2015 NCTM ANNUAL MEETING & EXPOSITION
April 15–18 • Boston

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Program Book

See Valuable COUPONS beginning page 217

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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 www.nctm.org

Printed in U.S.A.
Welcome to the NCTM 2015 Annual Meeting & Exposition—the world’s largest annual meeting for mathematics education, bringing together classroom teachers, mathematics educators, mathematicians, and researchers. You have many opportunities here to learn new ideas and approaches so you can help provide more and better mathematics for all students. We hope you will meet colleagues, both new and familiar, share ideas and learn new information. The sessions, workshops, bursts, and networking opportunities in the conference will reignite your energy and send you back home eager and energized to continue your work. Our goal is for you to have the best professional development experience possible and for you to leave here with many new ideas to share with all your colleagues.

If you are attending your first NCTM annual meeting, be ready for a professional experience unlike any other. Be sure to attend one of the Annual Meeting Overview & Orientation sessions to get you familiarized with all that’s available. For those of you who are veterans of NCTM conferences, you know that you will have much to do.

The Program Committee has been working for two years to make this a fantastic program with presentations covering a wide range of areas. There are special sessions about supporting both students and teachers as learners as well as presentations addressing social justice, integrating math with other disciplines, assessing the Common Core, effective teaching practices, and more! Additionally, the Benjamin Banneker Association, TODOS: Mathematics for ALL, and Women in Mathematics Education have created an Equity strand of presentations. Lastly, those in their first few years of teaching will want to check out the special New Teacher strand with sessions designed to really support those who are beginning their careers.

When the conference day is over, join your colleagues and experience Boston’s diverse neighborhoods, each of which has a remarkably different style and tone. The Convention Center is located in South Boston’s Seaport District, an area teeming with wonderful restaurants and shops. Also be sure to visit Back Bay, home to wonderful Victorian townhouses, cobblestone streets, and a multitude of chic high-end boutiques. History buffs will want to head to the Freedom Trail and Quincy Market to experience great colonial atmosphere, and don’t forget to enjoy some wonderful Italian food in Boston’s North End. You might also want to venture across the Charles River and explore Cambridge’s wonderful collection of neighborhood squares or visit one of its many institutions of higher education, including Harvard and MIT.
The NCTM 2015 Annual Meeting & Exposition officially begins with the Opening Session, starting at 5:30 p.m. on Wednesday, April 15, in the Grand Ballroom of the Boston Convention and Exposition Center (BCEC). Presentations on Thursday, Friday, and Saturday begin at 8:00 a.m. each day and are scheduled concurrently throughout the day at both the BCEC and the Westin Boston Waterfront Hotel, which is connected to the convention center via a skybridge.

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, silence your cell phone during all presentations.

New Teacher Strand NT

THURSDAY, APRIL 16 & FRIDAY, APRIL 17

The New Teacher strand offers sessions and gallery workshops targeting the questions and concerns of new teachers and those training to become teachers. Presentations are grade-band specific and include topics from management and motivation, to engaging struggling students, to a celebration of those entering and just beginning their teaching careers. Learn, network with other new teachers, and get your questions answered. The strand targets early-career teachers and those working on certification; all are welcome.

Look for the symbol NT for presentations within the strand. Start early with the New Teacher Workshop & Kickoff (presentation #60) on Thursday at 8:00 a.m. and finish with the New Teacher Celebration (presentation #605) on Friday at 4:45 p.m. for more fun. Visit www.nctm.org/newteacher for more information

Assessing the Common Core CC

The Assessing the Common Core strand offers sessions, bursts, and gallery workshops designed for teachers, teacher leaders, and math specialists/coaches, to focus on effective and efficient assessment practices. This includes a focus on both formative and summative assessment. In these sessions, participants will engage in discussions and reflect on activities that address the role of both formative and summative assessments, consider the resulting data that uncovers student thinking and reasoning, and learn how to identify unfinished learning and strategically move student learning forward.

Problems Worth Solving PS

The Problems Worth Solving strand focuses on finding, adapting and/or designing, and implementing worthwhile mathematical tasks. The primary goal for the strand is to develop a deeper understanding about what makes a task worthwhile, and consider the influence of these tasks on developing mathematical habits of mind, such as those articulated in the Common Core State Standards for Mathematical Practice. Throughout the strand, participants should consider the following questions:

1. What makes a problem “worth solving”? What are the potential influences of worthwhile tasks on student thinking and reasoning?
2. What mathematical teaching practices (e.g., those in NCTM’s Principles to Actions) support implementation of worthwhile tasks? What are specific actions and decisions a teacher would make?
3. How might a teacher elicit students’ mathematical thinking and orient students toward one another and the discipline? What are the benefits and drawbacks of various approaches?

Supporting Teachers as Learners TL

The Supporting Teachers as Learners strand focuses on enhancing teachers’ mathematical and pedagogical content knowledge in support of the wide range of learners in today’s classrooms. Session topics span K–grade 12 and include supporting the development of effective teaching, reasoning abstractly and quantitatively, formative assessment pathways, and the art of teaching math.

Supporting Students as Learners SL

The Supporting Students as Learners strand is at the heart of what teaching mathematics is all about. This strand presents best ideas, strategies, practices, and curricula, etc., that can be used to support students as learners of mathematics. Participants will go forward from the strand’s sessions with a renewed sense of possibilities for empowering all students to actively engage in and ultimately learn mathematics.

Integrating Math with Other Disciplines IM

The Integrating Mathematics with Other Disciplines strand focuses on the importance of mathematics beyond the classroom. The goal of this strand is to feature the relevance of mathematics for students through the connections in visual, performing, and literal arts, the social sciences, as well as STEM-related topics. Sessions may also address the integration of mathematics and Next Generation Science Standards.
**Equity Strand**

Through sessions that span a variety of grade-band audiences, the Equity strand is designed to support educators as they address the needs of ALL students and ensure that they have access to a high-quality mathematics program. This strand features presentations given by the Benjamin Banneker Association, TODOS: Mathematics for ALL, and Women and Mathematics Education. Presentations are scheduled on Friday and Saturday.

**NCTM Committee Strand**

NCTM committee presentations are identified by the symbol above. Presentations are scheduled throughout the conference. For a list of all NCTM committees, please visit [www.nctm.org/](http://www.nctm.org/).

**Mathematical Association Presidents’ Series**

The Presidents’ Series is a feature of the NCTM Annual Meeting program that highlights connections within the mathematical community at different levels. Presentations are scheduled throughout the conference.

**Annual Meeting Overview & Orientation**

New to NCTM, or a first-time attendee? Hear about maximizing your NCTM member experience, get takeaways full of classroom-ready activities, and more at the Annual Meeting Overview & Orientation. Plus, the sessions will discuss the conference’s format and help you make the most of your experience. Our attendees represent the United States, Canada, and many international locations.

**Wednesday**

Presentation #1  
4:00 p.m.–4:30 p.m.  
Ballroom 210 (Convention Center)

**Thursday**

Presentation #3  
7:15 a.m.–7:45 a.m.  
Grand Ballroom A (Westin)

Don’t miss the **Opening Session** on Wednesday evening with featured speaker Elizabeth Green, author of the New York Times bestselling book *Building a Better Teacher: How Teaching Works (and How to Teach It to Everyone)*

**Types of Presentations**

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

- **Sessions** (60 minutes) represent a common format in which the speaker relates his or her ideas to an audience. The speaker may use audiovisual equipment, technology, and handouts, and sessions may include audience participation.

- **Research Sessions** (60 minutes) emphasize the connection between research and practice, presented in a common format in which the speaker relates his or her ideas to an audience. The speaker may use audiovisual equipment, technology, and handouts, and sessions may include audience participation.

- **Gallery Workshops** (75 minutes) have rooms set with round tables for hands-on work and additional gallery seating around the perimeter of the room. Gallery participants receive the print materials and observe the workshop in a fashion similar to that of a classroom observer.

- **Bursts** (30 minutes) are concise presentations that focus on a specific topic or idea. The goal is information sharing, conveyed quickly and succinctly. Bursts are not appropriate for hands-on activities, group work, or lengthy topics.

- **Exhibitor Workshops** (60 minutes) are set theatre style for at least 120 people. Exhibitors showcase their products and services away from the Exhibit Hall. Look for the symbol indicating exhibitor workshops in the program book.

**Grade Bands**

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

- Pre-K–2
- Grades 3–5
- Grades 6–8
- Grades 9–12
- Higher Education—university- and college-level issues (including both two-year and four-year institutions)
- Preservice and In-Service—content and techniques for providers of preservice teacher education and professional development for practicing teachers, supervisors, specialists, coaches, and mathematics educators
- General Interest—applicable to all grades and audiences

**On-Site Daily News**

Start each morning with the NCTM Daily News, which will include late-breaking news about the NCTM 2015 Annual Meeting & Exposition, as well as program changes and cancellations. The Daily News will be distributed in the lobby areas of the Boston Convention and Exhibition Center and the Westin Boston Waterfront hotel.
Visit NCTM Central in Boston—
Get What You Need from Your NCTM Membership

Check out NCTM Central at the exhibit hall entryway. Explore all the NCTM resources you need to meet your mathematics teaching challenges—all in one place:

**Bookstore**
- Examine the newest books and get **25% off all book and product purchases**

**Member Services**
- Pick up **free journal samples**
- Join NCTM or renew your membership and get a **free conference T-shirt**

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

**Networking Lounge**
- Learn about **writing and reviewing articles** for the journals
- Join **free, informal 30-minute discussions** with highlighted and strand speakers on hot topics
- Catch up on **e-mail and social media** updates
- Download the **Conference App** for alerts

**Mathematics Education Trust**
- Learn about **grants, scholarships, and awards** for mathematics teachers, educators, and prospective teachers
Check out our sessions at NCTM!

Empower Teachers, Engage Students, Make Math Fun: Intervention That Does It All
Friday, April 17th at 12:30PM, Room 152
Come learn how to empower teachers through a friendly, engaging and fun intervention model that provides effective strategies for rich instruction, blending both conceptual and procedural learning.

To Infinity and Beyond! Boost Your ELL Learners’ Academic Vocabulary
Friday, April 17th at 2:00PM, Room 152
In this session, we will share strategies, activities, games, and professional resources that will boost and empower your learners to speak the language of mathematics!

Read It, Write It, Solve It: Improving Content-Area Literacy and Problem Solving
Friday, April 17th at 3:30PM, Room 152
Help students communicate their mathematical thinking and understanding with content-rich reading, writing, and problem-solving experiences.

www.tcmpub.com • (800) 858-7339
**Highlights**
Annual Meeting Overview & Orientation (Presentation 1)
Opening Session: Building a Better Teacher: How Teaching Works (and How to Teach It to Everyone) (Presentation 2)

**Conference App**
Network onsite with attendees!
www.nctm.org/confapp

**Facebook**
Check out the problem of the day!
www.nctm.org/facebook

**Twitter**
Want to stay informed? Follow us!
www.twitter.com/nctm
#NCTMBoston

**Registration Hours**
8:00 a.m.–7:00 p.m.

**Bookstore & Member Services 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.
Regional Caucuses for Delegates and Alternates

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 4 on page 10 for the Delegate Assembly information. The Regional Caucuses information is below.

2:30 p.m.–4:30 p.m.
(Excluding the Western Caucus)
Boston Convention & Exhibition Center
Room: 258 B/C

7:30 p.m.–9:00 p.m.
(Western Caucus)
Boston Convention & Exhibition Center
Room: 259A

CAUCUS | PRESIDENTS
--- | ---
Affiliates-at-Large | Florence Glanfield, University of Alberta, Edmonton, Canada
Canadian | Marj Farris, North Peace Tribal Council, La Crete, Alberta
Central | Janet Herrelko, University of Dayton, Ohio
 | David Ebert, Oregon High School, Wisconsin
Eastern | Shawn Towle, Falmouth Middle School, Maine
 | Janie Zimmer, Research-Based Education, Reading, Pennsylvania
Southern | Betty B. Long, Appalachian State University, Boone, North Carolina
 | E. Jean Ware, (Retired), Shreveport, Louisiana
Western | Denise Trakas, Washoe County School District, Reno, Nevada
 | Jill Sumerlin, (Retired), Tillamook, Oregon

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Problem Solving for the Common Core

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- Preliminary Planning Sheets serve as the teacher’s guide to each task, outlining the math concepts and skills that students will need to know to solve the problem
- Differentiated tasks for instruction, exploration, and formative assessment
- Corresponding summative assessments (include anchor papers and scoring rationales)
- Rubrics for teachers and students

From Texas? Ask about our NEW problem-solving material for the TEKS!
4:00 P.M.–4:30 P.M.

1
Annual Meeting Overview & Orientation
General Interest Session

New to NCTM? Join members of the NCTM Board of Directors to learn how to maximize your membership experience. From journals, online lessons, tools, and activities to networking and career-advancement opportunities, discover all that NCTM has to offer you. First-time attendees, learn how to make the most of your time at the conference.

Board of Directors, National Council of Teachers of Mathematics
National Council of Teachers of Mathematics, Reston, Virginia

5:30 P.M.–7:00 P.M.

2
Building a Better Teacher: How Teaching Works (and How to Teach It to Everyone)
General Interest Session

Everyone agrees that a great teacher can have an enormous impact. Yet we still don’t know what, precisely, makes a teacher great. Is it a matter of natural-born charisma? Or does great teaching require something more? In this talk, Elizabeth Green introduces a new generation of educators who are revealing the hidden science behind their art. A former principal studies the country’s best teachers and discovers a common set of techniques to help children pay attention. Two math teachers videotape a year of lessons and develop a new approach that has nine-year-olds writing sophisticated mathematical proofs. Through their stories—and the hilarious and heartbreaking theater that unfolds between children and teachers every day—Green examines the dynamics of truly effective teaching. Exploring the astonishingly diverse skills exceptional teachers must develop, she provides a new way for teachers, parents, and policymakers to judge what is needed in the classroom—and considers how to make every teacher great.

Elizabeth Green is co-founder, CEO, and editor-in-chief of Chalkbeat, a nonprofit news organization that covers educational change efforts across the country. She has written for the New York Times Magazine, the New York Sun, and U.S. News & World Report. She was an Abe Journalism Fellow studying education in Japan and a Spencer Fellow in education journalism at Columbia University. She serves on the board of the Education Writers Association.

The 2015 NCTM Lifetime Achievement Awards will be presented to M. Kathleen Heid, Franklin D. Demana, and, posthumously, Bert K. Waits at the Opening Session.

Elizabeth Green
Author; Cofounder, CEO, and editor-in-chief of Chalkbeat, New York, New York

New to Teaching? Get answers to pivotal questions and concerns of new and soon-to-be teachers at the New Teacher Strand on Thursday and Friday.
**Build Your Professional Resource Library with New Books from NCTM!**

**NEW | Mastering Basic Math Skills: Games for Third through Fifth Grade**
BY BONNIE ADAMA BRITT
Stock #14508
Keep your students engaged and reinforce math skills with this collection of games for grades 3–5. Your students will have fun, and you’ll see results! All games are aligned with the Common Core State Standards for Mathematics.

**NEW | Annual Perspectives in Mathematics Education 2015: Assessment to Enhance Teaching and Learning**
EDITED BY CHRISTINE SURTAAM
Stock #14860
Improve instruction for all grades by using research-based strategies outlined in the 2015 issue of APME.

**NEW | More Lessons Learned from Research, Volume 1**
EDITED BY EDWARD A. SILVER
Stock #14117
This book helps link classroom teachers to all that original research has to offer.

**NEW | Putting Essential Understanding of Ratios and Proportions into Practice in Grades 6–8**
BY TRAVIS OLSON, MELFRIED OLSON, AND HANNAH SLOVIN
Stock #14349
Learn how to address the big idea of invariance and its related essential understandings to develop students’ reasoning and skill with ratios and proportions.

**NEW | Putting Essential Understanding of Statistics into Practice in Grades 9–12**
BY TERRY CRITES AND ROY ST. LAURENT
Stock #14547
Explore research-based ideas and tasks for helping students develop their understanding of how to use statistics to investigate real-world problems.

Save 25%! Conference attendees receive a 25% discount off the NCTM list price on all purchases made in the Bookstore, including Special Products!*

**Visit the NCTM Bookstore to see these and other titles and products on display.**

**Bookstore Hours:**
- Wednesday 10:00 am – 7:00 pm
- Thursday 8:00 am – 5:00 pm
- Friday 8:00 am – 5:00 pm
- Saturday 8:00 am – Noon

Visit [www.nctm.org/store](http://www.nctm.org/store) for tables of content and sample pages.

For more information or to place an order, please call (800) 235-7566 or visit [www.nctm.org/store](http://www.nctm.org/store).

*This offer reflects an additional 5% savings off list price, in addition to your regular 20% member discount.
AN EQUATION THAT WORKS

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Builds fraction sense by engaging in mathematical discourse and sharing mathematical ideas.

Four Strikes & You’re Out
Supports numerical reasoning and mental computation.

101 & Out
Combines strategic thinking and column practice.

PLAY FOR A CHANCE TO WIN!
Winners Announced Every Hour!

VISIT BOOTH #300

Math Solutions Major Speakers
Stop by our booth for a schedule of presentations by our expert instructors!

Effective Classroom Teaching for Developing Numerical Understanding and Skills
Marilyn Burns
Thursday, April 16, 2015
12:30 PM–1:30 PM
Ballroom East (BCEC)

Mathematical Habits of Mind: Practices, Processes, and More
Cathy Seeley
Thursday, April 16, 2015
12:30 PM–1:30 PM
Ballroom West (BCEC)

Digging into Fraction Division
Julie McNamara
Saturday, April 18, 2015
8:00 AM–9:15 AM
109 A/B (BCEC)

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8:00 AM–9:15 AM
109 A/B (BCEC)
Highlights
Annual Meeting Overview & Orientation (Presentation 3)
Sixty-Sixth Annual Delegate Assembly (Presentation 4)
New Teacher Workshop & Kickoff (Presentation 60)
NCTM’s President’s Address (Presentation 230)

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Conference App
Network onsite with attendees!
www.nctm.org/confapp

Facebook
Check out the problem of the day!
www.nctm.org/facebook

Twitter
Want to stay informed? Follow us!
www.twitter.com/nctm #NCTMBoston

Registration Hours
7:00 a.m.—4:00 p.m.

Exhibit Hours
8:00 a.m.—5:00 p.m.

NCTM Central/Bookstore Hours
8:00 a.m.—5:00 p.m.

Fire Codes
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THURSDAY

7:15 A.M.–7:45 A.M.

3 Annual Meeting Overview & Orientation
General Interest Session
New to NCTM? Join members of the NCTM Board of Directors to learn how to maximize your membership experience. From journals, online lessons, tools, and activities to networking and career-advancement opportunities, discover all that NCTM has to offer you. First-time attendees, learn how to make the most of your time at the conference.

Board of Directors, National Council of Teachers of Mathematics
National Council of Teachers of Mathematics, Reston, Virginia

GRAND BALLROOM A (WESTIN)

7:30 A.M.–9:00 A.M.

4 Sixty-Sixth Annual Delegate Assembly
General Interest Session
This session is a forum for delegates - designated leaders of NCTM Affiliates to make recommendations to the NCTM Board of Directors concerning activities and policies of NCTM and mathematics education.

NCTM Affiliate Services Committee
National Council of Teachers of Mathematics, Reston, Virginia

GRAND BALLROOM B (WESTIN)

8:00 A.M.–9:00 A.M.

5 A Model Approach to Teaching and Solving Word Problems
3–5 Session
Visual models are the key to making word problems easier to solve at every grade level. We’ll explore a strategic progression from discrete, to part-whole, to tape diagrams, and then to double number lines that develops the algebraic skills needed for higher math. The goal isn’t to make math easy—it’s to give kids the tools they need when math gets hard!

Greg Tang
GregTangMath.com, Cambridge, Massachusetts

GRAND BALLROOM A (WESTIN)

6 Ask Don’t Tell: Powerful Questioning in the Mathematics Classroom
General Interest Session
What do powerful questions look like in mathematics? What does a classroom look like that engages in questioning and dialogue as a means of helping students develop deep conceptual understandings? In this session participants will engage in examples that illustrate how this highly effective teaching practice can be put to use in K–12 classrooms.

