigonometry Tryst*, humanizes the six trigonometric functions. Check out this delightful read!

MathScribe

Booth 269

Berkeley, California

mathscribe.com

Mathscribe provides free interactive textbooks for Algebra 1 courses covering the Common Core standards. Our textbooks utilize guided discovery, dynamic graphing, instant feedback, and adaptive exercises. Students can vary parameters using sliders, observe resulting changes both graphically and numerically, answer questions about the changes, and see their answers checked, all in real time. All exercises and tests are graded automatically.

Mathspace

Booth 531

New York, New York 718-510-2582

mathspace.co

Come see something truly different! Mathspace is the world's ONLY app that allows students to show all their work step-by-step for every question, writing naturally into their iPad, or in a web browser. Our feedback at every intermediate step of a question is like having a teacher side-by-side with the student, and our adaptive learning personalizes their math journey. So if you always say, "HOW you got the answer is as important as the final answer," come speak to us about a free trial!

McGraw-Hill Education

Booth 101

Columbus, Ohio 614-430-4482

mheducation.com

McGraw-Hill Education is the digital learning experiences company intent on changing the world of education. Drawing on its rich heritage of educational expertise, the company offers highly personalized learning experiences that improve learning outcomes around the world. The Company has offices across North America, India, China, Europe, the Middle East, and South America, and it makes its learning solutions available in more than 60 languages.

Michigan State University Booth 144

East Lansing, Michigan 517-355-1708

prime.natsci.msu.edu

The doctoral program in mathematics education at Michigan State University is designed for those who show promise of becoming leaders in local, state, national, and international mathematics education communities. We prepare researchers and leaders to address critical mathematics education issues by developing analytical perspectives for research, engaging in reflective teaching, and deepening mathematical knowledge. Assistantships and fellowships are available!

Minitab Inc.

Booth 460

State College, Pennsylvania 800-448-3555

minitab.com

Minitab® is the leading software for statistics education worldwide, and can be purchased via affordable semester rentals. Minitab is easy to use, with a comprehensive set of tools and powerful graphics capabilities that let you create stunning and informative graphs that bring data to life. Minitab integrates into curriculums seamlessly and affordably, and it is the package of choice at more than 4,000 colleges and universities. Visit www.minitab.com/academic.

MOEMS

Booth 125

Bellmore, New York 516-781-2400

moems.org

Math Olympiads is a not-for-profit corporation dedicated to stimulating enthusiasm, fostering creativity and strengthening intuition in mathematical problem solving. Through the use of five monthly contests, teachers and teams of up to 35 students explore and review mathematical concepts while developing flexibility in solving nonroutine problems. Certificates, medals, or trophies are awarded to all participants. Visit our booth for information, sample problems, and prizes.

MQI Coaching

Booth 639

Cambridge, Massachusetts 781-373-7068

mqicoaching.org

We offer MQI Coaching, a math-specific coaching model that can help improve the quality of mathematics instruction in schools and districts. The Mathematical Quality of Instruction (MQI) instrument is a Common Core-aligned, math-specific rubric from Harvard University that provides teachers with a framework for analyzing and improving their math instruction. We offer training and support for coaches as well as direct, videobased coaching for teachers. Learn more at mqicoaching.org!

N

Nasco

Booth 147

Fort Atkinson, Wisconsin 920-563-2446

eNasco.com

Nasco is proud to supply all the materials necessary for successful hands-on math programs. We have the latest mathematics teaching aids, supplies and equipment for elementary, middle school, and secondary math programs. Nasco has products that are aligned to today's rigorous standards and target STEM initiatives that engage 21st-Century Learning. We are skilled at creating cost-effective, customized kits to meet your classroom needs.

NASGEm: North American Study Group on Ethnomathematics Booth 165

Estes Park, Colorado 970-371-0167

nasgem.org

D'Ambrosio and others coined "ethnomathematics" to describe math practices of identifiable cultural groups. More broadly, it can refer to those of larger groups also of small sects. Mathematical practices include symbolic systems, spatial designs, practical construction techniques, algorithms, measurement, ways of reasoning, and so on, for which formal representation is possible. NASGEm & T2T-Global promote culturally responsive math education practices.

National Assessment of Educational Progress (NAEP)

Booth 557

Washington, D.C. 202-842-3600

nationsreportcard.gov

The National Assessment of Educational Progress (NAEP) is the largest continuing and nationally representative assessment of what students across the United States know and can do. NAEP is administered by the National Center for Education Statistics within the U.S. Department of Education. The results are released as The Nation's Report Card.

National Geographic Learning Cengage Learning

Booth 222

Boston, Massachusetts 617-757-8075

ngl.cengage.com

National Geographic Learning, a part of Cengage, provides quality pre-K-12, academic, and adult education instructional solutions for subjects such as reading, science, social studies, mathematics, world languages, and ESL/ELD; advanced, honors, electives, career, and technical education; and professional development. See our new catalog at NGL. Cengage.com/catalogs.

National Museum of Mathematics Booth 475

New York, New York 212-542-0566

momath.org

Come visit the National Museum of Mathematics to learn how you can win \$25,000! The Museum runs an annual contest for innovative math lessons, and we want YOU to participate: rosenthalprize.momath.org. We'll also have some unique math manipulatives to share that help math come alive.

National Science Foundation Booth 379

Arlington, Virginia 703-292-5120 **nsf.gov**

NCSM

Booth 169

Aurora, Colorado 720-250-9582

mathedleadership.org

NCSM is a mathematics leadership organization for educational leaders that provides professional learning opportunities necessary to support and sustain improved student achievement. NCSM envisions a professional and diverse learning community of educational leaders that ensures every student in every classroom has access to effective mathematics teachers, relevant curricula, culturally responsive pedagogy, and current technology.

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Ohio Council of Teachers of Mathematics

Booth 161

Stow, Ohio 513-674-4216

ohioctm.org

The Ohio Council of Teachers of Mathematics (OCTM) promotes quality teaching and learning of mathematics in Ohio by supporting educators and their professional growth, fostering collaboration, and advocating for informed public policy. OCTM strives to be a highly valued community in which teachers of mathematics can grow professionally in order to foster deep mathematics understanding for all learners. Visit OCTM's booth to learn about Ohio's efforts and upcoming learning opportunities.

Origo Education

Booth 539

Earth City, Missouri 314-475-3061

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 and students. Our diverse selection of products bring a renewed enthusiasm to students' learning experiences.

P

Pearson

Booth 115

Chandler, Arizona 480-316-0210

PearsonEd.com

As the leading education company, Pearson is serious about evolving how the world learns. We apply our deep education experience and research, invest in innovative technologies, and promote collaboration throughout the education ecosystem. Real change is our commitment, and its results are delivered through connecting capabilities to create actionable, scalable solutions that improve access, affordability, and achievement. For more information, visit www.pearsoned.com.

Perfection Learning

Booth 462

Logan, Iowa 800-831-4190

perfectionlearning.com

For over 90 years, Perfection Learning has been a leader in reading, literature, and language arts programs with both textbook and supplemental programs. Our math programs feature cutting-edge digital math programs for high schools and higher education; preparation for AP®, ACT, and SAT exams; practice for end-of-course exams and Common Core standards; programs for English Language Learners; and more.

PhET Interactive Simulations Booth 369

Boulder, Colorado 303-492-6963

phet.colorado.edu

Interact, Discover, Learn. PhET simulations actively engage students in math and science, impacting millions of students today and pioneering innovations in teaching, learning, and assessment. Our new HTML5 sims run in any modern web browser including iPads and Chromebooks and are translated into over 50 languages. Visit PhET at booth 369 to get a sneak peek of new math simulations in development!

Polyup

Booths 535 & 653

Sunnyvale, California 650-269-2378

polyup.com

Polyup is a free and open platform that allows students to experiment with numbers and functions in a visual environment. You can use Polyup in your class to engage students in problem solving and computational thinking. Polyup is organized into "Poly Machines," activities of varying difficulty for third to twelfth graders. You can scan activities from our website or even develop your own Poly Machines for your students. Polyup is empowering the next generation of problem solvers. Be a part of it!

R

Really Good Stuff

Booth 657

Moore, Connecticut 800-366-1920 reallygoodstuff.com

Renaissance Learning

Booth 127

Wisconsin Rapids, Wisconsin 715-424-3636

renaissance.com

Daily and periodic progress-monitoring assessments provide teachers with vital information about each student's math-skills development by combining Renaissance LearningTM software, such as Accelerated MathTM, Accelerated Math FluencyTM, and STAR MathTM, and classroom-proven best practices. The result: dramatically improved math skills for grades 1–12 students.

S

Sadlier

Booth 553

New York, New York 800-221-5175

SadlierSchool.com

For more than 60 years, Sadlier has developed high-quality K–8 math programs. Sadlier Math, new for K–grade 6, reflects the keystones of mathematical learning through a systematic instructional approach, abundant real-world STEAM applications and problem solving, and innovative support for teaching and learning. Progress Mathematics, a supplemental K–8 program, provides a variety of pathways to improve student learning and outcomes. Both programs offer dynamic digital tools to enrich learning.

Savannah College of Art and Design Booth 374

Savannah, Georgia 912-713-9583

scad.edu

Offering the most art and design degrees of any university in the U.S., with more than 100 programs of study across more than 40 majors and 70 minors, SCAD prepares talented students for thriving creative careers. The innovative SCAD curriculum is enhanced by cutting-edge technology and learning resources, as well as opportunities for internships, professional certifications, and collaborative projects with industry partners—including BMW, Coca-Cola, Google, NASA, and more.

Search Associates

Booth 478

University Place, Washington 253-301-4027

searchassociates.com

Search Associates is the largest recruitment organization in international K–12 education. Since 1990, we have helped more than 26,000 educators find positions at K–12 schools around the world. Our 600+ member schools have English as the language of instruction and generally offer American, British, or International Baccalaureate academic programs. We believe our success stems largely from our highly personalized approach to both schools and candidates. See www.searchassociates. com for more info.

Shing Lee Publishers Pte Ltd Booth 626

Kewalram Hillview, Singapore 659-008-0882

shinglee.com.sg

Shing Lee Publishers is a leading publisher of educational books, interactive books and digital platforms in Singapore and in more than 40 countries worldwide. In line with the latest technology, our systematically structured books such as our latest think! Mathematics series are available in print and online. We also offer a wide range of professional development courses to support educators during their teaching journey.

Singapore Math Inc.

Booth 109

Tualatin, Oregon 503-557-8100

SingaporeMath.com

Singapore Math Inc. is dedicated to bringing the highest quality educational resources to the U.S. and Canada. These resources include a range of selected core curricula and supplemental titles. We welcome you to come by booth 109 to peruse Singapore Math® books and to learn more about the Singapore approach to teaching and learning mathematics.

Solution Tree

Booth 260

Bloomington, Indiana 800-733-6786

solution-tree.com

Solution Tree delivers comprehensive professional development to schools and districts around the world. Solution Tree has empowered K–12 educators to raise student achievement through a wide range of services and products including educator conferences, customized district solutions for long-term professional development, books, videos, and online courses. Last year, more than 25,000 educators attended Solution Tree events on professional learning communities, RTI, assessment, and other topics.

ST Math, created by MIND Research Institute

Booth 347

Irvine, California 888-751-5443

stmath.com

Spatial-Temporal (ST) Math® is a visual instructional program that builds a deep conceptual understanding of math through rigorous learning and creative problem solving to engage, motivate and challenge pre-K-8 students toward higher achievement. Studies across a wide variety of student groups continue to demonstrate ST Math's efficacy in building lifelong learners prepared for success in STEM. ST Math currently reaches more than 1.2 million students. For more information, visit stmath.com.

Stenhouse Publishers

Booth 153

Portland, Maine 800-988-9812

stenhouse.com

Stenhouse provides quality professional development resources by teachers, for teachers. Our goal is to offer educators a set of proven strategies from which they can choose and adapt what will work best for their students and in their own environment.

SumBlox Group

Booth 635

Paradise, Utah

SumBlox Group is the creator of the revolutionary math manipulative, SumBlox Building Blocks. This premier STEM toy allows children to visualize the value of numbers through height, making elementary math concepts significantly easier to grasp and remember. The concept was developed in 2012 by B. David Skaggs while volunteer tutoring elementary mathematics. The company's mission is simply to improve early math education and inspire a love of mathematics in children everywhere.

Т

Taylor & Francis Group Booth 270

Philadelphia, Pennsylvania 215-625-8900

taylorandfrancis.com

For two centuries, Taylor & Francis has been fully committed to the publication of scholarly research. We publish a wide variety of journals relevant to the fields of teaching, mathematics, and teaching mathematics. Visit us online at www.tandfonline.com or visit the Taylor & Francis Journals booth to learn about our products and services, and to request FREE sample copies of our journals.

Teacher Created Materials Booth 247

Huntington Beach, California 800-858-7339

tcmpub.com

Teacher Created Materials develops innovative and imaginative educational materials and services for students worldwide. Everything we do is created by teachers for teachers and students to make teaching more effective and learning more fun.

TEALS through Microsoft Philanthropies

Booth 472

Redmond, Washington 425-681-4804

TEALSK12.com

TEALS uses software developer volunteers to train high school classroom teachers in computer science during the first period of the school day. Volunteers come into the classroom every day and teach computer science courses while the classroom teacher learns the material. After one to two years, 85% of TEALS classroom teachers can lead the class on their own. Experienced CS teachers can also be paired with professional software volunteers who can provide additional lab support.