Angela B. Peery
The Leadership and Learning Center, Englewood, Colorado
Debra A. Moore
School District of Elmbrook, Brookfield, Wisconsin

210 B (BCEC)
8:00 A.M.—9:00 A.M.

7 Explore Boston Mathematically!
General Interest Session
Come take a mathematical walking tour of parts of Boston! During the walk we will generate and solve mathematical problems, learn some history and see some of the city’s sights! Must be able to walk four to five miles at a reasonable pace, climb stairs, and navigate uneven pavement. Facilitated by doctoral students Robbie Afonso, Christine Bodet, Laura Callis, Ziv Feldman, Cara Goldberg, Victor Mateas, Elyssa Miller, Andrew Richman, and Alejandra Salinas.
Suzanne H. Chapin
Boston University, Massachusetts
Alejandra Salinas
Boston University, Massachusetts

8 Formative Assessment Process: Layering Planning, Assessment, and Action
General Interest Session
Formative assessment is a hot topic, but its definition and understanding vary widely. What is a comprehensive process for planning formative assessment? What are the applications of the process? This session will consider how a comprehensive formative assessment process leads to classroom climate shifts and improved student achievement.
Katey Arrington
Charles A. Dana Center, University of Texas, Austin

9 Sing; Move; Dramatize; Create Stories, Visuals, and Poems: Learn Math
General Interest Session
Math and arts integration provides opportunities for students to deepen their conceptual understanding, increase fluency, and apply ideas. It engages a wide range of learners and supports the Standards for Mathematical Practice. Come and experience the joy of learning math through the arts.
Linda Dacey
Lesley University, Cambridge, Massachusetts

10 Using Classroom Observational Data to Predict Achievement in Elementary Mathematics
Research Session
Results presented of a two-year evaluation of elementary mathematics classroom observational data (use of math concepts, student engagement, instructional environments, technology, and manipulatives) as predictors of student achievement. Data from 2,500 classroom observations in seventeen schools were used to predict math achievement in five core areas.
Carla J. Thompson
University of West Florida, Pensacola
Giang-Nguyen T. Nguyen
University of West Florida, Pensacola

11 Children’s Strategies to Solve Common Addition and Subtraction Situations
Pre-K–2 Session
Not all addition and subtraction problems are alike for children, which is why they use different strategies to solve them depending on their understanding. Teachers who know the differences among problem types and among the strategies children use to solve them can better assess their students’ mathematical understanding and ask better questions to help them.
Nesrin Sahin
University of Central Florida, Orlando

12 Empowering Students to Deconstruct Word Problems
Pre-K–2 Session
Solving word problems is not about underlining key words. Just as writers use organizers, mathematicians need specific models to deconstruct the meaning inherent in addition and subtraction word problem types. Discover the tape diagram model, a problem-solving tool that empowers students to persevere and develop grit in the math classroom.
MaryJo Wieland
Curriculum Associate, Common Core, Inc., Montvale, New Jersey
Lisa Watts-Lawton
Curriculum Associate, Common Core, Inc., Los Angeles, California
13
PK–2 Students as Problem Solvers

Pre-K–2 Session

What is the role of problem solving in PK–2 mathematics? What are the essential elements of rich tasks in the PK–2 classroom? In this session, you will explore several robust problem solving tasks across multiple CCSSM content domains and practice standards. We will also examine student work samples to investigate common strategies and misconceptions.

Jenni K. McCool
University of Wisconsin-La Crosse
Jennifer J. Kosiak
University of Wisconsin-La Crosse
Kim A. Markworth
Western Washington University, Bellingham

260 (BCEC)

14
Pre-K and Kindergarten: It’s Not Just Babysitting!

Pre-K–2 Session

Learn how number instruction in the first years of school prepares students to be successful in the highest levels of math! Effectively sequencing how you teach numbers 1–10 and then 10–20 matters? Find out how our youngest students count, interpret, and understand numbers using developmentally appropriate strategies and models.

Lacy Endo-Peery
Curriculum Associate, Common Core, Inc.; Professional Development Specialist, Common Core, Inc., Woodland Hills, California
Kate Austin
Curriculum Associate, Common Core, Inc.; Owner, Green Hat Education, Washington, D.C.

161 (BCEC)

15
Listening to Children: Each Is Amazing

Pre-K–2 Session

Participants will learn about practices that (a) support all students to explain their mathematical ideas, (b) enable teachers to hear what each student says, and (c) use what they hear to support learning. The session draws on cognitively guided instruction research and makes use of a range of video examples of students, teachers, and classrooms.

Megan L. Franke
University of California, Los Angeles

BALLROOM EAST (BCEC)

16
Math Workshop: Guided Math and Differentiation

3–5 Session

Math Workshop is a structure for mathematics instruction that focuses on differentiation. Learn why it is a valuable vehicle for learning and how to establish routines and procedures that will allow student choice, meaningful small-group guided math, and engaging learning stations. Teaching mathematics just got easier and more fun for everyone!

Jennifer Wolfe Lempp
Fairfax County Public Schools, Virginia

108 (BCEC)

17
Understanding Math with PBS LearningMedia: The Elementary Years

3–5 Session

Number relationships, units of measure, describing and analyzing shapes—just some of the mathematical concepts that benefit from deep visual and spatial understanding. Developing these concepts through narrative approaches can be both effective and fun. Join us for a targeted exploration of free PBS LearningMedia resources for elementary education.

Rachel Connolly
WGBH Education/PBS LearningMedia, Boston, Massachusetts

211 (BCEC)

18
Developing Mathematical Thinking through Award-Winning Literature

3–5 Session

The purpose of this session is four-fold: (1) introduce the concept of paired text, (2) use one award-winning paired text to demonstrate how paired text can teach mathematical content and practices, (3) promote ways for teachers to develop paired text, and (4) share a theoretical model for using trade books to address CCSS in mathematics.

William P. Bintz
Kent State University, Ohio
Sara Delano Moore
ETA hand2mind, Vernon Hills, Illinois

FANEUIL (WESTIN)
19  
**Real Possibilities: The Versatility of the Number Line**  
3–5 Session  
We will examine how the number line can be used to help deepen students’ understanding of whole numbers, fractions, and decimals. This highly versatile but often underused tool can be used to solve elapsed time problems, compare numbers, perform operations, and plot measurement data. It can even be rotated vertically, to round numbers.  
_Saffron L. VanGaider_  
Curriculum Associate, Common Core, Inc.; Teacher, Spencer-Van Etten Elementary School, Washington, D.C.  

20  
**Blended Learning, Blended Pedagogies, Blended Content**  
6–8 Session  
Successful blended learning involves more than a mix of teacher-led and technology-based activities. It requires a blend of pedagogies to support the varied instructional needs of a rigorous curriculum that demands procedural fluency, conceptual knowledge, and application. Come see how to blend these elements and maintain mathematical coherence.  
_David Dockterman_  
Harvard University, Cambridge, Massachusetts  

22  
**Are Mathematical Practices Visible in Your Classroom Tasks?**  
6–8 Session  
Tasks typically provided in textbooks and publishers’ tests can often be modified to enhance students’ opportunities to engage with the Common Core mathematical practices (SMPs). This session will explore strategies for modifying tasks across the major middle grades content strands to increase student engagement in the SMPs and make their thinking visible.  
_Barbara Zorin_  
University of South Florida St. Petersburg  
_Patricia D. Hunsader_  
University of South Florida Sarasota-Manatee  
_Denisse R. Thompson_  
University of South Florida, Tampa  

23  
**Building the Base and Attaching the Altitude: Measuring Triangles**  
Research Session  
Come join us in a discussion of students’ thinking about the base and height of triangles presented dynamically. We will share videos of students engaged in tasks that helped reveal misconceptions. Leave with research-based tasks designed to promote meaningful classroom discussion about students’ definitions of the base and height of a triangle.  
_Jeffrey E. Barrett_  
Illinois State University, Normal  
_Craig J. Cullen_  
Illinois State University, Normal  
_Pamela S. Beck_  
Illinois State University, Normal  

24  
**Teaching Division with Fractions under CCSSM**  
Preservice and In-Service Session  
The Common Core State Standards for Mathematics (2010) proposed multiple ways to teach students to understand division with fractions. The presentation will unpack those multiple ways including creating visual models and story contexts, and drawing on the relationship between multiplication and division and division as fractions.  
_Xue Han_  
Dominican University, River Forest, Illinois  

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in San Francisco, CA • April 13–16
25
Using *MTMS* Solve It! Tasks in the Classroom

6–8 Session

Tasks from recent issues of *Mathematics Teaching in the Middle School* will be used as a springboard to discussion. Editors will briefly discuss the intent of the tasks, and a classroom teacher will reflect on using the tasks with students. Participants will be encouraged to interact with the tasks, the editors, and the teachers during the session.

Sherry L. Bair
Texas A&M University–Corpus Christi

JoAnn Cady
University of Tennessee, Knoxville

Walter Stark
St. Pancras Middle School, Glendale, New York

COMMONWEALTH C (WESTIN)

26
Changing Math Mindsets for Struggling Learners and Their Teachers

General Interest Session

Higher expectations for student learning needs to be accompanied by the belief that everyone can learn. Learn how our district is working with teachers to address mindsets through the use of research and data with curriculum and professional development. Strategies, resources, and tools will be shared to work with teachers, parents, and students.

Samantha Wuttig
Fairbanks North Star Borough School District, Alaska

Melanie Hadaway
Fairbanks North Star Borough School District, Alaska

Michelle Daml
Fairbanks North Star Borough School District, Alaska

253 B (BCEC)

27
Incredible Math Tasks! Supporting Productive Struggle in Learning Mathematics

6–8 Session

In this hands-on session, we will explore how to use worthwhile math tasks to support students’ productive struggle. We will examine student work and videos to explore how tasks, paired with teacher moves and questions, can promote student engagement in the Standards for Mathematical Practice. Leave with 200+ resources you can use Monday morning.

Bill Barnes
Howard County Public Schools, Maryland

Jenny Novak
Howard County Public Schools, Maryland

258 A (BCEC)

28
Making Mathematics More Relevant through Integrated STEM

6–8 Session

This presentation will provide participants with a general description of integrated STEM education and the different ways that it can be implemented in the mathematics classroom. Examples will be provided on how integrated STEM education makes mathematics more relevant to students.

Cathrine Maiorca
University of Nevada, Las Vegas

Travis Olson
University of Nevada, Las Vegas

107 A (BCEC)

29
Connecting the Dots in Your Classroom

9–12 Session

*Principles to Actions* encourages high school teachers and leaders to connect mathematical ideas among the content strands. In this fast-paced session, one of the lead authors of the document will examine several examples of rich tasks that allow high school students to make connections by using a variety of representations.

Daniel J. Brahier
Bowling Green State University, Ohio

154 (BCEC)
8:00 A.M.–9:00 A.M.

30
Geometry and . . . (Units to Captivate Our Captive Students)
9–12 Session
Create “units” which connect textbook geometry to mathematical and nonmathematical fields so that we can deepen understanding of shapes, similarity, scale, and proof, as well as aid in the development of “visual strength.” Specific examples include selections from Euclid and Lobachevsky, as well as examples from chemistry, art, and literature.

Andrew Freda
Deerfield Academy, Massachusetts

What? You Mean MY Ancestors Helped Invent Math?
9–12 Session
Mathematics is a cultural art developed over thousands of years by people from all parts of the Earth. Modern math textbooks and curricula often overlook this. This presentation will teach you how to incorporate discoveries from many cultures, including China, India, Egypt, and Babylonia, into the math topics you already teach.

Gary Rubinstein
Stuyvesant High School, New York, New York

31
Improving Student Success by Spiraling Activity-Based Learning
9–12 Session
We have improved student engagement and increased student achievement by making hands-on activities central to student learning. By eliminating units, we can spiral back to the big ideas to allow students multiple opportunities to extend their learning and demonstrate their understanding. Cups, ropes, and dominoes have transformed our practice.

Bruce D. McLaurin
Glebe Collegiate, Ottawa, Canada
Alexander M. Overwijk
Glebe Collegiate, Ottawa, Canada

32
Technology Used in the Flipped and Traditional Classroom
9–12 Session
Learn how we use Google products, other freeware, and existing classroom technologies in our flipped and traditional class. We’ll show you how we’ve successfully implemented these strategies in our classes from Algebra 1 to Calc BC. Join us to see how you can enhance your classroom instruction whether you have flipped none, some, or all of your lessons.

Beverly Heigre
Notre Dame High School, San Jose, California
Elizabeth Milanovich
Notre Dame High School, San Jose, California

34
Mathematical Practices and Connected Mathematical Thinking in Secondary Mathematics
Preservice and In-Service Session
Principles to Actions calls for engaging students intensely in making sense of mathematical ideas, and doing so requires teachers to experience the mathematics they teach in deep and connected ways. Strategies and practice-based tasks for engaging secondary teachers and learners in mathematical practices and in deep mathematical thinking will be shared.

M. Kathleen Heid
Pennsylvania State University, University Park

35
Talking about Mathematics: Teachers’ Use of Contexts and Casual Language
Higher Education Session
“If you divide by 0, you’ll go to math prison!” Findings from a qualitative study of seven secondary teachers’ efforts to make ideas of school algebra accessible to students will be shared. This session will focus on their creative use of language and contexts as they endeavored to support the interaction between students and ideas of school algebra.

Jeanne K. Shimizu
SUNY Old Westbury, New York

259 A (BCEC)

252 B (BCEC)

209 (BCEC)

159 (BCEC)
8:00 A.M.–9:00 A.M.

36 Engaging Learners and Realizing the Development of Mathematical Practices
Higher Education Session

Examining the role of problem solving, perseverance, and reasoning in the context of mathematics teacher education is essential to support the development of key mathematical practices described by CCSSM. We will engage in activities and discuss methods that support future and experienced teachers as they involve students in essential mathematics.

Trena Wilkerson
Board of Directors, National Council of Teachers of Mathematics; Baylor University, Waco, Texas
Keith Kerschen
Baylor University, Waco, Texas
Alexa Samuel
Baylor University, Waco, Texas

36.1 Teaching Number Sense with Math Buddies, the Singapore Online Resource
General Interest Exhibitor Workshop

Research shows that number sense is built on mastery of place value as well as number facts. We’ll discuss place value as a fundamental element of Singapore Math as well as number bonds and part-whole thinking. We’ll make use of Math Buddies, a K–5 digital resource, to take students through the concrete-pictorial-abstract approach to number sense.

Marshall Cavendish Education
Tarrytown, New York

36.2 1:1 Math Instruction for Grades K–12 with a Single App!
Pre-K–12 Exhibitor Workshop

This session will demonstrate how using the HMH Player app for 1:1 instruction with your HMH 2015 Math Programs can excite and energize you and your students. See how this one app is appropriate for K through 12. You will learn about teacher tools including demonstration tools, customizing lessons, student-teacher-student collaboration, and more.

Houghton Mifflin Harcourt
Boston, Massachusetts

36.3 Lone Star Learning Increases Student Success & Decreases Teacher Effort!
3–5 Exhibitor Workshop

Enjoy TEXAS-SIZE hospitality and generosity! All workshop attendees receive a year’s subscription for our Teacher’s Choice Award Winning Daily Problem Solving Product! Play “A Minute To Win It” and enjoy other amazing games and ideas you’ll use in your classroom Monday to ensure your students are Multiplication Masters, Fraction Fanatics, and Vocabulary Victors! Y’ALL COME!

Lone Star Learning
Lubbock, Texas

36.4 Making Failure Fun: Amplify Math Games
6–8 Exhibitor Workshop

Participants will learn about Amplify’s unique approach and process in developing math games. Learn how Amplify sees games as a voluntary activity for learning in the student’s free time, and discover what we have learned through trial and error in the design process. Get firsthand experience with Twelve, available now in the Apple app store.

Amplify
Brooklyn, New York

New to Teaching? Get answers to pivotal questions and concerns of new and soon-to-be teachers at the New Teacher Strand on Thursday and Friday.
8:00 A.M.–9:00 A.M.

36.5 Prepare Your Students for Algebra Success
3–12 Exhibitor Workshop
Despite a variety of approaches to attack the problem, the algebra fail rate has remained stubbornly high in many of our schools. Learn about onRamp to Algebra, an intervention solution to ensure at-risk students are successful in Algebra 1. onRamp to Algebra is designed to build and solidify foundational skills and conceptual understanding necessary to be successful in Algebra using explicit instruction, peer-assisted learning, and independent practice with scaffolded supports.

Pearson
Upper Saddle River, New Jersey

36.6 Mathspace: Why You’ll Never Grade Math Assignments Again. Seriously!
6–12 Exhibitor Workshop
Meet Mathspace. You’ve seen it all, right? Adaptive learning? Yep. Handwriting recognition? Umm. . . Every math question graded step-by-step? Whoa, that’s new! Imagine: Automatic grading, so you focus on teaching; handwritten answers, showing full work, with real-time feedback; no more multiple choice! World-class math software—come get a FREE trial!

Mathspace
New York, New York

8:00 A.M.–9:15 A.M.

37 NCTM PDSC: Building Mathematics Learning Communities Using NCTM Reflection Guides
Preservice and In-Service Gallery Workshop
NCTM provides free online professional development guides for many of its print resources. In this session, participants will explore the PD guide for NCTM’s latest landmark publication Principles to Actions: Ensuring Mathematical Success for All. Presenters will model ways to use PD guides to support professional learning in your school.

NCTM Professional Development Services Committee
National Council of Teachers of Mathematics, Reston, Virginia

38 A Hop, Skip, or a Jump: Discovering Number Paths
Pre-K–2 Gallery Workshop
As a K–2 teacher, are you aware of the research introducing number paths before number lines to support addition and subtraction fluency, as well as number sense? In this session, participants will engage in hands-on use of these tools and explore how they can support their instruction in developmentally appropriate ways.

Carrie J. Plank
University of Alabama in Huntsville

39 Fact Fluency Games for Building Competency with the Common Core
Pre-K–2 Gallery Workshop
Do your students still struggle with fact fluency? Are you looking for engaging and effective activities to help them gain confidence and competence with the Common Core? Come prepared to play games that incorporate the use of cards and dice and that integrate practice with strategies including doubles, making tens, the commutative property, and fact families.

Jane Felling
Box Cars and One-Eyed Jacks, Edmonton, Canada

40 Stop! Help! I Thought You Knew How to Make Shapes
Pre-K–2 Gallery Workshop
This interactive workshop will focus on the concrete and representational forms of geometry for early learners. Participants will engage in creating, reading about, drawing, combining, and subdividing geometrical shapes. They will incorporate modalities and literature to reinforce geometric vocabulary. Students’ misconceptions will be addressed.

Brenda Dorman
Norfolk Public Schools, Virginia
Laura Gray
Norfolk Public Schools, Virginia
41
What’s in Your Tool Kit? (Numeracy Tools You Can’t Live Without)
Pre-K–2 Gallery Workshop
“What the heck is a rekenrek?” “What’s the game with a ten-frame?” “Where’s the math with a number path?” It’s easy to be overwhelmed with the amount of tools on the market! Let’s revisit the best tools and how they impact young brains, discuss ways to increase math talk, and play engaging activities so we can make good lessons great!

Toni Osterbuhr
Wichita Public Schools, Kansas
Debbie M. Thompson
Wichita Public Schools, Kansas

42
Do You Really Know Your Place (Value)?
Preservice and In-Service Gallery Workshop
Travel with us to imaginary Vierland where you will be immersed in a base 4 number system that will challenge your place value understanding. On your journey, you will discover and enhance your level of understanding of place value that can be translated into instructional strategies applicable to base 10 instruction.

Annette Cornelius
University of Memphis, Tennessee
DeAnna N. Owens
University of Memphis, Tennessee

43
Meaningful Multiplication: Giving Students the Ability to Reason about Computation
3–5 Gallery Workshop
Students are often taught multiplication procedures without focusing on the value of each digit. Walk away with a sequence for developing conceptual understanding of multiplication using arrays, area models, the distributive property, and place value units. Introduced alongside models, the algorithm for multiplication evolves and now has meaning.

Kelly Alsup
Curriculum Associate; Common Core, Inc., Chicago, Illinois
Adam Baker
Curriculum Associate; Common Core, Inc., Marlboro, New York

44
Millions, Billions, and Double Trouble
3–5 Gallery Workshop
Discover innovative, hands-on activities to help students understand very large numbers and the effects of doubling using real-world examples from the environment and the global community. Presented games and simulations enhance students’ abilities in measurement, data analysis, and graphing representation.

Kenneth Jones
Columbus State University, UTeach Columbus, Georgia

45
Increasing Strategies for English Learners without Decreasing Cognitive Demand
3–5 Gallery Workshop
How do you support English learners without lowering the cognitive demand of tasks? We will explore ways to modify and implement rich mathematics tasks to accommodate English learners without lowering the cognitive demand. Learn effective teaching strategies to help all students access rich mathematics and participate in the mathematical practices.