TERC

Booth 370

Cambridge, Massachusetts 617-873-9600

arc adıı

For over fifty years, TERC has been introducing millions of students throughout the United States to the exciting and rewarding worlds of math and science learning. Led by experienced, forward-thinking math and science professionals, TERC is an independent, research-based organization dedicated to engaging and inspiring all students through stimulating curricula and programs designed to develop the knowledge and skills they need to ask questions, solve problems, and expand their opportunities.

Texas Instruments

Booth 424

Dallas, Texas 214-567-6409

education.ti.com

TI provides free classroom activities that enhance math, science, and STEM curricula; technology that encourages students to develop a deeper understanding of concepts; and professional development that maximizes your investment in TI technology. TI offers handhelds, software, apps for iPad®, and data collection technology, designed to promote conceptual understanding, and formative assessment tools that gauge student progress. Visit education.ti.com.

NCTM Needs You!

CTM has strength in numbers as the world's largest mathematics education organization. But your active participation gives important mathematics education issues the face and voice needed to effect change.

NCTM needs you to get involved and help work with policymakers and the public at the national, state, and local levels. NCTM supports your advocacy work with toolkits to help you get started.

Every Student Succeeds Act (ESSA) Toolkit

The Every Student Succeeds Act (ESSA) is the education law that is replacing No Child Left Behind. It's restructuring how and where federal money for education is allocated. Learn how you can take action on state plans for spending ESSA funds.

nctm.org/essatoolkit/

NCTM's Advocacy Toolkit

This toolkit provides basic tools for you to act on issues that affect educators, students, schools, and mathematics education. The toolkit includes an NCTM Communications Guide to help you get started. The guide offers tips on interacting with legislators and legislative staff. Important information about NCTM is included.

nctm.org/advocacy/

TAKE ACTION NOW by using NCTM's advocacy tools and resources. Your membership makes these resources possible. Your involvement makes quality mathematics education a reality.







The Actuarial Foundation/ **Be An Actuary**

Booth 368

Schaumburg, Illinois 847-706-3535

actuarialfoundation.org and beanactuary.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! Be An Actuary "Actuary" is consistently one of the mostly highly rated career opportunities available for students that excel in math and business. There are limitless opportunities: www.beanactuary.org.

The MarkerBoard People Booth 630

Lansing, Michigan 800-379-3727

dryerase.com

Student dry erase markerboards and response boards in class sets. Great for instant response and instant assessment. Unbeatable prices! Single- and double-sided available. Perfect for math, science, language arts, graphing, handwriting, and more. Long-lasting, non-toxic, ultra-low odor markers too!

The Math Learning Center Booth 241

Salem, Oregon 800-575-8130

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.

TODOS: Mathematics for ALL Booth 159

Tempe, Arizona 480-515-5265

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. Our 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.



Help NCTM Help Teachers

SUPPORTING TEACHERS... REACHING STUDENTS... BUILDING FUTURES

NCTM's Mathematics Education Trust (MET) channels the generosity of contributors through the creation and funding of grants, awards, honors, and other projects that support the improvement of mathematics teaching and learning.

MET provides funds to support classroom teachers in the areas of improving classroom practices and increasing mathematical knowledge; offers funding opportunities for prospective teachers and NCTM's Affiliates; and recognizes the lifetime achievement of leaders in mathematics education.

If you are a teacher, prospective teacher, or school administrator and would like more information about MET grants, scholarships, and awards, please:

- Visit our website, www.nctm.org/met
- Call us at (703) 620-9840, ext. 2112
- Email us at exec@nctm.org

Please help us help teachers! Send your tax-deductible gift to MET, c/o NCTM, P.O. Box 75842, Baltimore, MD 21275-5842. Online donations also are welcome at **www.nctm.org/donate**. Your gift, no matter its size, will help us reach our goal of providing a high-quality mathematics learning experience for all students.

The Mathematics Education Trust was established in 1976 by the National Council of Teachers of Mathematics (NCTM).



U

US Math Recovery Council

Booth 271

Apple Valley, Minnesota 952-683-1521

mathrecovery.org

The US Math Recovery Council®, a non-profit, provides professional development and research on children's mathematical thinking. We increase educators' confidence in numeracy and pedagogical knowledge to enhance student achievement. Math Recovery® Intervention Specialist provides assessment and intensive intervention. Add+VantageMR® courses include assessment and instruction, focusing on using data to differentiate and apply Math Recovery® strategies to large and small group instruction.

W

WeDu Communications

Booth 265

Mapo-gu, Seoul, South Korea 82231537460

wedu.co.kr

WeDu communications has been continually growing since 2003 to keep up with the rapidly changing educational environment by producing innovative contents. Having completed successful projects in a variety of areas, we have been recognized internationally, we will continue to grow as a company that constantly researches for more efficient, more pleasing ways to provide service for our customers.

Wiley

Booth 473

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3
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CPM Educational Program12
Didax EducationCoupon 233
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Houghton Mifflin Harcourt 101, Wednesday Tab (Front and Back)
HP Inc Thursday Tab (Back), Coupon 239
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MEMBERSHIPAdvocacy223Mathematics Education Trust (MET)170, 224NCTM Membership84NCTM CentralThursday Tab (Front)
PROFESSIONAL DEVELOPMENT NCTM Professional Learning Services 188 NCTM MyNCTM. 157 NCTM Online Learning Events 147
PUBLICATIONS New Books 37 Catalyzing Change 15 NCTM Bloom Into Spring 45 Principles to Actions Toolkit 138
SESSIONS



A	Benzing, Andrew 354	Caniglia, Joanne 535	Cullen, Amanda 26
Abassian, Aline 349	Berg, Sandi 595	Canzone, Janna 202, 472	Curran, Beth 576
Abel, Todd 144	Berger, Anne 275	Cape, Elizabeth 294, 462, 581	Curran, Danielle 636
Actuarial Foundation, The/	Berray, John 558	Capper, Jean 508	Curran, Elizabeth 615
BeAnActuary 200.4	Berry, III, Robert 439, 557	Capraro, Karen 656	Curtis, Jennifer 69, 317
Adams, Antonia 599	Beske, Barbara 348	Cardone, Tina 86	Cutler, Carrie 321, 532
Addison, Jessica 233	Beyranevand, Matthew 484	Carli, Melissa 643	Cutler, Sara
	,	Carlson, Marilyn 276	Cutici, Bara
Agostinelli, Anne 151	Bhowmick, Nandini 401		D
Ahrendt, Sue 213	Big Ideas Learning 613.3	Carnevale, Mary Ann 479	Dabovic, Nikolina
Alcorn, Meghan 370	Bigelow, Amy 367	Caroland, Molly 20	Dairyko, Mary Ellen 291
Alderman, Betsy 148	Billings, Esther 181	Carr, Martha 355	
Allen, Loria 485	Binkowski, Andrew 466	Carson-Dellosa Publishing Co.	Daley, Molly 237
Allexsaht-Snider, Martha 132	Birkhead, Sara 471		Danielson, Christopher 536
Allman, Emily 263	Bissey, Lisa 517	Cartwright-Punnett, Lynn 262	Day, Roger 61
Allsopp, David 186	Black, Ashli 152	Casa, Tutita 149.1, 238, 627	de Araujo, Zandra 388
Alperin, Michelle 105	Blackmon, George 121	Casio America, Inc 146.4	Dean, Brian 16
Amidon, Joel 504	Blanton, Maria 241, 637	Cassaro, Michael 526	Dean, Geoff 660
	Board of Directors, NCTM 1, 3	Caulfield, Nicole 204	Decovsky, Fred 36
Anderson, Bryan 396			DeCrescenzo, Alysha 475
Anderson, Cathryn 216	Bobo, Jessica	Celedón-Pattichis, Sylvia 4	Deichert, Deana 568
Anderson, Nancy 429	Bogart, Denise	Cerrahoglu, Vanessa 182, 560	Dellamano, Ruby 188
Andreasen, Janet 150, 424, 643	Bonin-Ducharme, Jules 579	Chamberlain, David 10	
Andrews, Delise 149, 207, 621	Boone, Chandra 617	Champagne, Zachary 323, 380	DeLong, Adrienne
Ani, Karim 47	Booth, Samantha 460	Chapman, Susan 292	DenBesten, Wendy 332
Anthony, Kristina 191	Borchelt, Carly 411	Chase, John 146	Dennett, Emily 73
Aparicio, Silvia 50	Borchelt, Nathan 403	Chatfield, Rayna 322	DeWall, Traci 372
Appelgate, Mollie 170	Boston, Melissa 333	Chelst, Kenneth 173	Diamantis, Maria 459, 552
Armstrong, Cal 601	Boswell, Laurie 583	Cheng, Diana 650	Dick, Thomas 195, 326
Arora, Alka 609	Boutin, Catherine 96	Cheng, Ivan 129, 498	Dickey, Ed 420, 544
	Bower, Rachel	Chien, Lawrence	Dillon, Frederick 65, 519
Asempapa, Reuben 110, 452		Chinen, Starlie	Diniz, Jill
Ashurst, John	Boyer, Laurie		Dituri, Philip 54
Atit, Kinnari 355	Braddock, Lenette 301	Chlest, Kenneth 594	Dixon, Juli 87, 557, 643
Atkins, Sandy 171	Bragg, Jason	Cho, Hoyun 645	Dobson, Cred
Attard, Catherine	Brahier, Daniel 82	Chokshi, Shephali 140, 335	
Austin, Kate 383	Brahier, John 82	Christensen, Cameron 646	Donald, Kendall 631
Azmy, Christina 77	Brakoniecki, Aaron 139	Christopherson, Robb 660	Donavan, Kristie 218
	Bray, Wendy 243	Cirillo, Michelle 217, 278, 483	Doubet, Kristina 580
В	Brehm, Jacklyn 475	Clark, Lisa 609	Dougherty, Barbara 336
Bagnall, Jessie 529	Bressoud, David 32	Clark-Garvey, Liz 169	Douglas, Lew 473
Baker, Angela 358	Brewrink, Matthew 476	Claydon, Jonathan 421	Doyle, Nolan
Baldridge, Scott 190, 231	Briars, Diane 91, 249, 557	Clayton, James 185	Drelick, Brian 606
Balli, Jessica 259	Broaddus, Angela 183	Clemmer, Kathy 384, 661	D'Souza, Susan
Bandemer, Karla 149, 451	Brodney, Bruce	Cliche, Cynthia 481	DuCloux, Kanita 194, 574, 626
Barger, Rita 496		, ,	Duerksen, Laurie 506
Barnes, David 49, 215, 518	Brodney, Sandra 29	Clody, Ashley 44, 224	Duggan, Jessica 649
Barnett, Joann 623	Brown, Curtis 196, 248	Coaty, Matt 400	Dunbar, Bridget 540
*	Brown, Kyndall 155	Coe, Kristi	
Barr, Kelly 372	Buchheister, Kelley 575	Coffey, David 507, 618	Dupree, Lakesia 364
Barraugh, Andrea 212	Buckhalter, Brian 561	Coffey, Margaret 61	Dyer, Heather 20
Barrett, Martha 218	Buckner, Barbara 161	Coffey, Kathryn 181, 507, 618	Dykema, Kevin 486
Barry, Meka 41	Bull, Rachelle 278	Cohen, Alona 17	E
Battista, Michael 487	Burke, Rachel 477	Collier, Shawn 141	
Battle, Renee	Burns, Marilyn 242	Collins, Christi 184	Eager Leavitt, Arielle 27
Baumann, Tammy 220	Burrill, Gail	Colonnese, Madelyn 238, 627	Earley, Nathan
Bay-Williams, Jennifer	194, 195, 246, 326, 420	Columba, Lynn 325	Eckel, Malcolm
35, 72, 223, 302	Bush, Sarah	Conner, AnnaMarie 608	Eddings, Aminah
Bedford, Freeman & Worth			Edenfield, Kelly 441, 642
Publishers	Bushart, Brian	Conner, Kimberly 410	Edwards, Michelle 614
578.3, 613.1, 613.2, 648.1	Bussiere, Brian 283	Cook, Kristin	Edwards, Thomas 173, 594
	Butler, Jedidiah 539	Copley, Juanita	Ehly, Kevin 17
Bedtime Math Foundation	Butler, Libby 55	Cornelius, Virginia 351	Eisenreich, Heidi 236
	Butler Wolf, Nancy 382	Cortado, Kriselyn 654	Eli, Jennifer 527
Becht, Maria	C	Costanzo, Jennifer 514	Eller, Kyle 65, 519
Beckford, Michele 662	C	Cox, Richard	Ellington, Roni
Belcher, Michael 63	Cagle, Margaret 387	CPM Educational Program	Elliot, Lucas
Bell, Stacey 437	Caldwell, Janet 431	253.3	
Beller, Laura 251	Cameron, Antonia 304, 347, 514	Cramer, Kathleen 19, 213	Elliott, Kirsten
Bellman, Allan 344	Campe, Karen	Crawford-Ferre, Heather 390	Ellis, Mark 201
Bennett, Amy 653	Campos, Ed 172	Cresci, Cheryl 483	Ellis-Guardiola, Ines 143
Bennett, Cory 175	CanFigureIt501.4	Crystal, Crystal 585	eMath Instruction, Inc 556.2
-		, Juni, , Juni	