Ji Yeong I
University of Missouri, Columbia
Zandra U de Araujo
University of Missouri, Columbia

45.1
Support Math Reasoning by Linking Arithmetic to Algebra
3–5 Gallery Workshop
The session offers examples of how students reason as they articulate, represent, and justify generalizations about the operations. Teachers can incorporate this work into their arithmetic instruction by linking together two of the Mathematics Teaching Practices in NCTM’s Principles to Actions (use and connect representations, and facilitate meaningful mathematical discourse).

Virginia Bastable
Mount Holyoke College, South Hadley, Massachusetts
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8:00 A.M.–9:15 A.M.

46 Engaging Students with Open-Ended Tasks That Promote Statistical Thinking
6–8 Gallery Workshop
Experience, share, and design open-ended statistical tasks that motivate and engage students in using data to support arguments, make decisions, and draw conclusions. Learn how to ask questions that promote distributional reasoning and motivate the need for coordination of measures of center and spread.

Tyler Pulis
Amplify Learning/North Carolina State University, Durham/Raleigh
Blake Whitley
North Carolina State University, Raleigh

47 STAT(S)!: Critical Thinking Activities with Statistics
6–8 Gallery Workshop
This highly participatory workshop will engage teachers in discussing and solving real world statistical tasks aligned to the CCSS to build their confidence. Emphasis will be placed upon the development of concepts over the grade band. Participants will solve problems and examine student work. Connections to the practices will be made.

Michelle McHugh
Westwood Public Schools, Massachusetts
Kate Ariemma Marin
Westwood Public Schools, Massachusetts
Marcie Abramson
Westwood Public Schools, Massachusetts

48 Tapping the Potential of Struggling Learners of Mathematics: Instructional Strategies
6–8 Gallery Workshop
Have trouble reaching struggling mathematics students? In today’s classrooms, mathematical knowledge is not enough; teachers must find creative ways to unlock potential in their students. In this session, participants will engage in classroom-ready, research-based strategies and hands-on activities to help tap the potential of struggling students.

Craig Schroeder
Fayette County Public Schools, Lexington, Kentucky
Christa Jackson
University of Kentucky, Lexington
Margaret Mohr-Schroeder
University of Kentucky, Lexington

49 What Does It Look Like: Visualization with Middle School Content
6–8 Gallery Workshop
This session will engage participants in activities that allow for visualization of their mathematics. We will start with concrete, then pictorial representation, and end with the abstract “rule” or procedure. These tools address the requirement for students to not only know the rules of mathematics, but truly understand the meaning behind them.

Carrie Treusch
Highline Public Schools, Burien, Washington

50 What’s New in CCSS Middle School Proportional Reasoning?
6–8 Gallery Workshop
Double number lines, tape diagrams, ratio tables . . . Come see new tools students will grapple with while solving problems, discuss coherence through the grade levels, and connect learning to the CCSS practice standards.

Mark Goldstein
Center for Mathematics and Teaching, Los Angeles, California
Cynthia Raff
Center for Mathematics and Teaching, Los Angeles, California
51
Designing the Nuts and Bolts of Your PBL Unit
9–12 Gallery Workshop
Roll up your sleeves and let’s get to work! Design the nuts and bolts of a PBL unit, and receive feedback on your plans. Learn design ideas and resources for creating your own projects, and building and sustaining a PBL culture in your classroom. Bring back to your school and community a product that addresses rigor, relevance, and relationships.

Jean Lee
University of Indianapolis, Indiana
Enrique Galindo
Indiana University, Bloomington

52
Functions as Dances: Experience Variation and Relative Rate of Change
9–12 Gallery Workshop
How better to explore rate of change than as independent and dependent variables dancing together? We’ll vary x and y by doing both real and computer-based dances based on geometric transformations, dynagraphs, and Cartesian graphs of various functions. Bring a laptop or iPad with Sketchpad. Leave with student-ready geometry and algebra activities.

Daniel Scher
KCP Technologies, New York, New York
Scott Steketee

53
Here’s How to Incorporate “Big Data” into Your Statistics Class!
9–12 Gallery Workshop
Come and engage in classroom-tested activities involving three aspects of statistical investigations: Gather and analyze experimental data from hands-on-tasks; use TI-84 programs to simulate sets of “big data” for these tasks; and finally, investigate the mathematical models that explain the patterns observed in both real and simulated data.

Patricia Baggett
New Mexico State University, Las Cruces
Andrzej Ehrenfeucht
University of Colorado, Boulder

54
Using Manipulatives and Investigations in Geometry
9–12 Gallery Workshop
Participants will use hinged mirrors, rubber bands, patty paper, and paper plates to do interesting problems to develop and apply geometry concepts and review vocabulary. The CCSS mathematical practices will be processed as we do the activities. Topics include similarity, triangle heights, transformations, central angles, polygons, area, and more.

Karen Wootton
CPM Educational Program, Sacramento, California
Christine Mikles
CPM Educational Program, Sacramento, California

55
Winning the Battle: Using Logic Puzzles to Teach Reasoning
6–8 Gallery Workshop
Moving the classic Battleships game to the mathematics classroom, we will explore some basic deductive reasoning and problem-solving strategies to solve Battleships puzzles. We will also look at how this puzzle type can be adapted to different grade levels and abilities. Come with an open and inquisitive mind and a sharpened (or mechanical) pencil!

Jeffrey J. Wanko
Miami University, Oxford, Ohio

The NCTM Member Services, located inside NCTM Central in the Exhibit Hall, has activities, lessons, sample journals, and more—Stop by!
8:00 A.M.–9:15 A.M.

56  
Make Math Come Alive for Algebra 1 Students!  
9–12 Gallery Workshop  
President’s Series presentation  
Explore engaging algebra 1 tasks that focus on real-world applications and modeling. Find out how these tasks can be used to promote classroom discourse and problem solving. Learn how to encourage perseverance as students grapple with rigorous problems. Consider some strategies for adjusting curriculum to include more real-world applications.  
Amy T. Herman  
Council of Presidential Awardees in Mathematics (CPAM), Louisville, Kentucky

57  
Regression for Non-Linear Data: Don’t Let Students Go Model Shopping  
9–12 Gallery Workshop  
If we want to find a model for a quadratic data set, we have the option of having our calculator perform QuadReg. This regression technique does not help students deepen their understanding of transformations or shed light on the graph of the resulting model. We will use linear regression to find quadratic models in an inventive way.  
Julie L. Graves  
North Carolina School of Science and Mathematics, Durham

58  
Thought-Provoking, Invigorating Games/Puzzles to Implement Common Core–Based Explorations  
9–12 Gallery Workshop  
Play with puzzles. Experience a board game with humans as pieces. Create a pop-up card to describe the winning strategy. Explore creative ways to implement the Common Core mathematical practices as students investigate solutions based on exponential and polynomial functions. Come to play, and leave with engaging projects for your classroom!  
Gail Kaplan  
Towson University, Maryland

9:30 A.M.–10:30 A.M.

59  
Integrating Project-Based Learning: Teaching Mathematics across the Curriculum  
Preservice and In-Service Gallery Workshop  
Project-based learning (PBL) is a dynamic method for developing math models, and for increasing communication and problem solving in our classrooms. It also promotes collaboration with colleagues within and outside our discipline. In this session you will learn how to design and implement PBLs to both master standards and create a community of learners.  
Anthony Matthew Rodriguez  
Providence College, Rhode Island

60  
New Teacher Workshop & Kickoff  
Preservice and In-Service Gallery 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 others still in school, just starting, in their early career, or looking for help. Receive gifts, prizes, and good ideas.  
David Barnes  
National Council of Teachers of Mathematics, Reston, Virginia

9:00 A.M.–9:15 A.M.

61  
Mathematical Modeling from Primary School to Teacher Education  
General Interest Session  
Mathematical Modeling, that is linking mathematics to real world situations and problems, has become an important practice of the Common Core State Standards in the United States. Hence mathematics teachers must have a strong background with respect to different aspects of modeling and appropriate methods of how modeling can be taught. In our presentation, we will give concrete examples of how mathematical modeling can be efficiently taught and learned in primary school, in secondary schools and in teacher education, based on long-term practical experiences, on teaching/learning theories and on empirical research.  
Werner S Blum  
University of Kassel  
Rita Borromeo Ferri  
University of Kassel

GRAND BALLROOM D (WESTIN)
9:30 A.M.–10:30 A.M.

62
A Math Coach’s Playbook for a Successful First Year
General Interest Session
Thinking about becoming a math coach? Come learn about the transition from classroom teacher to mathematics coach. Explore tools and strategies to help guide and support adult learning and increase student achievement. Three unique experiences will be shared to build school community relationships, create change, and foster professional growth.

Kisha Davis-Caldwell
Howard County Public Schools, Ellicott City, Maryland
Susan A. Jensen
Howard County Public Schools, Ellicott City, Maryland
Kristen L. Mangus
Howard County Public Schools, Ellicott City, Maryland

260 (BCEC)

63
Teaching Mathematics in Inclusive Classrooms in Five Fairly Easy Steps
General Interest Session
Practical methods for teaching mathematics in inclusive classrooms can help today’s teachers reach all students. The presenters will share lessons, activities, and tools developed in a collaborative effort between special education and mathematics departments in order to provide K–12 teachers the strategies and support needed to teach effectively.

Edel Reilly
Indiana University of Pennsylvania
Joann M. Migyanka
Indiana University of Pennsylvania

211 (BCEC)

64
The Practices in Practice
General Interest Session
The Common Core State Standards include eight Standards for Mathematical Practice. In this presentation we will give some illustrations of what those standards might look like in the classroom, how they live in different ways in different content areas, and what sorts of tasks and activities might promote them.

William G. McCallum is a University Distinguished Professor of Mathematics at the University of Arizona. Born in Sydney, Australia, he received his PhD in Mathematics from Harvard University in 1984 and joined the faculty at the University of Arizona in 1987. In 1989 he joined the Harvard calculus consortium, and he is the lead author of the consortium’s multivariable calculus and college algebra texts. In 2005 he received the Director’s Award for Distinguished Teaching Scholars from the National Science Foundation. In 2006 he founded the Institute for Mathematics and Education at the University of Arizona, and he is currently its director. In 2009–2010 he was one of the lead writers for the Common Core State Standards for Mathematics.

William G. McCallum
Illustrative Mathematics, Tucson, Arizona

BALLROOM EAST (BCEC)

65
What’s Common in the Post–Common Core Era?
General Interest Session
President’s Series presentation
Four years after the promise of common standards across the United States, we now face the reality that not every state will join or remain part of the Common Core State Standards movement. Does that mean we have nothing in common? Does that mean the promises cannot be kept? Does it mean we go back to our pre-CCSS islands? Absolutely not!

Diana L. Suddreth
Association of State Supervisors of Mathematics, Salt Lake City, Utah

253 B (BCEC)
**65.1**

**Grand Challenges in Mathematics Education**

**General Interest Session**

Mathematics education teachers, leaders, and researchers seek answers to important questions that will ultimately result in the enhancement of teaching, learning, curriculum, and assessment. Other fields have identified these questions as Grand Challenges as a way to channel energy towards solving significant problems that can change the world. If the field of mathematics education were to identify a list of Grand Challenges, what might the list include? How could we initiate a process to generate that list? Are you a classroom teacher? We want to hear from you! Help us capture your important insights. We invite you to learn about this new NCTM initiative, provide ideas, and engage in a discussion about the future of this endeavor.

NCTM Research Committee
National Council of Teachers of Mathematics, Reston, Virginia

**205 B (BCEC)**

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**66**

**How Instilling Positive Early Attitudes Toward Math Leads to Success**

**Pre-K–2 Session**

Let’s help our students develop positive attitudes about math. They need to be fully engaged in creating math models, persistent in completing their work, and motivated to advance their mathematical skills. This session will demonstrate how we can work with children to focus their behaviors and develop productive dispositions toward mathematics.

Stuart J. Murphy
Self-Employed Consultant, Boston, Massachusetts

**205 B (BCEC)**

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**67**

**No More Tears over Tier 2 Interventions!**

**Pre-K–2 Session**

Meet all eight of the recommendations for Tier 2 interventions in a problem-solving setting, using visual models and genuine questioning. Focus on the essential work in numeracy, learn more about how to monitor progress, and make explicit instruction for Tier intervention time in your building and district work without tears.

Laurie Kilts
Natrona County School District #1, Casper, Wyoming

**107 A (BCEC)**

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**68**

**Apps Used by Primary Students to Show Understanding**

**Pre-K–2 Session**

Do you wonder how to get first or second graders to explain their thinking about math problems? Do you wish you could use a device to record first graders’ diagrams and verbal explanations? Find out how the Newton, Massachusetts, school district used iPads in elementary classrooms to facilitate students’ exploration of the Common Core Standards for Mathematical Practice 1, 2, and 3.

Jesse Winch
Newton Public Schools, Massachusetts
Lauren Dietz
Newton Public Schools, Massachusetts
Andrew Guttell
Newton Public Schools, Massachusetts

**259 A (BCEC)**

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**69**

**Profiles of Student Reasoning in Number and Operations**

**Research Session**

This presentation shares different student-reasoning profiles. The profiles were developed through the examination of students’ (in grades 2–6) conceptual and procedural reasoning on whole-number and fraction comparison problems from the Math Reasoning Inventory (Burns, 2012). The profiles can be used to assess students’ reasoning and number sense.

Sarah Quebec-Fuentes
Texas Christian University, Fort Worth
Kristina Higgins
Texas Christian University, Fort Worth
Lindy Crawford
Texas Christian University, Fort Worth

**160 A (BCEC)**
9:30 A.M.–10:30 A.M.

71 Math from the Past Can Help Your Students Today
6–8 Session
The presentation will reveal the personalities behind mathematicians from the past and consider some of the mathematics they developed. A key part of my presentation will be a number of problems from the past that are suitable for students to solve in their mathematics classes.

Hugh Burkhardt
Shell Center for Mathematical Education, Nottingham, United Kingdom
210 B (BCEC)

72 Effective Teaching Practices to Support English Language Learners
6–8 Session
Learn about the specific demands of teaching mathematics for English language learners, especially related to modeling and communication math practices. Support students to make assumptions and reflect on their solutions by means of technology, comparisons of word and modeling problems, and well-planned interrelated social and analytic scaffolding.

José Francisco Sala García
Balearic Education Council, Ibiza, Spain
252 B (BCEC)

73 Learning Math by Making Mistakes
6–8 Session
Wouldn’t it be nice to have your students get everything right all the time? Not really! Teach your students to view making mistakes as powerful learning opportunities and create a classroom environment where persistence and perseverance through mistake-making are expected and appreciated.

Karen G. Gartland
Groton-Dunstable Regional School District, Massachusetts
106 (BCEC)

74 IM
Tasks, Formative Assessment, and the Mathematical Practices
3–5 Session
Among the new things in the Common Core, the mathematical practices present the greatest challenge—to teachers and to assessment designers. This talk will show how using rich assessment tasks for summative and formative assessment can improve student learning—particularly when used as an integral part of teaching and learning in the classroom.

Hugh Burkhardt
Shell Center for Mathematical Education, Nottingham, United Kingdom
210 B (BCEC)

75 Mean Absolute Deviation in Sixth Grade? Don’t Get MAD!
6–8 Session
Do you find the statistics standards from the middle school CCSS perplexing? dense? confusing? We’ll unpack the meaty parts of the statistics 6–8 standards and look at as some examples of how to make them come to life in the classroom. Topics will include variability in data, measures of center, measures of spread, and representative sampling.

Ellen B. Metzger
Lincoln Public School, Massachusetts
154 (BCEC)

76 Building Students’ Understanding of Rational and Irrational Numbers
6–8 Session
Achievement data indicates that rational and irrational numbers are difficult for most children (NAEP 2011; 2013). This session is specifically designed to provide lesson ideas on fractions, decimal fractions, and decimal expansions, and to help teachers build children’s understanding of rational and irrational numbers, their properties, and number sets.

Aina K. Appova
The Ohio State University, Columbus
COMMONWEALTH C (WESTIN)
**77**
**Problem-Solving Tasks Fostering Mathematical Discourse**
*Preservice and In-Service Session*

In this workshop, participants will work on two problems related to place value and divisibility. Through the problem-solving process we highlight three of the Mathematics Teaching Practices from from NCTM’s *Principles to Actions*: facilitating meaningful mathematical discourse, posing purposeful questions, and supporting productive struggles.

Gulden Karakok  
University of Northern Colorado, Greeley  
Katie Morrison  
University of Northern Colorado, Greeley

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**78 SL**
**Algebra Nation: Students Learning Algebra in and beyond the Classroom**
*9–12 Session*

The University of Florida and Study Edge, an e-learning innovator, have developed Algebra Nation, an effective, free, online resource that supports students studying algebra. Algebra Nation is available 24/7, providing a social learning platform and instructional tools where students can obtain assistance from tutors, teachers, and their peers.

Don Pemberton  
University of Florida Lastinger Center for Learning, Gainesville

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**79**
**Assessing PBL: Relating Student Work to the Practice Standards**
*9–12 Session*

Many teachers new to PBL are challenged by assessing students’ mathematical practice skills and discourse ability in a PBL classroom. How do we encourage students in these ways while still assessing content and mastery? Rubrics and methods of assessment that have worked in the PBL classroom will be shared and discussed.

Carmel Schettino  
Deerfield Academy, Massachusetts

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**80**
**Learning Styles: Reaching the Students Who Think in Different Ways**
*6–8 Session*

Do students constantly ask you to repeat? Do they make “silly” mistakes, or want step-by-step directions for every procedure? Do they need help making connections? These are signs that they process math differently from the way you do. This session will describe two basic learning styles and provide strategies for meeting the needs of all students.

Rita H. Barger  
University of Missouri–Kansas City  
Eddie L. Smith  
Northwest Missouri State University, Maryville

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**81**
**Online Environment to Support Formative Assessment, Instructional Planning, and Collaboration**
*Research Session*

The NSF-funded EnCoMPASS project supports teachers to look closely and collaboratively at students’ responses to open-ended rich tasks and use the resulting insights to inform their instruction and generate effective feedback. We will share the ways teachers are using this online environment and how it has impacted their practice.

Valerie Klein  
The Math Forum @ Drexel, Philadelphia, Pennsylvania  
Jason Silverman  
Drexel University School of Education, Philadelphia, Pennsylvania

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**Make time to explore the Exhibit Hall for the latest educational resources!**
9:30 A.M.–10:30 A.M.

82
Removing the Fear of Fractions from Your Students
9–12 Session
Imagine a world that does not dislike fractions! Presenting fractions is the key to your student’s success. This session will compare traditional to nontraditional strategies for simplifying, adding, and subtracting fractions. Did you know students can be taught to add and subtract fractions quickly in their heads without finding a common denominator?

Joseph C. Mason
Hagerstown Community College, Maryland

83
Statistics and Probability: Implementing the CCSS Vision and Spirit
6–8 Session
The vision of the CCSS statistics strand is more than “another year, another graph.” It is about reasoning from data, recognizing variability, understanding that statistics is not mathematics, and making decisions based on statistical thinking. How can we make this vision a reality in our classrooms and how can interactive dynamic technology help?

Gail Burrill
Past President, National Council of Teachers of Mathematics; Michigan State University, East Lansing
Thomas P. Dick
Mathematics Department, Oregon State University, Corvallis

84
Using Student Interests to Develop Quantitative Reasoning
6–8 Session
In today’s data-driven world, students of all ages must be prepared to analyze real-world information to make better decisions about everyday life. This session will provide examples of high-interest contexts and strategies to engage students’ interest while building math skills and positive dispositions. Classroom-ready resources will be provided.

Troy A. Thomas
University of Nevada, Reno
Lynda R. Wiest
University of Nevada, Reno

85
Flipping with a Twist: Promoting Inquiry while Flipping the Classroom
9–12 Session
This presentation encourages people to amend the usual method for a lecture/homework flipped classroom. I have added inquiry-based activities both before and after video lectures. Many of these activities can be done in other classes to promote understanding of Common Core concepts. We will simulate a two-day cycle of this form of instruction.

Jonathan M. Osters
The Blake School, Minneapolis, Minnesota

86
Keeping Students Engaged: Math in Art, Technology, and History
9–12 Session
Math in Art, Technology, and History class is designed for students who are more interested in STEAM (the A stands for ART) than STEM. The class explores mathematics through units such as the Golden Ratio, Math and Music, Tessellations, Architecture, Fractals, Origami, the History of Numbers and Counting, and Computer Animation.