Emdin, Christopher	Gano, Liz 164	Harris, Shawn 528	Jensen, Susan 210
Endo-Peery, Lacy 281	Gapero, Kaulu	Harriss, Edmund 126	Jilly, Michelle 55
	1 ,		
Ensley, Doug	Garber, Melissa 408	Hartley, Jake 51	Jmourko, Galina (Halla) 353
Erickson, Timothy 455	Garcia, Marta 289	Hartweg, Kim 94	Johnson, Heather 97
Ernst, Kathy 163	Gardenhire, Erin 21	Hassan, Stefanie 489	Johnson, Kenneth 175
Eskelson, Samuel 186	Gardiner, Angela 241, 637	Hasselbring, Cindy 345	Johnson, Nanette 299
Estrella, Sadie 40	Gargroetzi, Emma 586	Haunsperger, Deanna 313	Johnson, Raymond 1906
Evans, Becky 451	Garneau, Marc 260	Hayes, Donovan 371	Johnston, Will 522
, ,			
Everhart, Barbara 57	Garner, Jamie 293	Hayes, Heidi 520	Jones, Dusty 127
Ewing, David 587	Gartland, Karen 619	Head, Lindsay 314	Jones, James 612
ExploreLearning 446.3	Gay, Susan	Healey, Kelly	Jones, Karen 517
Explore Ecanning			
E	Gennuso, Penny 417	Hearn, Meg 41	Jones, Tammy 222
F	Gerver, Julianne 193	Heiberger, Sara 446	Jorgensen, Marcus 138
Fancsali, Cheri 320	Gerver, Robert 71, 193, 311	Heid, M. Kathleen	<u> </u>
Farmer, Bethany 296			K
*	Gibson, Taylor 166	Heins, Elizabeth 385	
Farrar, Scott 646	Girolamo, Lynn58	Helft, Shira 629	Kalman, Richelle 99
Faulkner, Valerie 600	Gittermann, Megan 232	Henson, David 285	Kanold, Timothy 338, 557
Felling, John 511			Kaplan, Orhan 180
	Glancy, Aran 246.1	Herlehy, Lindsey 305	
Fennell, Francis (Skip) 445	Glanfield, Florence 122	Herman, Amy 159	Kaplinsky, Robert 66
Fenton, Michael 340, 539	Glasier, Victoria 406	Hernandez, Maria 166	Kaplon-Schilis, Aleksandra 663
Ferguson, Allison 273			Karbon, Kristen 269
	Glenn, Michele 476	Herner-Patnode, Leah 108, 414	
Ferguson, Brent 513, 543	Goerig, Brittany 64	Herod, Donicka 441	Karp, Karen 179, 336
Ferneyhough, Fred 153	Goetz, Al 215		Katt, Susie
		Herzog, Ivo 414	Kazemi, Elham 480
Ferris, Mary	Goffney, Imani 333	Hilty, Kristin 268	
Ferry, Deborah 18	Gogolen, Claire 460	Hinnenkamp, Todd 253	Kelemanik, Grace 174
Fetter, Annie 247	Gojak, Linda 22	Hinton, Ashley 34	Kelley, Paul 162, 544, 557, 592
Filler, Barbara 160	3		Kennedy, David 342
	Gold, Lindsay 343	Hinton, Forrest 563	
Fillingim, Jennifer 505	Goldberg, Adam 459, 552	Hintz, Allison 357, 480, 598	Kepler, Trish 131
Finney-Lewis, Minette 175	Goldsby, Dianne 611	Hodges, Thomas 314	Kepner, Henry
Firmender, Janine 238, 627		•	Kerins, Bowen 152
	Goldstein, Mark 112	Hohenwarter, Markus 564	
Fisher, Alex	Gomez, Carlos Nicolas 81	Hollebrands, Karen 30	Khalsa, Arjan 9
Fisher, Alice 470	Gonzales, Kim 248	Holloway, Damarrio 69, 317, 544	Kilday, Regina 515
Fishman, Daniel 513			Killion, Kurt 623
	Goodner, Pam 130	Holloway, Susan 577	
Fletcher, Edward 17, 178, 493	Gorsuch, Rachael 381	Honner, Patrick 189	Kim, Ann 182
Fletcher, Nicole 404	Gosek, Amanda 501	Horgan, Connie 12, 159	Kim, Hee-Joon 362
Florez, Graciela 638			Kim, Matt 129
	Gottlieb, Dewey 469	Hosket, Kayton 344	
Flynn, Michael 74	Gough, Jill 227, 266	Houghton Mifflin Harcourt 6.3,	Kinach, Barbara 378
Foletta, GIna	Goza, Nate 478	253.4, 285.4, 338.5, 394.3	King, Christine 100
Foran, Ali 611			King, Leah 51
	Grade, First	Houlahan, Ryan 103	
Ford, Beverly 625, 638	Graham, Karen 626	Houston, Michael 343	Klein, Raymond 339
Forest, Annie	Graves, Julie 512	Howard, Lorraine 325	Knighten, Latrenda 209
Fortenbaugh, Shirley 352			Kobett, Beth 445, 621
	Gray, Kristin 357, 616	HP, Inc 200.2, 501.2	
Fosnot, Catherine 433	Green, Beth 105	Hrdina, Victoria 237	Koehler, Mike 53
Fouss, Kristen 495	Green, Brenda 98	Hruby, Jeff 202, 472	Koehn Hurtado, Carolee 201
Fox, Ryan 27	· ·		Koestler, Courtney 167
	Griffin, Melinda 490	Hudson, Karen 160	
Fox, Thomas 101	Groome, Meghan 320	Hudson, Timothy 337	Koetsier, Britney 163
Franklin, Christine 246, 420	Gross, Michelle 434	Huebner, Amy 278	Kott, Brooke 30
Frazier, Tasha 617	Guarino, Jody 197, 550, 560	Hufstedler, Elizabeth 531	Kreisberg, Hilary 200, 484
Freemyer, James 15			Kreizel, Julie 207
	Gurl, Theresa 27	Hughes, Elizabeth 11, 426	Kicizci, Julic
Fricchione, Cheryl 105	Gutierrez, Melanie 415	Huinker, DeAnn 6, 135	Kriegler, Shelley 376
Friedman, Megan 210	Gutiérrez, Rochelle 333	Hunt, Renee 148	Krupa, Adam 528
Friesen, Tiffany 648			Kuehl, Barbara 165
, ,	Gutierrez, Rodrigo 353, 428	Hunter, Diane 501	
Froschl, Merle 320		Hunter, Shelley Rea 464	Kung, Andrea 524
Fujiwara, Yujiro 316, 639	H	Hurst, Rebecca 346	Kutach, Kelly 525
Fulmore, Linda 136	Haciomeroglu, Erhan 424		Kwako, Joan 185
		Hyde, Karajean 202, 472	Tewaro, Joan 105
Funderburk, Joanie 96	Haines, Cara 375	Hyers, Karen 205	L
Funk, Martin 416.1	Haistings, Jeanine 253	- ·	
Furuto, Michael 654	Hajek, Andrea 80	I	Lacefield, William 265
		•	LaLonde, Nikki 530
Fuson, Karen 245	Hakansson, Susie 89	Isaacs, Andy 466	
C	Hall, Becky 395	Iverson, Tonjuna 37	Lambert, Kathy 301, 591
G	Ham, James 328	•	Lambert, Rachel 546
Gael, Andrew 546		J	Lancaster, Ron 61, 192
Gagnon, Eileen 657	Hansen, Nicole 200	Jackson, Christa 170, 575	Landy, David
	Hansen, Pia 309		Landy, David
Galindo, Enrique 369	Harbin Miles, Ruth 363	Jacobs, Judith 62	Langrall, Cynthia 26
Gallas, Lindsey 582	Harbour, Kristin 474	Janes, Robert	Larkin, Kevin 78
Gann, Cheryl338.1	11410041, 1X115HH		
		Janzen Melanie 60	Larson Christine 157
	Hardin, Sheila 235	Janzen, Melanie	Larson, Christine 457
Gannon, Erin		Janzen, Melanie	Larson, Christine

Larson, Mike 620	Martin, W. Gary 271	Morris, Peter 492	Pearson, Melissa 479
Laskasky, Katie 384, 661	Martinez, James 389	Moss, Erin 584	Peck, Frederick 214
Laughlin, Connie 394	Martinez-Cruz, Armando 458	Motsco, Shannon 199	Peck, Roxy 137
9 1	Marynowski, Richelle 503		Pelesko, John 217
Law-Balding, Katie 577		Muehler, Paula 366	
Lawrence, Gary 645	Mason, Margie 649	Munson, Jen 188	Peneda, Maria 226, 570
Lawrence, Kimberly 624	Masters Goffney, Imani 599	Murawska, Jaclyn 356, 589	Pennington, Christina 144
Lawrence, Thalia 654	Masunaga, David 250	Muren, Rachel 291, 508	Perry, Jill 622
Leake, Antoinese 617	Math Learning Center, The285.1	Murray, Alissa 184	Peters, Susan 434, 549
Leath, Joy	Math Teachers Press, Inc 338.3	,,	Peterson, Ingrid
Lee, Hea-Jin 108, 414		N	Pettis, Christy 246.1
	Mathspace 91.4, 394.4	Nabb, Keith 589	
Lee, Hollylynne 77	Matthews, James 287		Peyser, Elizabeth 156
Lee, Jean	Matthews, Lou 393	Nalu, Nicolette 203, 306	Philipp, Randolph 312
Lee, Solana 259	McDaniel, Miko 417	Nance, Becky 504	Phillips, Breanne 506
Lee, Yujin 611	McAleer, Jennifer 492	Napp-Avelli, Carolina 428	Picciotto, Henri 303, 473
Leimberer, Jennifer	McCallum, William 31	Nataro, S. Leigh 655	Pickford, Avery
		National Geographic/Cengage	
151, 294, 462, 581	McClain, Nataki 34		Pickford-Murray, Breedeen 295
LeMoine, Eric 494	McClish, Marissa 509	Learning	Piechura-Couture, Kathy 385
Lemons-Smith, Shonda 652	McCormick, Casey 444	Nebesniak, Amy 409	Pinthong, Uraiwan 607
Lempp, Jennifer 270	McCormick, Jennifer 334	Newell, Christine 630	Porch, Denise 485
Lesser, Lawrence 67	McCrum, Ellen 526	Nguyen, Ha 236	Potter, Laura 308
		Nichols, Sue 161	Powell, Sarah
Lewis, Brook 124, 648	McCue, Camille 52	Nickerson, Rob 310	,
Lewis, Courtney 642	McCune, Jaci 509	,	Power, Jason 355
Lewis, Glen	McDaniel, Mandy 449	Nieman, Hannah 187	Power, Stephanie 398, 533
Lewis, Jennifer 477	McDonald, Dennis 211	Niemiera, Sandra 294, 462, 581	Powers, Robert 542
Lewis, Rebecca	McDowell, Denise 208, 269	Nirode, Wayne 371, 463	Pratt, Jason 81
		Noh, Jane 182	Price, Lori 418
Lewis, Virginia 350	McGarvey, Lynn 398, 533	Nolan, Edward 16, 123, 424	
Libberton, Jason 322	McGatha, Maggie 72		Proffitt, Tracy 453
Lillis, Donna 234	McGill, Jessica 591	Nonis, Michelle 656	Prokop, Marianne 206
Lima, Luis 551	McGowan, Kristy 436, 566	Norland, Ruby 296	Provencher, Maeghan 174
Lincoln-Moore, Christina 573	McGowan, William 63	North Morris, Jennifer 284	Pruitt, Liz 13
Lindgren, Nichole 59	McGraw-Hill Education	Novakowski, Janice 644	11414, 212
		Nunnally, Heather 191	R
Lindner, Nicki 183	34.3, 338.4		
Lindsey, Shelly 548	McMillen, Susan 407	Nur, Laila	Raff, Cynthia
Link, Joshua 279	McNamara, Julie 596	Nutakki, Nirmala 301	Rainbow-Harel, Melanie 659
Little Crow, Michael 607	McPherson, Karen 256		Ramakis, Anthony 529
Livers, Stefanie 474	McQueen, Amy 21, 603	O	Ramirez, Nora
		O'Bryan, Alan	Ramsey, Lori 42
Lochel, Bob 539	McShane, Renee 119, 304	O'Callaghan, Robin 225	Rathlev, Mary 199
Looney, Susan	McShea, Betsy 103	O'Connell, Susan 497	
Lord, Sarah 553	Meadows, Michelle 535	O'Dell, Jenna	Ratliff, Brea 585
Lott, Johnny 561	Medina-DeVilliers, Catherine 397	O 1 Gt 1	Rawson, Pamela 430
Lounsbury, Karen 46	Mello, Alison 168	Ogden, Stephanie 318	Rayburn, Pamela 93
Lovrics, Christine 436, 566	Menard, Wendy 586	Oliver, Carl 169	Ray-Riek, Max 194, 461, 592
		Orgera, Carrie 119, 526	Reardon, Tom
Lu, Soo Jin	Mendoza, Adrianne 662	ORIGO Education	Reed, Jenn
Luberoff, Eli 85	Merrill, Maria 298	6.2, 34.2, 91.3	
Lubow, Jillian 229	Meyer, Dan 264		Reese, Caitlin 230
Lucenta, Amy 174	Meyer, Julien 279	Ormandy, Tamara 422	Reese, George 651
Lund, Stephanie 50	Michael, Rachel 304	Orr, Jennifer 529	Reiners, Mike 593
		Ortega, Courtney 647	Reitemeyer, Michael 329
Lynch, Jayne 657	Mikes, Michelle 44, 224	Osterbuhr, Toni 156	Renaissance Learning 146.3
Lynch, Jeremy	Miles, Victoria 140, 335	Osters, Jonathan 510	Reynolds, Diane 42
Lynch, Sararose	Millar, John 543	Otten, Samuel 375, 388	Reynolds, Diane 42
	Miller, J. Lyn 92		Rhodes, Sam 649
M	Miller, Zack 392	Ozgun-Koca, S. Asli 594	Riccomini, Paul 426
Maa, Wendy 651	Mills, Greta	D	Riddell, Claire
Mabbott, Arthur 90		P	Ridpath, Brian
	Milou, Eric 547	Paoletti, Teo 402	
Madura, Katherine 520	Mirzaian, Tatiana 384, 661	Pardun, Jim 482	Rieger, Lysa
Magnus, Teresa 442	Mitchell, Mary 292	Parrish, Sherry 610	Riggins, Julie 239
Malpani, Sonal 514	Mittag, Kathleen 109, 413	Pasiuk, Karen 520	Rimbey, Kimberly 604
Mangahigh.com 6.4, 446.4	Mojica, Gemma	,	Rinehart, B. Michelle 588
Manganello, Michael 425	Monohan Coine 400	Patterson, Nikita 282	Riske, Amanda 288
Marano, McKendry 39	Monahan, Ceire 402	Pauley, Gayle 324	Rivers, Karen 614
	Monck Wollman, Donna 300	Payne, Regina 240	
Marley-Payne, Jack 54	Monroe, Eula 321, 641	Peabody, David 288	Roberts, Christine 341
Marshall, Anne 504	Monson, Debra 19, 213	Pearce, Kyle	Robinson, Britt 116
Marti, Andres 56	Montgomery, Barbara 255	Pearl, Dennis 67	Robinson, Joseph 438
Martin, Danny Bernard 379	Moore, Danielle	,	Rodgers, Judy 352
Martin, Dave 70		Pearson, Keri 409	Rodriguez, Anthony 475
Martin, Jay 422	Moore-Luchin, Beatrice 365	Pearson Learning Services	Roscoe, Matt
	Morano, Stephanie 426	6.1, 91.2, 285.3, 501.3	
Martin, Mary 222	Morgan, Michelle 542		Rose, Suzanne 613