David M. Peabody
Redmond High School, Washington

87
Quantitative Financial Literacy: A College/Career Readiness Advanced Algebra Option
9–12 Session
QFL is an algebra-rich, applications-oriented, technology dependent third- or fourth-year math course option for students of all ability levels. Selected topics from algebra 2, geometry, precalculus, and probability and statistics are used to model banking, credit, employment, taxes, auto ownership, housing, retirement, investing, budgeting, and more.

Richard J. Sgroi
Bedford Central Schools, New York
Robert K. Gerver
North Shore High School, Glen Head, New York
9:30 A.M.–10:30 A.M.

**88**
**Sustained Pre- and In-Service Teacher Collaboration: Promises and Challenges**

Preservice and In-Service Session

Teams of STEM master teachers and novice teachers, with university and NSF support, have been collaborating for three years. A panel of participating teachers will share their project experiences as well as lessons learned that are sure to benefit teachers and administrators. Impacts from mentoring and communities of practice will be highlighted.

Sandra R. Madden  
University of Massachusetts Amherst  
Beverly MacLeod  
Ralph C. Mahar Regional School, Orange, Massachusetts  
Deatrice L. Johnson  
Springfield Public Schools, Massachusetts

**88.1**
**A Balancing Act: Providing Grade-Level & Foundational Skills Practice**

General Interest Exhibitor Workshop

Do you struggle with providing effective math practice for grade-level standards and foundational skill development? The new Accelerated Math 2.0 & STAR Math help you find this balance in your classroom! Learn how teachers get the help they need to advance students from kindergarten through high school and better prepare them for college and career.

Renaissance Learning  
Wisconsin Rapids, Wisconsin

**88.2**
**Coaching for Cognitive Dissonance: Using Video to Promote Change**

Pre-K–8 Exhibitor Workshop

Dr. Juli Dixon creates an environment to support changing teachers’ practices within schools and districts by creating disequilibrium using classroom videos. She demonstrates that to support deep conceptual understanding, teachers need to see the difference between their current practice and that required by the CCSSM mathematical practices.

Houghton Mifflin Harcourt  
Boston, Massachusetts

**88.3**
**Amplify Math: Advance with Learning Progressions**

6–8 Exhibitor Workshop

Engage with a new digital math curriculum for grades 6–8 that balances problem-based lessons with scaffolded lessons to build conceptual understanding. Learn ways to emphasize the Common Core math practices and build procedural fluency through an adaptive independent practice app. Embedded digital tools create a dynamic collaborative environment.

Amplify  
Brooklyn, New York  
152 (BCEC)

**88.4**
**Building Concepts in Middle Grades Statistics**

6–8 Exhibitor Workshop

The Common Core standards describe the coherence and connection of math through the grade levels. In this session, we’ll explore free lessons that follow a developmental progression for statistics in the middle grades through the use of interactive technology. Learn how technology can be used to engage students and provide new ways to think about and discuss statistics.

Texas Instruments  
Dallas, Texas  
153A (BCEC)

**88.5**
**Using Hands-On Materials to Engage Students with Mathematical Practice Standards**

9–12 Exhibitor Workshop

Learn how students can make relevant connections to algebraic parabolas by using hands-on materials. Two types of delivery methods addressing the Standards for Mathematical Practice will be explored and discussed. MATH Connections solidify math concepts using teacher-led small-group activities, while MATH Expeditions provide a more student-directed approach to collaborative learning.

Pitsco Education  
Pittsburg, Kansas  
105 (BCEC)
Energizing Every Child to Learn, Love & Live Math™

eight skill sets | 180+ activities | updated content & assessment tools

FIRST IN MATH®
Visit us at booth 1128

firstinmath.com
© 2015 Suntex International Inc
9:30 A.M.–10:30 A.M.

88.6  

Is It Too Good to be True?
9–12 Exhibitor Workshop

Award-winning author Elayn Martin-Gay will introduce her new digital series for algebra 1, geometry, and algebra 2. This session will showcase an accessible approach to math lessons, student-friendly videos, and discuss organizational methods to help students achieve improved results. Learn how students will build college readiness with MyMathLab, the powerful program used at colleges nationwide.

Pearson
Upper Saddle River, New Jersey

151A (BCEC)

9:45 A.M.–11:00 A.M.

89  

Effective Mathematics Instruction Begins with Lesson Planning
3–5 Gallery Workshop

Intentional lesson planning is a practice essential to the daily work for effective mathematic instruction. Participants will explore the protocol “Thinking through a Lesson Plan” (TTLP) that actively engages students throughout a lesson. Selection and implementation of cognitively demanding tasks and teacher questioning will be investigated.

Arlene Mitchell  
RMC Research Corporation, Denver, Colorado
John Sutton  
RMC Research Corporation, Denver, Colorado

259 B (BCEC)

Visit www.nctm.org for lessons, activities, and teacher resources!

90  

Interesting Mathematical Tasks: Linking Mathematics Content and Instructional Practice
6–8 Gallery Workshop

In this workshop we will explore how the use of tasks engages students and improves our instructional practice. The collection of tasks modeled and discussed aligns with specific middle school content. As we engage in the tasks the role of teaching a growth mind-set will be explicitly noted. Rubrics for assessing students’ learning will be shared.

Rebecca Owens  
The Riverside School, Lyndonville, Vermont
Laurie Boswell  
The Riverside School, Lyndonville, Vermont

205 A (BCEC)

91  

Concrete to Abstract: Getting to the Core with Struggling Students
Pre-K–2 Gallery Workshop

Classroom grade 1 teachers will share practices that have supported their students in moving toward achieving grade-level standards. The session will be jam-packed with practical, easy-to-implement approaches for supporting learning at any tier of intervention.

Marianne V. Strayton  
Grade Level Lead Curriculum Associate, Common Core, Inc.; Teacher, Clarkstown Central School District, New City, New York
Beth Barnes  
Curriculum Associate, Common Core, Inc.; Hudson City School District, Hudson, New York

107 B/C (BCEC)

92  

3 Reasons Kids Don’t Know Facts and How to Help
Pre-K–2 Gallery Workshop

Children have an overreliance on counting, they lack number sense, and the manipulatives we use in the early grades actually hinder students’ abilities to progress to more advanced addition strategies. This session will discuss why these three ideas keep kids from being fluent with their addition facts and what we can do in the classroom to help.

Christina Tondevold  
Mathematically Minded, LLC, Orofino, Idaho
Lynn Rule  
Retired Teacher, Wheaton, Illinois

253 A (BCEC)
9:45 A.M.–11:00 A.M.

93
Math Matters: Using Games to Develop Number Sense
Pre-K–2 Gallery Workshop
Broaden your skill bank, and learn new math games to help your students develop a visual understanding of whole number operations, place value, number principles, and number sense. Participants in this interactive, hands-on workshop will become acquainted with games that will develop number concepts, quantitative analysis, and computational fluency.
John Hinton
Retired, Long Island University (C.W. Post), Brookville, New York

94
Strategies for Teaching Math Facts Rather Than Just Assessing Them
Pre-K–2 Gallery Workshop
Often we use timed tests and flash cards to “teach” math facts, a method that simply assesses and practices the facts that are known. So how do you teach math facts? Come learn several strategies for teaching your students math facts with manipulatives. We know that when students know their math facts fluently they are more successful at math in upper grades.
Kathleen A. Wilson
St. Paul Public Schools, St. Paul, Minnesota
Pam Palmer
Houghton Mifflin Harcourt, The Leadership and Learning Center, Englewood, Colorado

95
Meaningful Learning and Practice: Multiplication Fact Strategies That Build Fluency
3–5 Gallery Workshop
What does it mean for students to be fluent with multiplication facts? How can we help them meet the facts goals of CCSSM? Through analysis of student work and video of classroom teaching, participants will explore and discuss effective multiplication fact strategies and meaningful practice opportunities that help children work towards mastery.
Amanda Ruch
Center for Elementary Mathematics and Science Education, University of Chicago, Illinois
Gina Kling
Western Michigan University, Kalamazoo

96
Parent-Child Math Clubs: Engaging Families, Advancing Learning
3–5 Gallery Workshop
We will examine the research and principles of family engagement, and share the exciting model of Parent-Child Math Clubs developed by Boston Public Schools. This model advances students’ mathematical learning and confidence, coaches parents to support their children at home, and increases students’ understanding of the content and practice standards.
Connie S. Henry
Boston Public Schools, Massachusetts
Alice Levine
Boston Public Schools, Massachusetts

97
To Use or Not to Use? That Is the Question!
3–5 Gallery Workshop
Do calculators have a place in the elementary classroom? Of course they do! This session will assist teachers in rethinking how calculators might be used in grades 3–5 mathematics lessons. Every attendee will walk away with classroom-ready ideas that are student centered and inquiry based. Bring your technology and have "sum" fun!
Kay L. Neuse
Plano Independent School District, Texas
9:45 A.M.–11:00 A.M.

98  
Enacting Standards for Mathematical Practices through Tasks That Promote Understanding  
6–8 Gallery Workshop  
The Standards for Mathematical Practice are an essential component of the Common Core State Standards. Through engaging in mathematical tasks and problem-solving activities, educators will understand the important shifts in instruction to promote understanding, reasoning, and problem solving that they can then transfer to their own practice.
Robin L Henrikson  
Seattle Pacific University, Washington  
Tamara Smith  
Olympic Educational Service District 114, Bremerton, Washington

99  
Fair Shares or Equal Groups? Developing Conceptual Understanding of Division  
3–5 Gallery Workshop  
Participants will use a variety of manipulatives to model division, as we explore partitive and measurement meanings of the operation with whole numbers, and then extend these meanings to division of fractions and decimals. We will write and share contextual problems, and we will examine alternative algorithms and methods of representing remainders.
Mary Pat Sjostrom  
Winthrop University, Rock Hill, South Carolina

100  
Just a Piece of Paper: Linking Geometry, Measurement, and Fractions  
3–5 Gallery Workshop  
Discover how a one piece of paper with specific folds can be a vehicle for exploring topics of congruence, symmetry, polygon classification, and similarity. Make connections to measurement (area and perimeter) and use the activity to practice fraction topics, develop spatial visualization, and generate an interactive bulletin board.
Janice B. Koop  
Calvin College, Grand Rapids, Michigan

101  
Fostering Mathematical Success for All via Multiple Entry-Level Tasks  
6–8 Gallery Workshop  
Participants will experience and see how the use of multiple entry-level tasks can help all students achieve mathematical success. Selecting tasks, orchestrating discourse, and assessing student responses will be discussed along with other related pedagogical strategies.
Marilyn E. Strutchens  
Auburn University, Alabama

102  
Middle Years Math Games for Linear Equations and Mixed Operations  
6–8 Gallery Workshop  
Come prepared to play a variety of games that use cards and dice that focus on linear equations, operations, integers, and problem solving. The games are directly tied to CCSSM and are great for regular, title, DI, and after-school programs. I will show you how I increased computation skills by 17 percent in my middle school classroom.
Stephanie Garcia  
St. Louis Catholic School, Missouri

103  
Building Middle Grades Ratio, Proportion, and Proportional Reasoning Essential Understandings  
6–8 Gallery Workshop  
The presenters, authors of Putting Essential Understanding of Ratios, Proportions, and Proportional Reasoning into Practice in Grades 6–8, will engage teachers in tasks to help students make sense of these topics and develop strong proportional reasoning. Teachers will work collaboratively and reflect on ways to promote problem solving and meaningful learning.
Travis Olson  
University of Nevada, Las Vegas  
Melfried Olson  
University of Hawaii, Honolulu  
Hannah Slovin  
University of Hawaii, Honolulu
9:45 A.M.–11:00 A.M.

104 Fostering Mathematical Practices in English Learners
6–8 Gallery Workshop
The Common Core math practices raise the bar for all students, but the development of them can be particularly daunting for English language learners. This session addresses challenges and opportunities for ELLs inherent in the math practices, and it showcases instructional routines that develop mathematical thinking and academic language production.

Grace Kelemanik
Boston Plan for Excellence, Massachusetts

105 A-E-I-O-U (Algebraic Enriching Instructional Opportunities for U)
9–12 Gallery Workshop
This presentation will focus on various instructional activities to enhance student learning of algebra 1. Come learn different ways to teach quadratics, exponentials, systems, lines, and everything Common Core! Attendees will obtain a plethora of lessons, links, songs, and activities to use in their classroom.

Fred Thompson
East Forsyth High School, Kernersville, North Carolina
Gregory S. Fisher
Mount Tabor High School, Winston-Salem, North Carolina

106 Collecting, Analyzing, and Interpreting Data
6–8 Gallery Workshop
You will have the opportunity to participate in lessons on how to incorporate modeling into linear functions (bivariate data). Participants will have the chance to be a student working on collecting, analyzing, and interpreting data. The math labs will vary from measuring the circumference of a Tootsie Pop to using CBRs and calculators.

Kimberly Dawn Tarnowieckyi
Clover Park School District, Lakewood, Washington
Ray Kurtz
Clover Park School District, Lakewood, Washington

107 Learning Difficult Concepts in Algebra through iPad Apps
6–8 Gallery Workshop
iPad apps can do much more than provide students with practice. In this session we will learn about multiple free apps from the Center for Algebraic Thinking that help students develop understanding in algebra. The apps provide students with the opportunity to develop and test hypotheses and construct meaning with challenging algebraic topics.

Steve Rhine
Pacific University, Forest Grove, Oregon
Rachel Harrington
Western Oregon University, Monmouth, Oregon

108 Creating Mathematical Success for Students in Career and Technical Programs
9–12 Gallery Workshop
Mathematical problems that are encountered in career and technical classrooms allow teachers an opportunity to make math more relevant to students. Problems are put in a context that can motivate students and that address a variety of learning styles. Participants will have the opportunity to solve and design problems to use with their students.

Edith Kort
Genesee Valley Educational Partnership, Mt. Morris, New York

109 Integral Defined Functions: Discovering the Fundamental Theorem of Calculus with Technology
9–12 Gallery Workshop
Integral defined functions can serve as an introduction to the fundamental theorem of calculus. Paper-pencil and technology activities focus on connections between these functions and the derivative function. Hands-on investigations designed to help students improve their conceptual understanding of the FTC and AP problems involving FTC.

Mike Koehler
Blue Valley North High School, Overland Park, Kansas
9:45 A.M.–11:00 A.M.

110
Math and Fine Arts: Incorporating Dance and Other Fine Arts
9–12 Gallery Workshop
Black and white math takes on some color. Use contra dancing to get students out of their seats and learning to create composite transformations. Especially good for kinesthetic learners, students can learn to write, analyze, and perform a real dance built on math. Students can also analyze music and create 2-D art.

Esther D. McKay
RSU 13 Oceanside High School, Rockland, Maine

212 (BCEC)

111
Using Algebra Tiles from Polynomials to Factoring
9–12 Gallery Workshop
Participants will be actively engaged in using algebra tiles to show operations on polynomials, algebraic multiplication, factoring, and completing the square. While using the tiles, teachers will learn how to help students transition from the concrete (manipulative) to the abstract (paper and pencil).

Sherri D. Billings
School Administrative Unit 9, North Conway, New Hampshire

258 C (BCEC)

112
Effective Teaching Practices in Integrating Technology to Address Student Misconceptions
9–12 Gallery Workshop
Energize your classroom and explore effective practices in engaging students with various interests in rich mathematical tasks. Take part in a workshop where technology (iPads, tablets, etc.) will be seamlessly and purposefully integrated in identifying and addressing student misconceptions that are prevalent in algebra and precalculus.

Farshid Safi
The College of New Jersey, Ewing
George J. Roy
University of South Carolina, Columbia

GRAND BALLROOM C (WESTIN)

113.1 SL
The Focus on Mathematics Academy
9–12 Gallery Workshop
Teachers from the Focus on Mathematics community will present sample activities for students and teachers designed to promote mathematical habits of mind. Participants will engage personally in activities that encourage mathematical experimentation and observation, as well as good use of language to articulate, refine, and justify conjectures.

Glenn Stevens
Boston University, Brookline, Massachusetts
Tracia Fung
Brockton High School, Massachusetts
Shannon Hammond
University Park Campus School, Worcester, Massachusetts

157 B/C (BCEC)

113
Mathematical and Scientific Thinking: A Must for STEM Success
Preservice and In-Service Gallery Workshop
Engage in integrated math and science activities that develop critical thinking skills while applying concepts of number sense, ratios and proportions, and scientific notation with science topics of earthquakes, landforms, and earth/moon/sun relationships. Participants will discuss ways to build constructive thinking in math and science.

Clemmie B. Whatley
Mercer University, Atlanta, Georgia
Jane M. Metty
Mercer University, McDonough, Georgia

156 A/B (BCEC)

114
They Built a City
Preservice and In-Service Gallery Workshop
Base-ten understanding is essential to children’s conceptual understanding of place value. Opportunities to construct numbers in bases other than ten help students develop a conceptual understanding of place value to support their procedural fluency with regrouping. Come see how one school “built a city” to demonstrate bases other than ten.

Hope E. Phillips
Columbus State University, Georgia
Denise S. Peppers
Columbus Regional Mathematics Collaborative, Columbus State University, Georgia

162 A/B (BCEC)
110 A.M.–12:00 P.M.

115 Activating Students’ Intrinsic Motivation to Master Mathematics
General Interest Session
NCTM’s *Principles to Actions* calls for students to take a much more active role in learning math. This dynamic and inspirational session will illuminate what education research, science, psychology, and business has uncovered about the factors that impact intrinsic motivation. These factors are independent of culture, socioeconomic status, and race.

Michael Grote
Buckeye Community Hope Foundation, Columbus, Ohio
GRAND BALLROOM A (WESTIN)

116 ALL Students Can Practice Common Core Standards for Mathematical Practice
General Interest Session
President’s Series presentation
This online program supports teachers to be proficient in the SMPs through engaging discussions, videos, and problems. Included are grade level examples and strategies for English language learners. Come and engage in the SMPs and focus on supporting students to develop the habits of mind necessary to become proficient as mathematical thinkers.

Susie W. Hakansson
TODOS: Mathematics for ALL, Venice, California
BALLROOM WEST (BCEC)

117 Developing Fractional Reasoning through Number Talks
General Interest Session
The routine of Number Talks to support the development of fractional reasoning and computational fluency will be explored through the lens of the NCTM’s Mathematics Teaching Practices and the Common Core’s Standards for Mathematical Practice. Classroom video of fraction Number Talks will be used to discuss and analyze student fractional reasoning.

Sherry D. Parrish
University of Alabama at Birmingham
Ann M. Dominick
University of Alabama at Birmingham
BALLROOM EAST (BCEC)

118 Developing Math Ed Leaders—Join Us and Become One!
General Interest Session
As we work to make mathematics accessible and engaging for all students, we need to grow mathematics education leaders who will lead us to better address student needs and grow teachers. Come and participate in activities that identify leadership skills found in *Principles to Actions*. Use them to help your affiliate.

NCTM Affiliate Services Committee
National Council of Teachers of Mathematics, Reston, Virginia
106 (BCEC)

119 Supporting and Learning from Your Students’ Reasoning and Sense Making
General Interest Session
This session presents teacher moves and instructional tasks that support students as they build personal mathematical knowledge, structures, facts, relations, and practices. Also, we will share strategies for you to assess your students’ concept development and misconceptions that can inform your instructional decisions.

Henry S. Kepner
Past President, National Council of Teachers of Mathematics; University of Wisconsin–Milwaukee
211 (BCEC)

120 Impact and Implications of Math Discourse Interventions in Preschools
Research Session
Our presentation provides empirical support for preschool interventions promoting math conversations in play. In our study, experienced teachers who used math conversations during play significantly impacted number and geometry interactions. Also, preschool teachers increased their levels of math talk after only brief meetings with a researcher.

Sudha Swaminathan
Eastern Connecticut State University, Willimantic
Jeffrey Trawick-Smith
Eastern Connecticut State University, Willimantic
255 (BCEC)
11:00 A.M.–12:00 P.M.

121 PBS KIDS Ready-to-Learn Resources for Early Math Learning
Pre-K–2 Session
Learn how free resources from the U.S. Department of Education–funded Ready to Learn program can support the development of math skills in early learners. Experience Common Core–aligned resources that reinforce learning in school, at home, and in expanded learning settings. Hear the latest research on transmedia and early math skill development.