Rose, William 146	Singh, Sunil 142	Timmerman, Maria 350	Wells, Carroll 538
Rosen, Linda 91	Sinha, Dev 23	Togliatti, Karen 305	Wells-Corfield, Whitney 624
Rosen, Shelley 141	Sisemore, Cassie 506	Toncheff, Mona 257, 465	Weltman, Anna 219
Roth McDuffie, Amy 641	Slabic, Stephanie 119, 347	Totaro, Susan 479	Werner, Judy 613
Roy, George 314	Smith, Krystal 591	Trantham, Amber 203	West, Lucy 423, 557
Rubillo, James 177	Smith, Margaret (Peg) 6, 134	Trinkle, Mary 188	Whipple, Betsy 164
· · · · · · · · · · · · · · · · · · ·			
Rubinstein, Gary 300	Smith, Nancy 297	Trotter, Shawn	Whipple, Kyle
Rubinstein, Jill 386	Smith-Moyler, Tamara 251	Troutman, Susan 361	White, Carolyn 361
Ruda, Christine 456	Soares, Tracie 660	Turner, Cassandra 576, 615	White, Dorothy 4, 574
Rumsey, Chepina 197, 550	Somerall, Sally 631	Turner, Kaneka 289	White, Jade
	, ,		
Rushing, Frederic 81	Sorensen, Kaye 409	Tyson, Douglas 280	White, Sandra 198
Russell, Julie 608	Sotillo, Mercedes 568		Whitmer, Christopher 170
Ryan, Jim 571	Soto, Roberto 458	U	Wieman, Robert 622
reguii, oiiii		Ulbright, John 204	
S	Southworth, Amy 273	Umland, Kristin	Wilcox, Luke 221, 582
	Sovde, Doug 551		Wilhelm, Kyle 548
Sabnani, Heidi 107	Speiser, Lauren 416	Urbanowski, Vin 405	Willard, Teri 449
Saeta, Linda 79, 359	Srock, Marianne 18	Usiskin, Zalman 91, 635	Wilson, Jennifer 227, 266, 432
Safi, Farshid 150, 349, 527			
Sala Garcia, Jose Francisco 545	Stadel, Andrew 491	V	Wiltjer, Mary
	Stairs, Jennifer 298	Vahey, Philip 567	Winer, Lisa
Sander, Grant 276	Staley, John 69, 317, 605		Winston, Paul 102
Sandha, Jaspreet 129	Starnes, Daren 244, 500	Valencia Mazzanti, Ciristina 132	Winters, Jeremy 481
Sands, Yojairy 226, 570		Van Buren, Jenny 315	
	Statmore, Elizabeth 286	Van Der Werf, Sara 374	Wise, Robyn 556
SanGiovanni, John 602	Steele, Mike 444	Van Ingen, Sarah 186	Wohlhuter, Kay 468
Sarno, Rebecca 606	Steketee, Scott 371	C ,	Wolf-Diaz, Alexis 382
Scearce, Laura 624	Stephens, Ana 637	Van Zante, Jennifer 530	Won, Noelle 653
Schackow, Joy 578		Vancil, Steve 21, 603	
	Stevens, Elizabeth	VanderBee, Kathy 255	Wood, Jerra 419
Schaefer, Lucia 83	Stevens, Harriette 362	Varlotta, AnnMarie 133, 232	Woods, Christine 531
Schanzer, Emmanuel 43	Stevens, Joanna		Worek, Frances 14
Scher, Daniel	Stevens, John 559	Vatchkova, Alexandra 498	Worley, Christina 13
Schettino, Carmel 541	,	Velasco, Richard 316, 639	
Schmidt, Anne 207	Stiff, Lee 8, 91	Venegas, Salvador95	Wray, Jonathan 377, 445
	Stohlmann, Micah 319	Venenciano, Linda 147, 454	Wyberg, Terry 19
School, Southwest DeKalb 155	Strayton, Marianne 435		Wynne, Elizabeth 39
Schrock, Connie 158	Strickland, Carla 466	Vestal, Sharon 457	
Schuhl, Sarah 257, 465		Vishnubhotla, Madhavi 402	Y
	Strom, April 231	Vittorio, Catherine 60	Yaccarino, Ann 606
Schulcz, Benjamin 495	Sturgill, Derek 452	Vogel, Judith 103	
Schulman Dacey, Linda 554	Stylianou, Despina 241		Yagi, Seanyelle 147
Schuppan, Frederick 225	Su, Francis 246, 592, 664	Vokey, Molly	Yates, Sheila 12
Schwartz, Rachel 216	Suh, Jennifer 471	von Pallandt, Allen 658	Yeh, Cathery 201
Scott, Jan			Yeo, Sheunghyun 388, 597
	Sullivan, Patrick 623	\mathbf{W}	
Sebelski, Steve 551	Sutorius, Janet 534	Wagner, Robert 45, 180	Yoon, Hyunchul 597
Seeley, Cathy Lynn 327	Sutton, Kim 521, 363	Walker, Becky 96, 208, 446	Young, Terrell 641
Seitz, Richard 24	Suzuka, Kara		Youngblood, Amy 502
Sela, Hagit 45		Walker, Erica 640	Yudovina, Tatiana 427
	Swan, Patti 412	Walkowiak, Temple 501	
Sell, Peter 102	Swinkels, Amy 398, 533	Wallace, Sarah 608	Yuen-Shore, Cameron 392
Sellers, Patsy	Sylves, Erin 59	Wallach, Kenya	
Seylar, Amy 590	2,2,70, =====		Z
Sgroi, Richard 71, 311	T	Waller, Patrice 99	Zager, Tracy 330
		Walsh, Thomas 272	Zaragoza, Diana 154
Shah, Meetal 63	Tabor, Josh 500	Walth, Mark 334	Zarandona, Lauren 106
Shareshian, Lauren 338.1	Talada, Jessica 399	Waltrup, Angela 590	
Sharlow, Lynette 523	Talbert, Rachael 650		Zbiek, Rose Mary 111, 252
Shaughnessy, J. Michael 448	Tang, Greg 277, 557	Wares, Arsalan 290	Zenigami, Fay 147, 454
		Washington Jr., Harry 634	Zhao, Wenmin
Shay, Brian	Tanton, James 76, 628	Wasserman, Nicholas 125	Zimba, Jason 555
Sheets, Katie 98, 659	Tarlow-Hellman, Lynn 28	Watanabe, Tadanobu (Tad) 537	
Sheffield, Linda 149.1, 572	Taylor, Cynthia 575		Zimolzak, Amanda 291
Shepherd, Chad	Taylor, Sharon 109	Watkins, Jonathan 549	Ziter, Rachel 52
•		Watson-Ivy, Kelly 599	Zych, Ariel 499
Sherman, Christina 275	Teague, Daniel 420, 569, 626	Webb, David 1906	2 y em, 1 m er
Sherman, Diana	TEALS/Microsoft Philanthropies	Webber, Barbara 663.1	
Shilling, Leah 350			
Shing Lee Publishers	Texas Instruments 146.2,	Webel, Corey 597	
		Weber, John	
34.1, 91.1, 200.1, 253.2, 285.2,	200.3, 338.2, 394.1, 578.1	Weber-Salgo, Amy 509	
446.1, 501.1	Tewes, Ashley 620	Wegener, Kelly 275	
Shore, Chris 307	Thames-Schwantes, Chellie 346		
Siddappa, Sara 143	Thomas, Christine 467	Weiland, Lindsey 183	
	Thompson, Deborah 523	Weimar, Stephen 307.1	
Silbey, Robyn 373		Weisberg, Gabriella 524	
Sinclair, Nathalie 25	Tichenor, Mercedes 385	Weiss, Yannabah 469	
Singapore Math, Inc.	Tienda, Monica 493		
446.2, 578.2	Tilford, Amy 306	Weitnauer, Erik 565	
10.4, 370.4			