David Lowenstein
PBS, Arlington, Virginia
Pamela Johnson
Corporation for Public Broadcasting, Washington, D.C.
Francis (Skip) Fennell
Past President, National Council of Teachers of Mathematics; McDaniel College, Westminster, Maryland

122 Changing the Rules to Increase Discourse
Pre-K–2 Session
Come to this session to learn how to help your students engage in meaningful mathematics discussions. We will explore what happened when a second-grade teacher allowed his students to speak without first raising their hands during whole group instruction. Spoiler alert: The results were amazing! Video examples and practical advice will be shared.

Lisa Ann Brooks
University of Central Florida, Orlando

123 Problems Worth Puzzling Through: High Engagement, Content, and Mathematical Practices
3–5 Session
Puzzles build mathematical practice: stamina/perseverance; seeking/using entry points and structure; and logical argument. Well chosen, they’re also great carriers of content. Problems worth solving are often puzzle-like even if not literally “puzzles.” Get some. Build some. See how students can build their own, sharpening skills and solid thinking.

Paul Goldenberg
Education Development Center, Waltham, Massachusetts
Cindy Carter
The Rashi School, Dedham, Massachusetts

124 Tasks That Support Problem Solving, Reasoning, and CCSS Mathematical Practices
3–5 Session
NCTM’s Principles to Actions describes aspects of higher-level demand tasks. The CCSS Mathematical Practices, PARCC, and Smarter Balance also describe higher-level aspects of classroom interactions and test items. This presentation will analyze and relate these various aspects, and participants will discuss tasks that exemplify these.

Karen C. Fuson
Northwestern University, Evanston, Illinois

125 Got Division?
3–5 Session
We will look closely at division in grades 3–5 and provide clarity and resources to support teaching whole number division using strategies based on place value, properties of operations, and the relationship between division and multiplication. We will also explore rectangular arrays and area models as they relate to division computation.

Heather Dyer
Howard County Public Schools, Ellicott City, Maryland
Kelly Krownapple
Howard County Public Schools, Ellicott City, Maryland
Claudia Eckstrom
Howard County Public Schools, Ellicott City, Maryland
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April 16, Thursday 2 pm, Convention Center Room 153B
&
April 17, Friday 2 pm, Convention Center Room 153B

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11:00 A.M.–12:00 P.M.

126  
Strip Models, Tape Diagrams, and Bar Models, Oh My!  
3–5 Session  
These visual components sit at the intersection of Common Core, Singapore Math, and now technology! Learn why this visual model for word problems is so powerful, try some problems from the simple to the complex, and investigate web-based programs and iPad apps that will help anyone incorporate this effective strategy into their classrooms.  
Cassandra Turner  
Cassandra Turner & Assoc., Fort Collins, Colorado  
Lauri Susi  
Conceptua Math, LLC, Petaluma, California

128  
Early Algebra: It’s FUNdamental  
3–5 Session  
Helping children develop conceptual understandings of early algebra is fundamental and FUN. In this session we will explain why early algebra is important and engage participants in practical, fun classroom activities that illustrate the nature of early algebra. We will illustrate how to integrate algebra readiness into the current curriculum.  
David Feikes  
Purdue University North Central, Westville, Indiana  
Martin Briggs  
La Porte Community School Corporation, Indiana  
Mike Maesch  
Michigan City Area Schools, Indiana

129  
All Students Should “Talk to Learn” Proportionality and Academic Language  
6–8 Session  
Students, including English language learners, benefit from lessons that are designed to develop concepts, vocabulary, and problem solving through structured student talk and collaboration focused on important, yet challenging and potentially confusing mathematics concepts and tasks. Explore a sequence of lessons that develop proportional thinking.  
Debra Coggins  
Debra Coggins & Assocs., Lafayette, California

130  
Financial Literacy: Establishing a Classroom Economic System  
6–8 Session  
Students participate in a classroom economy in order to simulate real-world economic activity. Students apply for classroom jobs, run businesses, pay taxes, buy rental properties, and make investments. Cross curricular connections are made with English, human geography, and science.  
Cécile M. Kuntz  
Ottawa Catholic School Board, Canada

131  
High Impact Techniques for Asperger’s in the Classroom  
6–8 Session  
Finding high impact math classroom techniques that enable Asperger’s students to succeed with little additional teacher preparation time required is difficult. We will discuss specific techniques, gleaned from teacher interviews, and the targeted manifestations that each addresses, from choosing and executing strategies to explaining and showing work.  
Debbie Gochenaur  
Shippensburg University, Pennsylvania  
Andrew Geesaman  
Greencastle-Antrim Middle School, Pennsylvania

132  
Keepin’ It Real: Contextualizing Mathematics  
6–8 Session  
Gone are the days of lengthy and irrelevant word problems! Help your students learn to think critically and develop a common core of knowledge necessary for success in the future. Receive easy-to-follow guidelines and rubrics that will prepare you to indulge your students’ needs to apply mathematics outside of the classroom.  
Jennifer G. Martin  
St. Ambrose Catholic School: A University of Notre Dame ACE Academy, Tucson, Arizona
11:00 A.M.–12:00 P.M.

133  
Proportional Reasoning through Strip Diagrams  
6–8 Session
Strip diagrams are powerful visual models that can be applied to a variety of contexts, including fractions, proportions, and algebraic reasoning. In this session, we will focus on using strip diagrams to solve complex proportional reasoning tasks, make sense of the cross product algorithm, and connect fraction division to proportional reasoning.

Jessica S. Cohen  
Western Washington University, Bellingham

134  
Generalizing: The Core of Algebraic Thinking  
6–8 Session
Generalizing—all with conjecturing, representing, justifying, and refuting—are forms of mathematical reasoning important in all branches of mathematics. Increasingly, however, generalizing is recognized as the core of algebraic thinking and the overall mindset for introductory algebra. Explore generalization tasks for meaningful symbol use.

Barbara M. Kinach  
Arizona State University, Tempe

135  
Adaptation: Creating Open Problems from Closed Curricula  
9–12 Session
As a teacher transitions to a problem-based classroom, developing new problems from scratch can be overwhelming, while canned curricula and problem sets can be misaligned to students’ needs. In this session, we’ll practice means of taking preexisting rote problems and adapting them to spark student curiosity and allow for multiple solution paths.

Geoff Krall  
New Tech Network, Napa, California

136  
Intellectually Engaging Problems: The Heart of a Good Lesson  
6–8 Session
A common characteristic of good lessons worldwide is that students are intellectually engaged in solving and reasoning through rich mathematical problems. I will share several problems that I have seen during observations in Japan and have subsequently used in the U.S. I will also discuss some features I have found common among these rich problems.

Blake E. Peterson  
Brigham Young University, Provo, Utah

137  
Kinesthetic Strategies for Mastering the Unit Circle  
9–12 Session
Learn kinesthetic strategies for helping students to quickly learn the sin, cos, tan, cot, csc, and sec of common angles and to understand the relationship between degrees and radians. Learn how the unit circle patterns can facilitate learning co-terminal angles, trig functions, and signs of trig functions in different quadrants.

Suzy Koontz  
Actuarial Consulting and Teaching Services, Inc., Ithaca, New York

138  
Making Mistakes in Math Class: Building a Culture of Learning  
9–12 Session
Teachers are always looking for the “right” answers from students, often ignoring opportunities to generate learning from “wrong” answers. This presentation describes methods of building a culture of learning where students feel safe to share ideas, work, and questions inside the classroom.

Donna Ivanisevic  
George Westinghouse College Prep, Chicago Public Schools, Illinois  
Hannah Schuchhardt  
George Westinghouse College Prep, Chicago Public Schools, Illinois
11:00 A.M.–12:00 P.M.

139 Million Dollar Mathematics of Game Shows
9–12 Session
Where do those bank offers come from in Deal or No Deal? What’s the chance of spinning bankrupt on Wheel of Fortune? Game show questions lead to topics in probability, statistics, and game theory. We’ll examine game shows from the dual perspectives of players and designers. Audience members will win prizes whether they want them or not!
Bowen Kerins
Education Development Center, Inc., Waltham, Massachusetts

140 Rigor, Relevance, and Relationships: Building PBL Culture in Your Classroom
9–12 Session
Learn the basics of PBL and its essential components of rigor, relevance, and relationships. PBL can be a way for students to learn rigorous mathematics while engaged in authentic, relevant challenges. We share design ideas and resources to support teachers in creating their own projects, and building and sustaining a PBL culture in the classroom.
Enrique Galindo
Indiana University, Bloomington
Jean Lee
University of Indianapolis, Indiana

141 The Standards for Mathematical Practice of CCSSM in Assessment
9–12 Session
How can the Standards for Mathematical Practice of CCSSM be addressed within a standardized testing environment? How can innovative question types encourage reasoning, problem solving, and the recognition of structure? How can assessments help teachers build students' mathematical proficiency? Come hear the answers to these questions and more.
Robin K. O’Callaghan
Educational Testing Service, Princeton, New Jersey
Daniel Klag
Educational Testing Service, Princeton, New Jersey

142 Mathematical Quality with a Deliberate Focus on Equity and Diversity
Preservice and In-Service Session
We will share results from our research project about how preservice teachers are attending to equitable math teaching. We will present a framework comprised of indicators of equitable mathematics instruction, and we will share specific strategies and sample lessons that will enable teachers to facilitate equitable teaching in their own classrooms.
Imani Goffney
University of Houston, Texas
Monica Gonzalez
University of Houston, Texas

143 Developing an Integrated Secondary Methods and Field Experience
Preservice and In-Service Session
Developing a secondary methods course and integrated field experience is challenging. We will share our experience in taking on this challenge: what we are doing, how this has changed our methods course and field experience, what we’ve learned, and the benefits and continuing challenges of integrating these important components of teacher preparation.
Michele Iiams
University of North Dakota, Grand Forks

210 B (BCEC)
207 A (BCEC)
161 (BCEC)
COMMONWEALTH C (WESTIN)
GRAND BALLROOM D (WESTIN)
11:00 A.M.–12:00 P.M.

144
Preservice Teachers’ Understandings of Division and Proportional Relationships with Quantities
Research Session

The purpose of this study was to investigate how preservice teachers’ understandings of multiplication and division support and constrain their understandings of ratios and proportional relationships in terms of quantities. An explanatory case study with multiple cases was used to make comparisons within and across cases.

Ibrahim Burak Olmez
University of Georgia, Athens

144.1
Unleash the Power of Games-Based Math with Mangahigh.com
General Interest Exhibitor Workshop

Mangahigh has revolutionized the way we engage students in our math classrooms. With interactive games and clever adaptive quizzes, all mapped to the curriculum for K–10, Mangahigh brings dramatic improvements in students’ attitudes towards learning math. Attend to claim your free 60-day trial of www.mangahigh.com!

Mangahigh.com
London, England, United Kingdom

144.2
Using Technology to Reason Mathematically
General Interest Exhibitor Workshop

Principles to Actions focuses on how teachers can create effective learning environments for all students. We will address the Mathematics Teaching Practices through the use of coherent activities and investigations with TI technology. Learn how to integrate technology into your lessons to help students make stronger connections in mathematics.

Texas Instruments
Dallas, Texas

144.3
A Look at enVisionmath2.0 from a Teacher and Author Perspective
Pre-K–5 Exhibitor Workshop

Learn how key issues like content organization, problem-based learning, visual learning, rigor, and assessment impacted the development of the new enVisionmath2.0 program, and see how it supports student learning.

Pearson
Upper Saddle River, New Jersey

144.4
Using Technology to Transform Singapore Math in Your Classroom!
Pre-K–8 Exhibitor Workshop

Join us to learn about Math in Focus Digi+. This teaching and learning tool will transform your class: facilitating class instruction, activities, intervention and differentiation solutions, and deepening the school-to-home connections with practice problems, immediate feedback, and parental support in a fun, interactive environment.

Houghton Mifflin Harcourt
Boston, Massachusetts

144.5
Woot Math: Transform your students’ understanding of fractions!
3–5 Exhibitor Workshop

Are blank stares all too familiar when you teach fractions? Grab those iPads, Chromebooks, and laptops, and start using Woot Math today for free. Woot Math’s adaptive solution is research backed, NSF supported, and proven to address the gaps in your students’ understanding. Come and see if our award-winning solution doesn’t make you Woot! out loud.

Woot Math
Boulder, Colorado
11:00 A.M.–12:00 P.M.

144.6  
Practice the Practices: 
Amplify Math Projects

6–8 Exhibitor Workshop

Prepare middle schools students for CCSS-based, high-stakes tests, and introduce project-based learning (PBL) into your classroom with Amplify Math Projects’ engaging multiday projects. In this session, participants will gain tools and resources for supporting common pitfalls to PBL in a math class through Amplify Math Projects’ web-based teacher app.

Amplify
Brooklyn, New York

152 (BCEC)

11:30 A.M.–12:00 P.M.

145
Do-It-Yourself: Making PD Effective

General Interest / All Audiences Burst

How effective is the professional development at your school? In the age of the Internet, there is no reason that PD should be a waste of time. Come learn how you can support the development of your teaching practice as well your colleagues’ practices through blog-studies and connecting with like-minded teachers. New teachers especially welcome.

LeeAnn Allen
Gestalt Community Schools, Memphis, Tennessee

COMMONWEALTH A-B (WESTIN)

146
Establishing an NCTM Student Affiliate

General Interest / All Audiences Burst

Join the team from the Nebraska Association of Teachers of Mathematics as we lead you through our first year of establishing an NCTM Student Affiliate. We will share our timeline, planning process, and first-year results. Our goal was to establish relationships with preservice teachers to show them the benefits of membership in our organization.

Marci Ostmeyer
Nebraska Association of Teachers of Mathematics, Lincoln

109 A/B (BCEC)

147
Learning-Style Preferences of 
Struggling Math Students

Higher Education Burst

Research was conducted on learning-style preferences of college freshman who have struggled in math. The goal was to discover patterns of strong preferences amongst these learners. Understanding these patterns may help teachers to employ strategies to promote the development of critical thinking and problem solving among struggling math students.

Kathy Turrisi
Centenary College, Hackettstown, New Jersey

Linda Ritchie
Centenary College, Hackettstown, New Jersey

212 (BCEC)

148
Math in Motion: Moving for 
Understanding and Fluency

General Interest / All Audiences Burst

Experience PowerPoint presentations 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 PowerPoints. Leave with ideas to get your students moving and learning.

Sue McMillen
SUNY Buffalo State, New York

206 A/B (BCEC)

149
Online Teaching and Learning 
Communities

9–12 Burst

Long-distance online classes give students the opportunity to take courses that are not offered in their schools. We will share our online high school linear algebra teaching experience.

Elena Kazorowski
Education Development Center, Boston, Massachusetts

Elaine Sigal
Mindlaunch, Los Altos, California

258 B (BCEC)
11:30 A.M.–12:00 P.M.

150 Using Comics for Assessment
General Interest / All Audiences Burst

This session will describe a summative assessment in which middle school students create a comic strip. A rubric was used to evaluate the students’ depth of mathematical understanding displayed in the comic. The presenters will share the assignment, rubric, student work samples, and the effect of cartoons on students’ attitude toward mathematics.

Katie A. Hendrickson
Athens City Schools, Ohio
Hoyun Cho
Capital University, Columbus, Ohio

GRAND BALLROOM E (WESTIN)

151 Compatible Pairs: Extending the Part-Part-Whole Relationship
Pre-K–2 Burst

This session will demonstrate the use of landmark numbers in the primary grades through tasks adapted from the book series Teaching Student-Centered Mathematics by John Van de Walle. A progression will be explored as number relationships are developed. The activities will include number relationships from 5 to 1000.

Julie K. Dill
Wicomico County Board of Education, Salisbury, Maryland

205 C (BCEC)

152 Fractions at an Early Age
Pre-K–2 Burst

In this session, I will share how I used prior knowledge, relevance, and an understanding of a fractional amount as a quantity that can be counted to successfully help all of my learners achieve a deep understanding of fractional parts.

Karen Capraro
Rhode Island College, Providence

257 A/B (BCEC)

153 Number Gym Early Intervention Project
Pre-K–2 Burst

Learn how a physical education teacher and a math tiered teacher are working together to design and deliver an early intervention program involving movement-based activities and games to develop number sense and early numeracy skills. The process used to identify students and collect data, as well as many of the games and activities, will be shared.

Dan Caffrey
Bedford Central School District, Mount Kisco, New York
Patrick Aris
Bedford Central School District, Mount Kisco, New York

256 (BCEC)

154 Young Mathematicians: Providing Instruction for Talented Students in K–2
Pre-K–2 Burst

This presentation will describe characteristics of talented math students in the primary grades and explore how to differentiate instruction. Math tasks that focus on four key areas—enrichment, acceleration, novelty and sophistication—will be shared. The challenges faced by teachers will be delineated along with strategies for overcoming them.

Dianne S. McCarthy
Buffalo State: The State University of New York

104 A/B (BCEC)

155 Fostering Mathematical Perseverance: Lessons from Research and Practice
3–5 Burst

Do you have students who become frustrated or give up when faced with a challenging math problem? Drawing on research and examples from elementary classrooms, this session will share what teachers can do to increase students’ appetite, stamina, and strategies for persevering through productive struggle in mathematics.

Wendy S. Bray
University of Central Florida, Orlando

252 A (BCEC)
11:30 A.M.–12:00 P.M.

156 Mathematics Concept Maps: Ensuring Mathematical Success for All
Preservice and In-Service Burst
A concept map refers to a graphic representation of concepts with linking connections. It is an inquiry technique that provides learners with an opportunity to demonstrate content retention. Learners clarify mathematical misconceptions and strengthen content connections while participating in creative hands-on/minds-on learning challenges.

Nancy L. Gallenstein
University of South Carolina Upstate, Spartanburg

156 (BCEC)

157 Putting the Heat and Thunder to Work for You
3–5 Burst
If you teach elementary school, you’ve encountered students who are obsessed with basketball. Luckily for us, basketball is a highly mathematical sport with a wealth of built-in connections involving operations, algebraic thinking, data, probability, and even geometry. Dribble on over and take your best shot at linking sports and math!

Stephen Currie
Poughkeepsie Day School, New York

157 (BCEC)

158 Learning to Teach Fractions from Students and from Research
3–5 Burst
What does it take to learn to teach fractions? A fourth-year teacher and a 30-plus-year mathematics educator will reflect together on a new teacher’s learning about students’ challenges through assessment and from research to help fourth graders understand equivalent fractions, addition and subtraction of mixed numbers, and other fraction concepts.

Beth Mundy
Northwest Elementary School, Leominster, Massachusetts
Joan Ferrini-Mundy
Mathematics Educator, Chantilly, Virginia

158 (BCEC)

6–8 Burst
How can using proportional relationships and equivalent ratios help divide fractions? Can teachers really get away without saying “keep, change, flip”? Participants will learn how to teach students fraction division while refining their numeracy skills furthering the development of their understanding of proportional relationships and number sense.

Johnette Monaghan
McKinney Independent School District, Texas

159 (BCEC)

160 “We Must Stop Sorting Students”: One Teacher’s Experience with Detracking
6–8 Burst
Hear about one teacher’s efforts to detrack mathematics courses at his urban middle school over a two-year period, both the challenges and the successes. Learn about the research base that supported this effort, the changes to instructional practice that accompanied the shift, and the outcomes for students that were realized.

Mark Ellis
California State University, Fullerton
David Rhodes
Santa Ana Unified School District, California

160 (BCEC)

161 Mathematical Modeling: A Model Approach to Keep Students Engaged
6–8 Burst
Participants will learn more about mathematical modeling, how to structure modeling activities to maximize student engagement, receive access to example modeling activities, and learn how modeling activities can connect to all eight Standards for Mathematical Practice.

Micah Stohlmann
University of Nevada, Las Vegas
Cathrine Maiorca
University of Nevada, Las Vegas

161 (BCEC)
11:30 A.M.–12:00 P.M.

162  
**Math Practices for All: Differentiated Instruction Using Universal Design Principles**  
9–12 Burst  
How can teachers provide access to the Standards for Mathematical Practice? Differentiated assessments, developed using research-based Universal Design for Learning principles, are described. Strategies to increase access and engagement for students with and without disabilities on key Common Core math practice and content standards are emphasized.

*Jason C. Colombino*  
BetterLesson Master Teacher Project, Cambridge, Massachusetts  

163  
**Shifting Focus from What You Say to What You Hear**  
Research Burst  
The presentation will illustrate in-class mathematical dialogs occurred in six middle school mathematics teachers' class. We will address teachers' responses to the mathematical ideas and questions raised by students during the teaching of slope. A comparison of teachers' reactions to student ideas and using those ideas as an opportunity will be the focus.

*Oguz Koklu*  
University of Georgia, Athens  
*Fatma Aslan-Tutak*  
Bogazici University, Istanbul, Turkey  

164  
**The Challenges and Rewards of Standards-Based Grading**  
9–12 Burst  
Implementing a standards-based grading system within a school culture based on points accumulation presents significant challenges. Yet, there are a variety of rewards for making it happen. In this presentation, we discuss our own successes and failures when we committed to putting SBG into practice.

*Matthew Grinwis*  
Downingtown Area School District, Pennsylvania  
*Michael Manganello*  
Downingtown Area School District, Pennsylvania  

165  
**Architecture in Geometry**  
9–12 Burst  
By connecting geometric concepts to real-world photos, videos, and technology, teachers can engage students and create meaningful and lasting learning experiences. I will present a variety of means by which teachers can incorporate architecture from around the world to create lessons that are exciting, multicultural, and student relevant.

*Robin M. Mankel*  
Boston Public Schools, Massachusetts  

166  
**Customizing Collaborative Professional Learning in an Urban Setting**  
Research Burst  
This presentation provides results of the FRAME project, a customized professional development program for a low-income, minority-dominant comprehensive high school in south-central Los Angeles through the support of the UCLA Math Project at Center X, part of the California Mathematics Project, a K–16 professional development network.

*Kyndall Brown*  
California Mathematics Project, Los Angeles, California  
*Patricia O'Driscoll*  
Public Works, Pasadena, California  

167  
**Mathematical Discourse: What Are Preservice Teachers Telling Us?**  
Research Burst  
We briefly report findings from a qualitative study of preservice teachers' understandings of mathematical discourse. We present varied perspectives based on their coursework and field experiences. Findings of the study will be discussed to identify implications for preservice mathematics education courses.

*Jeremy M. Lynch*  
Slippery Rock University, Pennsylvania  
*Sararose D. Lynch*  
Westminster College, New Wilmington, Pennsylvania
11:30 A.M.–12:00 P.M.

168  
**To Flip or Not to Flip?**
*Higher Education Burst*

In a flipped classroom, students are given online instruction prior to class, replacing the traditional lecture that monopolizes class time, leaving little time for working problems. Presented are the achievement, attendance, and student evaluation comparisons between a college instructor's courses—flipped model vs. a traditional class setting.

_Tonya S. Adkins_
Johnson & Wales University, Charlotte, North Carolina

102 A/B (BCEC)

169  
**Department Model for Secondary Student Teaching: Cooperation, Collaboration, Co-Teaching**
*Preservice and In-Service Burst*

The induction model of placing each preservice teacher candidate with a single cooperating teacher relies to heavily on one relationship and one person’s classroom practice. The most successful teachers decline mentorship because they do not want to give up their classes. We are using a department model for student teaching with powerful results.

_Kasi C. Allen_
Lewis & Clark College, Portland, Oregon

_Kemble Schnell_
Inza Wood Middle School, Wilsonville, Oregon

205 A (BCEC)

12:30 P.M.–1:30 P.M.

171  
**Developing Risk Takers: Teaching Students to Give It a Go**
*General Interest Session*

Risk taking is an essential disposition of mathematicians, and a key component of a growth mindset. Students must leave their comfort zones to make conjectures, embrace challenges, persevere, and learn from mistakes. We’ll share several effective instructional strategies for creating safe learning communities and teaching mathematical courage!

_Tracy Johnston Zager_
Stenhouse Publishers, Portland, Maine

_Heidi Fessenden_
Boston Public Schools, Massachusetts

_Ann Gaffney_
Londonderry Middle School, New Hampshire

253 B (BCEC)

172  
**Improve Your Tests, Lessons, and Student Learning with Rigorous Rubrics**
*General Interest Session*

Students often care more about grades and less about understanding mathematics because percent-based grading systems distract from key outcomes. Learn how teachers collaborated to turn standards into Novice-Expert rubrics that improved tests, lessons, and student performance. Hear how rubrics transform curriculum, grading, and rigor at any grade level.

_Tim Hudson_
DreamBox Learning, Bellevue, Washington

GRAND BALLROOM A (WESTIN)

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173  CC
Mathematical Habits of Mind: Practices, Processes, and More

General Interest Session

For more than two decades NCTM, the National Research Council, and now the Common Core have called for students to learn mathematical processes, proficiency, and practices. What mathematical habits of instruction can help all students develop these powerful mathematical habits of mind—thinking, reasoning, sense making, and problem solving?

Cathy L. Seeley
Past President, National Council of Teachers of Mathematics; Senior Fellow (Emeritus), Charles A. Dana Center, University of Texas, Austin

BALLROOM WEST (BCEC)

174
Multimedia Formative Assessment and the Standards for Mathematical Practice

General Interest Session

We share multimedia items that are designed to assess student proficiency with the Standards for Mathematical Practice (SMP). The items provide occasions for students to comment on and offer alternatives to example work on tasks that target specific SMPs. We will consider how such items could be used for formative assessment of SMP aptitude.

Justin K. Dimmel
University of Michigan, Ann Arbor
Patricio G. Herbst
University of Michigan, Ann Arbor

210 B (BCEC)

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12:30 P.M.–1:30 P.M.

175
Thoughtless Excellence: When Students Succeed without Thinking
General Interest Session
Success in mathematics is often measured by grades. Yet, some students receive high grades without really understanding the mathematics. This session will highlight several key teaching practices that encourage deep conceptual understanding as well as some practices that unintentionally support students’ “thoughtless excellence.”

Jason Libberton
Idaho State University, Pocatello
Angie Godfrey
Idaho Regional Mathematics Center, Idaho State University, Pocatello
Rhonda D. Birnie
Idaho State University, Pocatello
COMMONWEALTH C (WESTIN)

176
Implementing Math Standards through Art Opportunities
Pre-K–2 Session
Art can be a math-rich experience that supports mathematical thinking in all of the domains. Opportunities that require appropriate geometric and positional language, counting, operations, and problem solving abound. Be prepared to create art while thinking and doing math! Masterpieces from well-known artists and young children will be shown.

Vicki C. Milstein
Brookline Public Schools, Massachusetts
Joan D Martin
Newton Public Schools, Massachusetts
Min-Jen Taylor
Public Schools of Brookline, Chestnut Hill, Massachusetts
GRAND BALLROOM D (WESTIN)

177
Using Language to Develop Addition and Subtraction Concepts
Pre-K–2 Session
Success with problem solving begins with a deep understanding of concepts such as addition and subtraction across a range of situations. The situations change depending on the language in the problems. This session will demonstrate how a language approach can be used to develop a breadth of understanding for addition and subtraction.

Rosemary R. Irons
Early Childhood Mathematics Consultant, Brisbane, Australia
159 (BCEC)

178
Desirable Difficulties: Is Easier Always Better?
3–5 Session
What kinds of difficulties are desirable? Can taking a test be a learning experience? Is spacing or massing practice better? Should teachers “be less helpful”? We describe research about desirable difficulties—learning experiences that are difficult but that result in increased learning—and how to implement them in your classroom.

Andy Isaacs
University of Chicago, Illinois
Deborah A Leslie
University of Chicago, Illinois
GRAND BALLROOM D (WESTIN)

179
Differentiation: It’s More Than Just Changing the Numbers
Pre-K–2 Session
This session focuses on strategies for differentiating classroom activities to meet the needs of all learners. Participants will be introduced to a structure for thinking about differentiation and a set of strategies they can use to adjust the teaching and learning environment to offer access to struggling students or to extend student thinking.

Karen Economopoulos
TERC, Cambridge, Massachusetts
107 A (BCEC)
12:30 P.M.–1:30 P.M.

180

Effective Classroom Teaching for Developing Numerical Understanding and Skills
3–5 Session

Developing students’ numerical competence is the cornerstone of elementary math instruction. This session connects classroom practice to the Common Core recommendation for a “balanced combination of procedures and understanding” and the Common Core caution that “students who lack understanding of a topic may rely on procedures too heavily.”

Marilyn Burns
Math Solutions, Sausalito, California

BALLROOM EAST (BCEC)

181

Making Things Write: How to Infuse Quality Math Writing
3–5 Session

The Common Core calls for students to communicate their reasoning. Did you know they are expected to do so in writing? Come learn about writing connections between the math and English language arts standards, assessment expectations, and ways to construct quality prompts. We will share research results and strategies that you can implement in your own classroom!

Tutita M. Casa
University of Connecticut, Storrs
Madelyn M. Williams
University of Connecticut, Storrs

207 (BCEC)

182

Mental Math Means Mastering Number Facts and Much More
3–5 Session

Mental math is a goal of computation. First, students need to be fluent with number facts and then with examples beyond facts that are mentally manageable. This session will demonstrate how to achieve that goal, with special strategies to master basic number facts for all operations. These are extended beyond the facts to special and general strategies.

Calvin James Irons
Mathematics Education Consultant, Brisbane, Australia

153 C (BCEC)

183

State, District, Coach, and Teacher Perspectives on Common Core Implementation
3–5 Session

Results from interviews and surveys of state department of education officials, intermediate school district mathematics personnel, math coaches, and elementary teachers concerning their views of the Common Core State Standards and their implementation in Michigan will be discussed. Areas of agreement and disagreement will be highlighted.

Dan L. Clark
Michigan State University, East Lansing

103 (BCEC)

184

Getting Students to Pose Powerful Questions to Stimulate Their Thinking
6–8 Session

This session will share research and classroom examples on the value of having students learn to pose questions to stimulate their thinking of mathematics based on a study in several middle schools. Participants will leave with strategies for their classrooms that are designed to increase their students’ ability to pose powerful questions.

Jane M. Wilburne
Penn State Harrisburg, Middletown, Pennsylvania

259 A (BCEC)

185

Adapting Problems to Meet the Rigor of CCSSM
6–8 Session

To meet the rigor of the CCSS, classroom instruction should build conceptual understanding, increase procedural skill and fluency, and provide application of skills in real-world situations. This session will use Bloom’s Taxonomy and Webb’s Depth of Knowledge to adapt existing math problems to a higher levels of rigor and complexity.

Emily Freeland
Mountain Brook City Schools, Mountain Brook, Alabama
Chris Weber
The Leadership and Learning Center, Englewood, Colorado

106 (BCEC)
12:30 P.M.–1:30 P.M.

186  
**Middle School Number Talks: Mathematical Sense Making through Mental Math**  
6–8 Session  

Middle school Number Talks provide a powerful mental math classroom routine that supports the continued development of our middle students’ number sense and encourages productive academic discourse. In this session we will engage in intermediate Number Talks and address how to integrate this rigorous protocol into middle school math teaching practice.  

Sheila Yates  
Math Solutions, Sausalito, California  
Kristi Cohen  
Math Solutions, Sausalito, California  
Renee Everling  
Math Solutions, Sausalito, California

187  
**Motivating Our Students with Real World Problem-Based Lessons**  
6–8 Session  

When our students are trying to find answers to problems they care about, they become far more motivated to learn. We will explore several such problems with a focus on classroom implementation and links to the Common Core mathematical practices. Participants will leave with access to over 100 free problems available on the Internet.  

Robert B. Kaplinsky  
Downey Unified School District, California

188  
**Socially Aware Algebra**  
6–8 Session  

Tired of using phone-plan and gym membership word problems? We created a bank of word problems based on social issues and diversity that enhance algebraic concepts. Economic diversity, gender equality, and literacy rates are used to reinforce linear equations and solving equations and other algebraic concepts. We hope to spark change through algebra.  

Deborah Gordon-Goodrich  
Montclair Kimberley Academy, New Jersey  
Gary Kaufman  
Montclair Kimberley Academy, New Jersey

189  
**Working Together to Assemble the Puzzle of Students’ Mathematical Strengths**  
6–8 Session  

This session describes the work of a professional learning community to identify and support students’ mathematical strengths. Presenters will share their journey to catalogue a taxonomy of student mathematical strengths, highlighting how the strengths form a puzzle and support the Standards for Mathematical Practice.  

Dorothy Y. White  
University of Georgia, Athens  
Nicholas Hussain  
Hilsman Middle School, Athens, Georgia  
Kristina Patel  
Clarke Middle School, Athens, Georgia

190  
**Algebra Intervention and Common Core: What’s the Intersection**  
9–12 Session  

Examine essential elements for algebraic intervention that support CCSS, the Standards for Mathematical Practice, problem solving, and writing. Explore conceptually based content that targets common barriers to algebraic success. Participants will engage in math and receive material that models the CCSS assessments and that supports ELLs and PLC structures.  

Mardi A. Gale  
WestEd, Sherman Oaks, California

191  
**Bringing Student Understanding to the Surface with Open-Ended Tasks**  
9–12 Session  

Do your students understand algebra 1 topics as well as you hope? In this session, we will present, explore, and discuss open-ended tasks designed to formatively assess student understanding and analyze student work on these tasks. After learning strategies for designing tasks of this nature, participants will create and share their own.  

Kyle Schultz, PhD  
James Madison University, Harrisonburg, Virginia  
Mallory Weingartner  
School District of the Chathams, Chatham, New Jersey  
Daniel Cassagne  
Metropolitan Expeditionary Learning School, New York, New York
192
**Fostering a Classroom Culture of Discourse**
6–8 Session
What are the tips and trade secrets for engaging students in meaningful mathematical discourse? Is it magic? Smoke and mirrors? No way. Participants will explore teacher moves to encourage a classroom culture that values student discourse, persistence and effort, and participation and engagement for all students.

*Bjorg Remmers-Seymour*
East Middle School, Rapid City, South Dakota

*Erin E Lehmann*
Rapid City Area School, South Dakota

193
**Planning an Assess-Respond-Instruct Cycle in Mathematics**
6–8 Session
Too often, students arrive at a new math concept without the pre-skills necessary to engage in it. An Assess-Respond-Instruct cycle can help to prepare students by finding out what they know and don’t know, responding to learning needs, and getting ready for rich new instruction. Increasing ability to engage math leads to increased achievement.

*Terry L. Johanson*
Saskatchewan Professional Development Unit, Saskatoon, Canada

*Sharon M. Harvey*
Saskatoon Public Schools, Canada

*Michele L. Naidu*
Saskatoon Public Schools, Canada

194
**Powerful, Playful Learning**
9–12 Session
Game-based learning is an effective way of engaging students with content, CCSS practices, and computational thinking skills. Learn about free online games and simulations from MIT and how to incorporate them into your teaching. These tools are useful for both middle and high school students.

*Susannah Gordon-Messer*
MIT Education Arcade, Cambridge, Massachusetts

*Louisa Rosenheck*
MIT Education Arcade, Cambridge, Massachusetts

*Carole Urbano*
MIT Education Arcade, Cambridge, Massachusetts

195
**Student-to-Student Mentoring in a Rich Problem-Solving Environment**
9–12 Session
Lois’s students needed chances to practice their mathematical communication. Arlene’s students needed chances to practice solving rich problems. The solution: Lois and Arlene’s students both solved the same problem, and then Lois’s students each mentored one of Arlene’s. Come learn about the hows, whys, and what happened in this multinational project.

*Lois Burke*
Charlottesville High School, Virginia

*Arlene Smith*
University of Trinidad and Tobago, Chaguanas Campus, Charieville

196
**Contexts for Complex Numbers**
9–12 Session
Students are often taught that complex numbers are solutions to previously unsolvable equations. This is historically inaccurate, and often unsatisfying to students. What are complex numbers good for? In this session we’ll share problems that create a need for complex numbers, while drawing connections between transformations, geometry, and algebra.

*Michael Pershan*
St. Ann’s School, New York, New York

*Max Ray*
The Math Forum @ Drexel University, Philadelphia, Pennsylvania
197  
Success = S^4 → Student-Centered Support for Struggling Students  
Higher Education Session  
We use writing assignments, online surveys, and other feedback strategies to encourage self-monitoring and promote independent learning by struggling students as they transition from high school to college level mathematics classes. Details of these activities and the effects on course grades and other measures of achievement will be shared.

Ingrid Peterson  
University of Kansas, Lawrence  
Susan Gay  
University of Kansas, Lawrence  
Elizabeth McClain  
University of Kansas, Lawrence

198  
GeoGebra + Complex Number Arithmetic: Implementing CCSSM  
9–12 Session  
High school students learn complex number arithmetic most frequently in the abstract. By using freely available GeoGebra software on an iPad or computer, a concrete representational approach helps learners to make spatial sense of the big ideas of complex number computation through a rich, meaningful, and connected framework. BYOD for guided practice.

David R. Erickson  
University of Montana, Missoula  
Armando M. Martinez-Cruz  
Cal State Fullerton, California

199  
The Surprise of Equivalent Problems  
9–12 Session  
Problem solvers take pleasure in observing that some problems can be solved by several different methods. The converse is also wonderful: two, maybe more, seemingly unrelated problems are linked by the same mathematics. The presenter, a co-editor of the Calendar feature in Mathematics Teacher, will share some “equivalent” problems with her audience.

Margaret E. Coffey  
Thomas Jefferson High School for Science and Technology, Alexandria, Virginia

200  
Role of Service-Learning in Understanding and Applying Mathematical Content  
Preservice and In-Service Session  
Learn how partnerships in a local community center and international schools build upon mathematical strengths and address areas that need improvement. Fractional activities are the focus for two-way learning and capacity building. Participants will engage in activities to experience how service-learning projects directly impact student learning.

Amy Lingo  
University of Louisville, Kentucky  
Kristin E. Harbour  
University of Louisville, Kentucky  
E. Todd Brown  
Retired, University of Louisville, Kentucky
12:30 P.M.–1:30 P.M.

**201**

What Knowledge Do Secondary Geometry Teachers Need to Be Effective?

Research Session

Teaching geometry concepts such as surface area/volume and similarity/congruence in a climate of high stakes testing can be a daunting and challenging task. The Geometry Assessments for Secondary Teachers, an NSF-funded project, will report on its research results revealing what factors impact student achievement in secondary geometry classrooms.

Margaret Mohr-Schroeder  
University of Kentucky, Lexington  
Susan A. Peters  
University of Louisville, Kentucky  
Robert N. Ronau  
University of Cincinnati, Ohio

**201.1**

Misconceptions Squared!

General Interest Exhibitor Workshop

How do we correctly identify misconceptions in math? How do we know where students need to start? This session covers questioning strategies for elementary and middle school classrooms, focusing on number and fractional concepts. Join mathematics professor Dr. Gladis Kersaint and help learners live mathematical practice standards through discourse.

Curriculum Associates  
North Billerica, Massachusetts

**201.2**

Mathematical Fluency the Common Core Way

Pre-K–5 Exhibitor Workshop

Can your students perform calculations and solve problems quickly and accurately? Building mathematical fluency is an expectation in CCSSM. Saxon Math develops procedural skills and promotes mastery using a multisensory lesson design and continual practice and review. Join us for brain-based teaching strategies for automatizing toward fluency.

Houghton Mifflin Harcourt  
Boston, Massachusetts

**201.3**

Presidential STEM Teachers: PAEMST Success for K-12 Educators

Pre-K–12 Exhibitor Workshop

K-12 teachers are invited to apply to the Presidential Awards for Excellence in Mathematics and Science Teaching. Recipients receive a paid trip to Washington, D.C., a citation signed by the President of the United States, and $10,000. Past awardees will discuss the application process and their leadership roles as PAEMST alumni.

Booz Allen Hamilton (PAEMST)  
Herndon, Virginia

**201.4**

Pearson’s CMP3: Get Connected with NSF Middle School Math!

6–8 Exhibitor Workshop

Experience CMP3, the newest edition of the inquiry-based Connected Mathematics Project. See what’s new, including updated CCSS-aligned content and easy-to-use mobile tools that help with classroom management and capture student work on the go. Find out how students benefit from interactive digital student pages that allow for instantaneous sharing and more effective group work.

Pearson  
Upper Saddle River, New Jersey

**201.5**

CCSS Math Practices? Trust CPM’s 25 Years Of Writing Experience!

9–12 Exhibitor Workshop

Experience the mathematical practices embedded in lessons that include problem solving and discourse. The Core Connections series embeds the practices daily in a problem-based, student-centered CCSS-aligned curriculum for grade 6–algebra 2 (option for high school Integrated I-III). Receive free copies of CPM’s entire Core Connections series.

CPM Educational Program  
Sacramento, California
12:30 P.M.–1:30 P.M.