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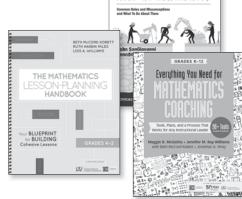
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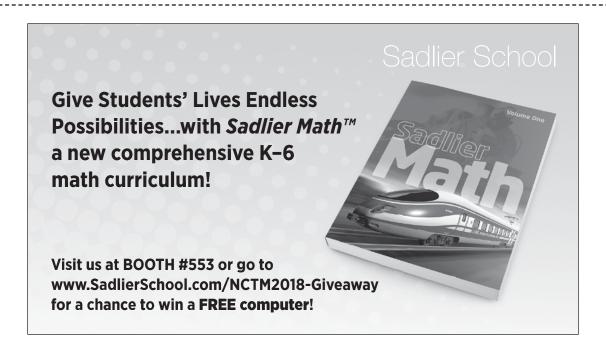
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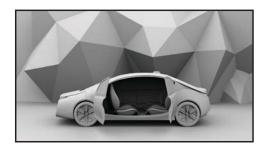
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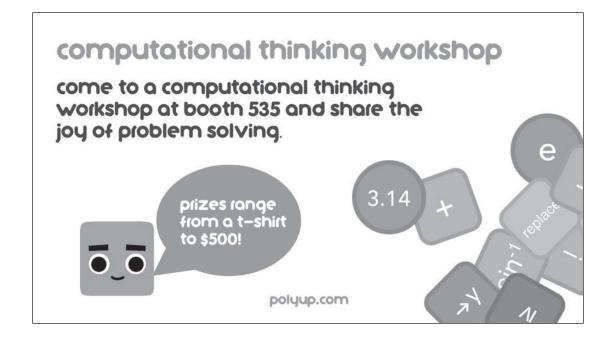
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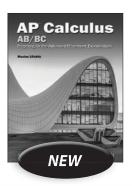


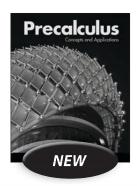
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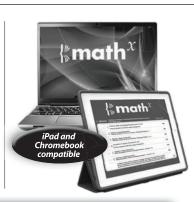


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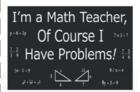
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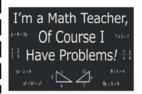
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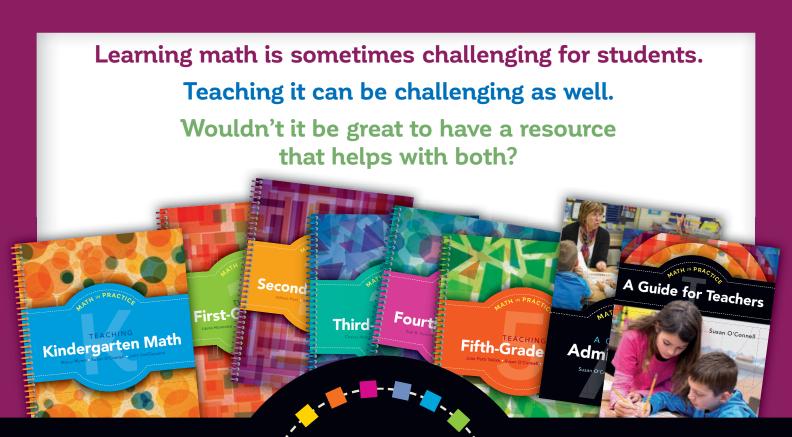
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