201.6 **Maximizing Technology in the Shift to Common Core**
General Interest Exhibitor Workshop
Showcase of new instructional strategies that address student cognitive and social needs. The experience will include a full demo of the Pearson System Courses, a full digital curriculum for ELA and Math. You have never seen instruction like this!

Pearson
Upper Saddle River, New Jersey

152 (BCEC)

1:00 P.M.–2:15 P.M.

202 **Exploring the FUN-damental Theorem of Calculus**
9–12 Gallery Workshop
The fundamental theorem of calculus is an essential topic for students to know well and understand to succeed in calculus. In this workshop, teachers will learn how hands-on activities can be used to enhance student understanding of the fundamental theorem of calculus. Join us in doing some of these activities and learn how to create your own!

Angie Hodge
University of Nebraska Omaha

Janice Rech
University of Nebraska Omaha

259 B (BCEC)

203 **Bringing Practice Standards to Life: Every Operation Tells a Story**
Pre-K–2 Gallery Workshop
Mathematizing real-world problems engages learners in developing conceptual understanding and fluency in joining, separating, comparing, and equalizing sets. We’ll explore how this approach reflects the CCSSS Standards for Mathematical Practice that call for both first- and second-language learning children to be problem solvers and mathematical thinkers.

Mary Hynes-Berry
Erikson Institute, Chicago, Illinois

Rebeca Itzkowich
Erikson Institute, Chicago, Illinois

252 A (BCEC)

204 **Number Choice: Building Children’s Mathematical Understanding**
Pre-K–2 Gallery Workshop
This session will discuss explicit strategies and examples for using number choice to address the content, strategies, and practices in the CCSSM. Number choice is the strategic use of numbers and number combinations in the context of problem types. We provide examples of and strategies for using number choice to engage and challenge all students.

Molly B. Sweeney
Des Moines Public Schools, Iowa

Jennifer M. Johnson
Des Moines Public Schools, Iowa

Natalie A Franke
Waukee Community Schools, Iowa

COMMONWEALTH A-B (WESTIN)

205 **Using Student Interview Videos to Analyze Mathematical Thinking and Development**
Preservice and In-Service Gallery Workshop
Learn strategies for designing tasks aligned with CCSSM for student interviews to capture and reveal children’s mathematical thinking. A process for analyzing students’ mathematical development as revealed through interviews will be presented. Student videos will be used to engage participants in tasks and analysis of children’s mathematical thinking.

Kelli Thomas
University of Kansas, Lawrence

Mari Flake
University of Kansas, Lawrence

156 C (BCEC)

Don’t miss the Closing Session on Saturday afternoon with featured speaker and Discovery Channel producer Dr. Mike North!
206
Counting Matters: Why We Should Pay More Attention to Counting
Pre-K–2 Gallery Workshop
This session explores an important concept in early number: counting. Participants will explore number routines and instructional conversations that they can implement in their classrooms to support students’ counting abilities. We will explore the richness of mathematical work that teachers can pursue to deepen children’s understanding of number.

Elham Kazemi
University of Washington, Seattle
Allison Hintz
University of Washington Bothell
Kassia Omohundro Wedekind
Fairfax County Public Schools, Arlington, Virginia

208
Math Journaling: A Reflection of Authentic Learning
3–5 Gallery Workshop
In this research-based presentation, participants will explore the use of journals as formative assessment, types of tasks to engage all learners, rubrics aligned to standards, and capture the creativity and learning style of each student. This session will promote the 5 Practices for Orchestrating Productive Mathematics Discussions by Mary Kay Stein.

Christine Joseph
University of South Florida, Tampa
Natalie Reiser
Pinellas County Schools, Largo, Florida

209
Operations and Algebraic Thinking: Building Bridges to Higher Mathematics
Preservice and In-Service Gallery Workshop
Why teach operations in a technological world? The bar has been raised: our greater purpose is algebraic thinking, hence the Common Core domain for Operations and Algebraic Thinking. Come explore addition/subtraction (pre-K–2), multiplication/division/fractions (3–5), ratios/proportions (5–7) through new lenses, and understand them as the seeds of algebra.

Monica Neagoy
Monica Neagoy Consulting Services, Arlington, Virginia

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GRAND BALLROOM C (WESTIN)
1:00 P.M.–2:15 P.M.

210
Number Sense Using Number Lines for Grades 3–5
3–5 Gallery Workshop
Number lines are useful in building number sense. Strategies will be shared to help build number sense across Common Core strands including addition/subtraction, estimation/rounding, multiplication/division, and fractions. Strategies will include work in multiples-based number lines, midpoints, and even increments when building number lines.

Sandra Brodney
Douglas L. Jamerson, Jr. Elementary School, St. Petersburg, Florida
Lukas Hefty
Douglas L. Jamerson, Jr. Elementary School, St. Petersburg, Florida

211
Using Rectangles, Number Lines, and Smiley Faces for Fraction Operations
3–5 Gallery Workshop
Learn to use rectangles and number lines to model common denominators to compare, order, add, subtract, multiply, and divide fractions. These faithful models show how two different denominators can work together on the same whole, helping to eliminate the need for a different procedure for each fraction operation.

Jennifer W. Synold
bby Publications at University of West Alabama, Livingston

212
Music and Mathematics: A Sweet Symphony in the Classroom
3–5 Gallery Workshop
What happens when math teachers and music teachers work together? A sweet symphony! This hands-on session will show how mathematics was integrated into music with the aim of improving the lives of children in marginalized communities in Tijuana, Mexico. Participants will construct a monochord and a xylophone using fractions and everyday materials.

Rita Sanchez
Teachers College, Columbia University, New York, New York
Monica Abrego
Baja Musical Arts Initiative, New York, New York

213
Number Sense with a Dash of Culture
Pre-K–2 Gallery Workshop
A strong sense of number is a recipe for gaining mathematical understanding in future mathematics courses. These tasks burst to life when they make meaningful global connections. In this presentation, we will present globally connected, number sense tasks and talk about what we learned while presenting them to teachers in Guatemala and Ecuador.

Chrrystal Dean
Appalachian State University, Boone, North Carolina
Linda Goeller
Seminole State College, Oklahoma
Carlos Lopez Levia
University of New Mexico, Albuquerque

214
Planning for Productive Mathematics Discussions
6–8 Gallery Workshop
Our Math-Science Partnership Grant teachers developed a protocol based on Smith and Stein’s work to plan and achieve productive mathematics discussions to implement the mathematical practices and deepen student learning. Experience the process and receive copies of the protocol and example problems.

Joan T. Commons
Retired, San Diego, California

215
Promoting Algebraic Thinking through the Lens of Number
3–5 Gallery Workshop
Get ready to experience engaging student-centered learning activities that transform arithmetic into opportunities for students to wrestle with real-world problem-solving situations, discover patterns, make generalizations, and justify solutions. Leave with classroom-ready activities and ideas that you can use immediately.

Carolyn L. White
Rice University School Mathematics Project, Houston, Texas
Susan Troutman
Rice University School Mathematics Project, Houston, Texas
1:00 P.M.–2:15 P.M.

216 Getting Students to Argue in Class with Number Sense Activities
6–8 Gallery Workshop
This workshop will focus on creating productive mathematical discourse and getting students to constructively argue. Explore activities connected to the Common Core requiring students to construct viable arguments, critique the reasoning of others, and use sense making. Focus on classroom implementation, student support, and free online resources.
Andrew Stadel
Tustin Unified School District, California

217 NCTM’s Principles to Actions: Putting the Punch in Proportional Reasoning
6–8 Gallery Workshop
NCTM identifies eight instructional moves for teaching with equity. We will begin with examples of middle grades teachers applying these moves, followed by in-depth applications of a proportional reasoning unit. Participants will use easy-to-manage, inexpensive-to-prepare, hands-on activities to explore proportionality and connections to prealgebra.
Gail R. Englert
Blair Middle School, Norfolk Public Schools, Virginia
Yvelyne Germain-McCarthy
University of New Orleans, Louisiana

218 SCUBA Divers and Race Car Drivers: Connecting Science to Mathematics
6–8 Gallery Workshop
Do you feel the need for speed? Accelerate your science content knowledge and put the pedal to the metal as you increase your “function”-al literacy in mathematics. This workshop puts you on the fast track to investigating and representing linear functions through proportional reasoning and simulations of decompression sickness and auto racing.
Thomas J. Fernsler
University of Delaware, Newark

219 What’s What with Ratios and Proportions?
6–8 Gallery Workshop
This session will focus on tasks that build conceptual understanding of ratios and proportion, thus preparing students for future work in linear functions. Participants will engage in ready-to-use activities for sixth- and seventh-grade classrooms, and will understand of the differences in the ratio and proportion content of these grade levels.
Marissa McClish
Regional Professional Development Program, Reno, Nevada
Vicki Collaro
Washoe County School District, Reno, Nevada

220 Developing Algebraic Reasoning with Visual Patterns
Preservice and In-Service Gallery Workshop
Participants will experience various examples of how growing patterns modeled with toothpicks, two-color counters, and pattern blocks can be teamed with unexecuted number expressions to introduce and reinforce algebraic expressions to students in grades 3–9. Mathematical Practice 3 will be highlighted throughout the presentation.
Audrey N. Bullock
Austin Peay State University, Clarksville, Tennessee

221  28 (A Perfect Number) Activities for Student Engagement and Discourse
9–12 Gallery Workshop
Come learn 28 (a perfect number) activities to promote student discourse and engagement that can also be used for informal assessment in any mathematics classroom in 6–12. Participants will participate in and learn numerous ways to turn any worksheet into an engaging activity.
Gregory S. Fisher
Mount Tabor High School, Winston-Salem, North Carolina
Fred Thompson
East Forsyth High School, K Bernardino, North Carolina
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1:00 P.M.–2:15 P.M.

222  
6–8 Gallery Workshop  

Discover how to engage students in mathematical vocabulary to deepen their understanding of content knowledge and create meaningful learning. Come and experience this hands-on approach to teaching vocabulary through the lens of a student and leave with CCSSM vocabulary strategies that you can immediately implement in the classroom as a teacher.

Kimberly Gail Williams  
University of Tennessee at Martin  

210 A (BCEC)

223  
**Problem Posing: Asking “What-If-Not?” with Patterns, Functions, and Geometry**  
9–12 Gallery Workshop  

Problem posing turns students and teachers into producers—not just consumers—of mathematics. Asking “what if . . . not?” and changing just one element of a familiar task can open up new territory, inspire excitement, and lead to deeper analysis. Explore new problems based on familiar topics and see ways other teachers have handled them.

Jane M. Kang  
Education Development Center, Inc., Waltham, Massachusetts  
E. Paul Goldenberg  
Education Development Center, Inc., Waltham, Massachusetts  
Sarah E. Sword  
Education Development Center, Inc., Waltham, Massachusetts  

258 B (BCEC)

224  
**Cooperative Activities for Calculus**  
9–12 Gallery Workshop  

Group and partner activities to get students active and talking. Participants will find the volume of a solid of revolution, take a journey through a slope field, and work with an AP review activity. Ready to bring back to your classroom.

Karen E. Hyers  
Tartan High School, Oakdale, Minnesota  

GRAND BALLROOM E (WESTIN)

225  
**Engaging Tasks for Promoting Combinatorial Understanding, Reasoning, and Problem Solving**  
9–12 Gallery Workshop  

Participants will solve several problems with combinations (and permutations). Some of the results will be very surprising. They will then complete two activities that can be used to enhance student learning. The first uses playing cards; the second, dice. Students will become very engaged in the learning process with these activities.

James R. Matthews  
Siena College, Loudonville, New York  

160 B/C (BCEC)

226  
**Handheld Technology + Hands-On Activities = CCSS Success!**  
9–12 Gallery Workshop  

Handheld technology coupled with inquiry-based learning helps students to better apply linear, quadratic, and exponential functions to their real-world applications. Participants are provided with classroom-ready, hands-on lessons that synthesize the Statistics, Functions, and Modeling strands of the Common Core State Standards.

Tom Beatini  
Glen Rock High School, New Jersey  

205 A (BCEC)

227  
**Triangles, Probability, and Amazement: A Connected Experience for the Classroom**  
9–12 Gallery Workshop  

This workshop will explore an intriguing set of classroom-tested problems that mesh geometry, algebra, and probability. The problems and their contexts are engaging and loaded with mathematical insights. These laboratory-style experiences utilize reasoning, sense making, and connections.

Jim Rubillo  
Former Executive Director, National Council of Teachers of Mathematics, Reston, Virginia  

210 C (BCEC)

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**Assessing the Common Core**  
**Equity**  
**Exhibitor Workshop**  
**Integrating Math with Other Disciplines**  
**NCTM Committee**  
**New Teacher**  
**Problems Worth Solving**
2:00 P.M.–3:00 P.M.

**228**

**Moving Principles into Actions: Leading Change in Mathematics Programs (9–12)**

9–12 Session

In *Principles to Actions*, NCTM sets forth a vision to support the goal of ensuring the mathematical success of all students. This session introduces professional learning resources designed to support teachers and other stakeholders as they strive to achieve the vision outlined in the principles, with a particular emphasis on high school.

**W. Gary Martin**  
Auburn University, Alabama  
**Daniel J. Brahier**  
Bowling Green State University, Ohio  
**Joanne Wells**  
Eclectic Middle School, Alabama

COMMONWEALTH C (WESTIN)

**229**

**Making the Connection between Math and Language for ELLs**

6–8 Session

We will examine how language use in the math class can be an obstacle for English language learners. We will learn strategies to help ELLs increase their content and academic vocabulary and improve their writing. This session is for anyone who works with ELL students but has not had any formal training in working with second-language learners.

**Lorie Banks**  
Holyoke Public Schools, Massachusetts

154 (BCEC)

**230**

**Five Years of Common Core State Mathematics Standards: Essential Actions for Moving Forward**

General Interest Session

The Common Core State Standards were released five years ago to ensure that all students graduate from high school with the skills and knowledge necessary to succeed in college, career, and life, regardless of where they live. Their widespread adoption, coupled with the development of common assessments, is an unprecedented opportunity for systemic improvement in mathematics education. Where are we today? What have we learned? What are the implications of recent developments and national reports for mathematics curriculum, instruction, and assessment, including future refinement of CCSSM? And, most importantly, what actions should each of us, as teachers, school and district leaders, and professional organizations, including NCTM, take to move mathematics education forward?

**Diane J. Briars**  
President, National Council of Teachers of Mathematics, Reston, Virginia

BALLROOM EAST (BCEC)

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INTRODUCING BRIDGES IN MATHEMATICS

Bridges in Mathematics, second edition, is a comprehensive K–5 curriculum that equips teachers to fully implement the Common Core State Standards in a manner that is rigorous, engaging, and accessible. Join us for an overview of this unique program – learn more about work places, visual models, and putting the mathematical practices into action.

Presented by Pia Hansen.
2:00 P.M.–3:00 P.M.

231 SL

Response to Intervention: Strategies for Teaching Mathematics in Grades 1–5

General Interest Session

This session focuses on research-based instructional strategies and interventions (RtI) to promote stronger student learning through “doing math.” Embedded within these strategies that support all learners are opportunities for students to communicate their ideas in multiple ways, use models and representations, and develop robust skills.

Karen Karp
University of Louisville, Kentucky

232

Standards for Mathematical Practice: Questioning Is One Key to Success!

General Interest Session

In this session you will learn five elements of effective questions and discover how asking effective questions can provide opportunities for your students to demonstrate the Standards for Mathematical Practice. You will leave with a set of questions focused on each of the eight Standards for Mathematical Practice.

Maggie B. McGatha
University of Louisville, Kentucky
Jennifer M. Bay-Williams
Board of Directors, National Council of Teachers of Mathematics; University of Louisville, Kentucky

233

iPad Games Are Fun, but Can They Help Me Differentiate?

Pre-K–2 Session

Students play math games on their iPads, but then what? How do teachers keep track of what they’ve learned? Find out how one district uses cognitive research–based iPad games to teach CCSSM strategies. Learn how game-based learning analytics help teachers to track their students’ understanding, target intervention, and differentiate instruction.

Rachael Labrecque
Teachley, New York, New York
Linda Mumme
Central York School District, Pennsylvania
Lauri Brady
Central York School District, Pennsylvania

234

Math Talk in the Primary Classroom

Pre-K–2 Session

Through number talks and problem solving, students in primary classrooms can learn to be flexible thinkers and to communicate their thinking with others. Samples of student thinking and problem solving will be discussed. Participants will leave with ideas that can be easily implemented to increase productive math talk in their classrooms.

Lori Price
St. Johns County Schools, St. Augustine, Florida

235

Using Routines in a Non-Routine Way to Teach the SMPs

Pre-K–2 Session

This session will discuss how the use of routines in the early childhood classroom can be used to exemplify the CCSS Standards for Mathematical Practice. Specific routines will be shared that connect to the various domains with suggestions for differentiation in order to allow routines to grow and deepen as the year progresses.

Susan Looney
Looney Math Consulting, North Easton, Massachusetts
Kristen Carr
Westwood Public Schools, Massachusetts
Cheryl Condon
Wellesley Public Schools, Massachusetts

236

Pulling Together to Promote Innovative Practices: A K–College Partnership

Preservice and In-Service Session

It is never too late to learn effective approaches to teaching math in elementary classrooms. In this session, we share a unique partnership between an elementary math coach, a university professor, and a school district. The partnership helps in-service and preservice teachers to use promising practices that support math success for all students.

David Coffey
Grand Valley State University, Allendale, Michigan
Kassia J. Omohundro Wedekind
Fairfax County Public Schools, Falls Church, Virginia
Kristin Frang
Muskegon Area Intermediate School District Regional Mathematics & Science Center, Michigan

209 (BCEC)
207 (BCEC)
2:00 P.M.–3:00 P.M.

237 Early Algebra Problems Worth Solving and Why
3–5 Session
Although the development of children’s algebraic thinking is a clear mandate in educational reforms, understanding the types of problems that have deep algebraic value is not always clear. Using video vignettes and research-based tasks, this presentation explores the algebraic value of early algebra problems and their connections to the Common Core.

Maria Blanton
TERC, Cambridge, Massachusetts

238 Divide and Conquer: Making Sense of Division of Fractions
6–8 Session
Understanding fraction division predicts high school math achievement, yet is a mystery for many students. Join us to explore print and online materials proven to give students a deep understanding of division of fractions using the CCSS practice standards and a variety of models and situations, including partitive, quotative, comparison, and area contexts.

Linda Jensen Sheffield
Northern Kentucky University, Highland Heights

240 Moving beyond Common Denominators: Comparing Fractions Using Reasoning and Sense Making
3–5 Session
The common denominator approach can be used to compare any two fractions, but it is not always the most efficient strategy. Participants will develop alternative strategies for comparing fractions that draw upon number sense and reasoning, consider instances in which each strategy would be useful, and discuss how these strategies align to CCSSM.

Amy Hillen
Kennesaw State University, Georgia
Dana Olanoff
Widener University, Chester, Pennsylvania
Rachael M. Welder
Hunter College–CUNY, New York, New York

241 Slowing Down and Making Sense: Launching and Exploring Rich Problems
3–5 Session
What does it take to get a room full of elementary or middle school students persisting on a rich task? Lots of careful setup and planning! We’ll analyze stories and videos of teachers implementing rich tasks, and we’ll learn about effective ways to help students understand problems well enough to solve them and persevere during independent work time.

Max Ray
The Math Forum @ Drexel University, Philadelphia, Pennsylvania

242 Competition Mathematics: Developing Better Problem Solvers
6–8 Session
Middle school mathematics competitions can be used along with the Common Core content standards and mathematical practices to help students develop deeper understanding and greater problem-solving skills. Problems will be presented so that attendees will experience the progression of problem-solving strategies.

Cathy G. Stinson
Dent Middle School, Columbia, South Carolina

243 Learning Slope via Rate Not Rote
6–8 Session
Being able to recite the slope formula is not good enough. During this session we will examine concepts of rate, unit rate, and the constant of proportionality as they relate to slope—specifically, that the slope of a proportional relationship is equal to the unit rate. Further, we will model how to use similar triangles to derive the slope formula.

Stefanie M. Hassan
Curriculum Associate and Lead Writer, Common Core, Inc., Los Angeles, California
Erika J. Silva
Common Core, Inc., Washington, D.C.
2:00 P.M.–3:00 P.M.

244
CCSSM Mathematical Practice Standards in Action: Classroom Strategies for Implementation
Research Session

What does it mean to integrate the Standards for Mathematical Practice into the teaching of algebra? Discuss how educators have made these practices an explicit part of instruction and how the strategies apply to your classes. Video, student work, and results from two research studies will focus on strategies to develop the mathematical practices with students.

Mary Beth Piecham
Education Development Center, Inc., Waltham, Massachusetts

Miriam Gates
Education Development Center, Inc., Waltham, Massachusetts

Mike Steele, Ed.D
University of Wisconsin–Milwaukee

211 (BCEC)

245
Geometric Transformations and Algebraic Functions: Two Sides of a Coin
General Interest Session

In grades 7–12, CCSSM expects students to understand transformations as functions. This profound link allows students to build a transformation, drag its input (a point), describe the output’s behavior, restrict the domain to a number line, and voilà!—end up with a linear function and its Cartesian graph. Leave with student-ready GSP activities.

Scott Steketee

Daniel Scher
KCP Technologies, New York, New York

211 (BCEC)

246
Mapping the Standards for Mathematical Practices to Algebra I Content
9–12 Session

In the age of CCSSM, teachers are faced with incorporating the Standards for Mathematical Practice into daily lessons. Using slope as an example, we will explore the idea that different problems promote engagement with particular practices and that different topics are more or less suitable for each SMP. We will also share a map of the SMPs across a sample curriculum.

Zuzka Blasi
Education Development Center, Inc., Waltham, Massachusetts

Courtney E. Arthur
Education Development Center, Inc., Waltham, Massachusetts

215 (BCEC)

247
Putting the REAL in Real-World Math Problems
9–12 Session

Math is abundant in our world. Effectively teaching all students to recognize it is a challenge. Come examine aspects of “real-world” math problems; categorize them as rigorous, engaging, authentic, and legitimate (REAL), or completely ridiculous, artificial, and pathetic; and explore new strategies for developing REAL problems.

Beau J. Bailey
Curriculum Associate, Common Core, Inc., Lyons Falls, New York

Scott Baldridge
Louisiana State University; Lead Writer and Mathematician, Common Core, Inc., Baton Rouge

259 A (BCEC)

248
Mathematical Modeling in the Social and Biological Sciences
9–12 Session

New computational models being developed are altering our understanding of the social and biological sciences. This presentation will highlight new modeling approaches that our students will use in their careers. As modeling becomes a focus in our classrooms, these models will add greatly to our students’ engagement with mathematics.

Daniel J. Teague
North Carolina School of Science and Mathematics, Durham

210 B (BCEC)
2:00 P.M.–3:00 P.M.

249 Standards-Based Grading: Right for You?

9–12 Session

Many schools are now considering standards-based grading as a way to boost student achievement. How does it work? Should you switch? What are the real advantages and disadvantages? Hear a frank appraisal from two teachers who’ve used the system successfully.

Ben Hyman
Walter Payton College Prep, Chicago Public Schools, Illinois

Jill Tani
Walter Payton College Prep, Chicago Public Schools, Illinois

159 (BCEC)

250 Tired of Plain Old Tests and Bell Ringers? Introducing Alternative Assessments

9–12 Session

See innovative ways to assess student learning through hands-on applications, infographics, anonymous polling, collaborative work, and error analysis. Emphasis will be on both formative and summative assessments. Assessments from geometry and precalculus will be provided but can be adapted easily to other math content.

Niccole Taylor
Virginia Commonwealth University, Richmond

DOUGLASS (WESTIN)

251 The Role of Logic in Teaching Proof

9–12 Session

The reasoning used in mathematical proof is based on linguistic and logical conventions that are rarely made explicit to students. Familiarity with basic logical principles can help resolve the mystery—both for what teachers say in class and for the mathematical tasks students are asked to perform by themselves.

Susanna S. Epp
DePaul University, Chicago, Illinois

253 B (BCEC)

252 Transition from School to University Maths: An Australian Story

Higher Education Session

President’s Series presentation In Australia the issue of mathematically underprepared students starting university STEM courses (Science, Technology, Engineering, and Mathematics) is bringing together school teachers and university academics for long overdue discussions. This talk will illustrate steps being taken to improve the transition experiences of these students.

Mary P. Coupland
University of Technology, Sydney, Australia

254 A/B (BCEC)

253 Visualizing Key Concepts in Statistics

Higher Education Session

Many students are confused by the definitions, formulas, and procedures of statistics. As a result, the study of statistics may become a rote activity. The focus of this presentation will be on some of the software, apps, and websites that provide dynamic visualization of important concepts in statistics in order to reinforce meaning for students.

James J. O’Keefe
Lesley University, Cambridge, Massachusetts

252 B (BCEC)

254 Structure and Regularity: Focus on Mathematical Practices 7 & 8

Preservice and In-Service Session

Leaders need to help teachers become fluent with CCSSM’s mathematical practices. Rich tasks that illuminate MP.7 and MP.8 will be shared along with a resource that supports leaders in this effort. We also will address how to assess teachers’ identification of structure and regularity in tasks.

Judith E. Jacobs
JEJMath Ltd., Ann Arbor, Michigan

Dave I. Kennedy
Shippensburg University, Pennsylvania

Diana Sherman
University of Michigan, Ann Arbor

GRAND BALLROOM D (WESTIN)
2:00 P.M.–3:00 P.M.

254.1 \[\text{ew}\] 
Building Student Motivation, Engagement, & Growth in Mathematics Learning 
General Interest Exhibitor Workshop

Experience a Zometool investigation, exploring firsthand the possibilities Zometool opens for interactive, engaging mathematics learning. All investigations are aligned with national standards, built on research-based practices, designed for use with teachers’ own unit plans, and differentiated to meet a range of learner needs in classrooms today.

Zometool, Inc.  
Longmont, Colorado

254.2 \[\text{ew}\] 
enVisionmath2.0 
Pre-K–5 Exhibitor Workshop

Experience how problem-based learning through Math Practices uniquely develops the depth of understanding and rigor needed for success on high-stakes tests.

Pearson  
Upper Saddle River, New Jersey

254.3 \[\text{ew}\] 
Meaningful Math Models and the Common Core 
Pre-K–6 Exhibitor Workshop

Come learn about math drawings and other math models that can be used in the classroom to show the mathematical aspects of a situation. Students make math drawings on their MathBoards, where parts of a drawing can be used while a student is explaining their solution method. Math drawings incorporate several of the Mathematical Practices.

Houghton Mifflin Harcourt  
Boston, Massachusetts

254.4 \[\text{ew}\] 
Math Upgrade Common Core Lessons Using Songs, Video, and Games 
6–8 Exhibitor Workshop

Math Upgrade features musical, high-interest lessons covering all Common Core standards for grades 1 to 8. Find out how teachers transform their classes using interactive whole-class lessons and individual online courses. Learn how special needs and far below basic students can master the Common Core curriculum. Join us for math, music, and fun!

Learning Upgrade, LLC  
San Diego, California

254.5 \[\text{ew}\] 
Exploring Wireless Mathematics for Algebra & Geometry 
9–12 Exhibitor Workshop

In this interactive hands-on workshop we will be solving algebra and geometry problems with the HP Prime Graphing Calculator and brand new Wireless Connectivity Kit. See how schools are benefiting from this advanced technology and discover how you can send instant polls, send/collect data, create apps, view student screens and more!

Hewlett-Packard  
Fort Collins, Colorado

254.6 \[\text{ew}\] 
Five Teaching Practices that Inspire STEM Careers 
3–5 Exhibitor Workshop

Research makes the case for getting students ready for Algebra and starting early. How can we nurture a love of mathematics and fill the ranks of STEM careers? This workshop will present an overview of easy-to-implement, teaching practices that build skill proficiency, deepen conceptual understanding, and inspire confidence for mathematics.

Think Through Math  
Pittsburgh, Pennsylvania
2:45 P.M.–4:00 P.M.

255
Who Is Doing the Math?
3–5 Gallery Workshop
In order for mathematics to make sense for students, they must build their own understanding through problem-based mathematics. Join us to examine the core differences between a problem-based approach to mathematics and direct instruction. Find out how teaching in a problem-based format increases understanding and also supports the Standards for Mathematical Practice.
Tabetha R. Finchum
Flowing Wells School District, Tucson, Arizona

256
Routines and Strategies for Developing Student Success in Problem Solving
3–5 Gallery Workshop
The most successful problem solvers are metacognitive—they attend to how they think as they make sense of and solve problems. They tackle problems with confidence and persistence. Join us as we explore strategies to effectively develop students’ problem-solving skills and dispositions.
Kathy Ernst
Thinking Foundation, Lyme, New Hampshire

257
Generate Many More Numerically Nimble Young Students
Pre-K–2 Gallery Workshop
Discover ways to efficiently implement CCSS, particularly the Standards for Mathematical Practice. These engaging activities and strategies promote greater sense making as all students increase their numeric fluency and proficiency. Selected activities differentiate instruction, infuse algebraic thinking, and enhance students’ reasoning abilities.
Laura Choate
Fallbrook Union Elementary School District, California
Leigh Childs
San Diego County Office of Education, California

258
Language Arts, Math, and Science . . . Oh My!!!
Pre-K–2 Gallery Workshop
This workshop will allow the participants to actively engage and experience activities for pre-K–2 mathematics that naturally integrate language arts and science. The activities will utilize hands-on materials and will also reinforce the CCSSM standards for those grades. A bibliography of materials used will be provided.
Maria Diamantis
Southern Connecticut State University, New Haven
Adam Goldberg
Southern Connecticut State University, New Haven

259
Helping Early Learning Teachers Fall in Love with Math!
Pre-K–2 Gallery Workshop
Often beginning teachers select the earliest grades because they look forward to teaching young children how to read, and confidentially they dislike math. Come learn some great ways to help these teachers fall in love with math so they can pass those attitudes on to their students. Or fall in love with early childhood math all over again yourself!
Jennifer Rising
Council of Presidential Awardees in Mathematics (CPAM), Chicago, Illinois

260
Imagine, Innovate, and Inquire with Tools and Technology
3–5 Gallery Workshop
Experience mathematical learning enhanced with tools and technology. Engage in dynamic activities that support the integration of digital learning experiences. Transformative ideas you can apply in your classroom to assist students in visualizing and understanding math concepts and support students’ mathematical reasoning and problem solving.
Angela M. Waltrup
Frederick County Public Schools, Maryland
Christopher R. Horne
Frederick County Public Schools, Maryland
2:45 P.M.—4:00 P.M.

261  
**Making “MODEL” Students: Using Math Models That Grow with Students**  
Pre-K–2 Gallery Workshop

Development of modeling skills is one of the best ways to set your math students up for success! It empowers them with “entry points” into any problem-solving situation. Attendees will explore using number tracks/number lines, number bonds, and bar diagrams—all models that grow with students through each grade of the Common Core Progressions.

**Patti J. Dieck**  
Conceptual Learning Associates, Amityville, New York  
**Christopher M. Sarlo**  
Conceptual Learning Associates, Amityville, New York

262  
**You Do, We Do, I Do**  
3–5 Gallery Workshop

Do you want flexible thinkers and problem solvers in your classroom? How do you provide opportunities for students to develop healthy mathematical habits of mind? Come experience what it is like to be immersed in the Standards for Mathematical Practice and how to implement the “You Do, We Do, I Do” structure into your math instruction.

**Ruby Mora**  
Clark County School District, Las Vegas, Nevada  
**Rebecca Dehner**  
Clark County School District, Las Vegas, Nevada

263  
**Brown Bag Ideas for Parents**  
3–5 Gallery Workshop

We need parents to join in building student confidence in mathematics. We want parents to see that math is a part of daily life and share that with their children. Participants will have the opportunity to learn some engaging ideas for involving parents in activities with fractions and decimals.

**Patsy F. Kanter**  
PK Consultants, New Orleans, Louisiana  
**Susan D. Rogalski**  
Self-Employed Consultant, Bedford, Massachusetts

264  
**Teaching Multiplication and Division for Meaning**  
3–5 Gallery Workshop

Many children struggle with multiplication and division because it is taught through rote algorithms. This workshop will cover a progression of meaningful steps to teach multiplication and division. Strategies covered include using grouping and array models, number lines, ratio tables, halving and doubling, and partial products and differences.

**Stacey Daly**  
Madison Public Schools, Connecticut

265  
**Formative Assessment Pathways: Monitoring Student Learning EVERYDAY!**  
3–5 Gallery Workshop

Formative Assessment Pathways: classroom assessment techniques that teachers can use to not only monitor instruction but also guide understanding of important mathematics. Regular use of observations, interviews, “show me” activities, hinge questions, and exit tasks are assets of quality instruction. See how this works with fractions!

**Francis (Skip) Fennell**  
Past President, National Council of Teachers of Mathematics; McDaniel College, Westminster, Maryland  
**Beth Kobett**  
Stevenson University, Baltimore, Maryland  
**Jon Wray**  
Board of Directors, National Council of Teachers of Mathematics; Howard County Public Schools, Ellicott City, Maryland

266  
**Making Our Base-10 Number System Concrete and Comprehensible**  
3–5 Gallery Workshop

The foundation of mathematics is a conceptual understanding of our base-10 number system. Such groundwork includes identifying numerals used in base 10, connecting symbolic representations of the number 10 using both groupable and pre-grouped manipulatives, and switching bases to more fully understand the challenges students face in the classroom.

**Stacy K. Boote**  
University of North Florida, Jacksonville
267
What Fraction of Students’ Knowledge of Fractions Can You See?
3–5 Gallery Workshop

Why are fractions hard? Explore multiple meanings, misconceptions, strategies, & representations of fractions, & learn how to help build students’ fraction knowledge aligned with CCSSM. Engaging with videos of kids solving fraction tasks, you will work on designing your own rich tasks & on honing skills for students to uncover their thinking.

Nicole L. Fonger  
University of Wisconsin–Madison
Dung Tran  
North Carolina State University, Raleigh
Natasha Elliott  
Friday Institute for Educational Innovation, Raleigh, North Carolina

205 C (BCEC)

268
A Mathematical Mystery Tour of Engaging Math Work Stations
6–8 Gallery Workshop

First stop: several models of implementation. Next stop: a variety of meaningful tasks and differentiated activities allowing you to intervene with a small group. From strategic games to high-level thinking puzzles and problems; experience some of the stations we use to help our students succeed. Last stop: assessment and accountability ideas.

Marilyn Dibble  
Topeka Public Schools, Kansas
Sara Corwin  
Topeka Public Schools, Kansas

160 B/C (BCEC)

269
Playing with Place Value
3–5 Gallery Workshop

Place value concepts are presented using games to teach, reinforce, and remediate students. These games provide fun ways to write numbers in expanded and standard form, order and compare whole and decimal numbers, and strategically place digits to develop a better understanding of place value through problem solving and mathematical reasoning.

Kathie O. Smart  
University of Louisiana at Monroe
Pamela Martin  
University of Louisiana at Monroe
Michael Broome  
University of Louisiana at Monroe

270
The Art of Questioning: Leading Learners to Level Up
9–12 Gallery Workshop

“Questions are the waypoints on the path of wisdom”—Grant Lichtman. This session will focus on the art of questioning and formative assessment tools. Work on becoming a falconer, leading your learners to level up through questions rather than lectures. Enhance/model practical classroom formative assessments that naturally offer differentiation.

Jill L. Gough  
Trinity School, Atlanta, Georgia
Jennifer C. Wilson  
Northwest Rankin High School, Flowood, Mississippi

210 A (BCEC)

271
From DI to D-All: Fun Differentiated Instruction Tasks for ALL!
6–8 Gallery Workshop

This highly participatory workshop will engage teachers in creative, real-world problems that allow for differentiation in content, process, and product. Come ready to receive a transfusion of math energy as we experience Common Core–aligned tasks and strategies that allow for the creation and implementation of a differentiated learning classroom.

Marcie Abramson  
Westwood Public Schools, Massachusetts

109 A/B (BCEC)
2:45 P.M.–4:00 P.M.

272
Take Action! Making “Formative Assessment” Formative
6–8 Gallery Workshop
Assessment data does little good, formatively, if you don’t act on what that data tells you. In this session, we’ll discuss Responsive Actions in formative assessment practices, including how to decide which is appropriate. Bring a laptop or tablet to participate in this interactive workshop—get some practical experience now!

Eric E. Karnowski
Education Development Center, Waltham, Massachusetts

273
Tasks That Build the Essential Understandings in Middle Grades Algebra
6–8 Gallery Workshop
The presenters, the authors of the forthcoming *Putting Essential Understanding of Expressions, Equations, and Functions into Practice in Grades 6–8*, will engage teachers in tasks designed to help students make sense of these key topics and develop strong algebraic reasoning. Teachers will work collaboratively and reflect on ways to promote problem solving and meaningful learning.

Zandra de Araujo
University of Missouri, Columbia
Barbara J. Dougherty
University of Missouri, Columbia
Fay Zenigami
University of Hawaii, Honolulu

274
Promote Reasoning and Sense Making with Free NCTM Online Resources
6–8 Gallery Workshop
Great teachers plus great (and free) technology equals maximized learning. Illuminate your classroom with game-filled lesson plans that supplement technology to engage students and promote the mastery of the mathematical practices.

Ann Kong
National Council of Teachers of Mathematics, Reston, Virginia
Sarah DeLeeuw
National Council of Teachers of Mathematics, Reston, Virginia

275
Statistical Significance: What Is It?
6–8 Gallery Workshop
Get ready to experience a task that shows how student expectations in statistics change as students move from middle into high school. Participants will engage in a hands-on activity that follows the progression of the CCSSM statistics standards. Leave the presentation with activities that are ready to be used immediately.

Jeff Ziegler
Brookhill Institute of Mathematics, Waukesha, Wisconsin
Sara Brown
Brookhill Institute of Mathematics, Waukesha, Wisconsin

276
Enriching Recursion Lessons with Activities
9–12 Gallery Workshop
When working with recursive equations, students often have difficulty understanding what can happen in the system and in predicting long-term behavior. In this session, participants will get to try out several hands-on activities to use in class that will improve student understanding of equilibrium in recursive systems.

Cheryl Gann
North Carolina School of Science and Mathematics, Durham

277
Exploring Motion in AP Calculus
9–12 Gallery Workshop
Participants will explore several interactive documents about motion on a line and motion in a plane. We will also explore some activities that lead to the discovery of some of the relationships between position, velocity, and acceleration. Several released AP free-response questions on the topic of motion will be presented.

Vicki M. Carter
West Florence High School, Florence, South Carolina
Ben Hedrick
The College Board, Duluth, Georgia
2:45 P.M.—4:00 P.M.

278 Quadratic Functions Everywhere: Engaging Investigations to Develop Conceptual Understanding
9–12 Gallery Workshop
Learn hands-on, conceptual lessons to help students understand what a quadratic function is. Activities, such as Spoon Launcher, Rolling Hot Wheels, and Packing Seats on an Airplane will engage even the most reluctant of learners. Activities include focus on math practices and academic language support. Lessons you can use next week!

Karajean Hyde
University of California, Irvine
Kris Houston
University of California, Irvine
Janna Canzone
University of California, Irvine

279 A Hands-On Mathematics Function Activity Integrating Science Gas Laws
9–12 Gallery Workshop
President’s Series presentation
New ideas to integrate math and science support student learning. The hands-on activity uses inexpensive manipulatives (soda cans, plastic syringes) to development models for scientific gas laws. Topics covered: graphing, tables, independent/dependent variables, direct/indirect/inverse functions, dimensional analysis, domain, range, and problem solving.

Kathleen Cage Mittag
Retired, University of Texas at San Antonio
Gilbert Naizer
Texas A&M University-Commerce

280 Historical Geometric Constructions: Using Ruler, Compass, and the Mira
Preservice and In-Service Gallery Workshop
Participants will be introduced to the six basic geometric constructions, and then use ruler, compass, protractor, and the Mira as construction tools. Historical constructions will include Fermat’s point, the Euler line, the golden ratio and rectangle, Napoleon’s circle, Napoleon’s theorem, Feurbach circle, Simson line, DelGrande line, and golden triangle.

James Fulmer
University of Arkansas at Little Rock
Lianfang Lu
University of Arkansas at Little Rock

281 Structuring Problem Solving
Preservice and In-Service Gallery Workshop
Developing reasoning through problem solving is critical in helping all students become proficient mathematicians and creative thinkers with deep conceptual understandings across mathematics. This presentation will focus on understanding and creating problem-solving structures to support all students’ mathematical thinking.

Cory A. Bennett
Idaho State University, Pocatello

282 Moving Principles into Actions: Leading Change in Mathematics Programs
Pre-K–2 Session
In Principles to Actions, NCTM sets forth a vision to support the goal of ensuring the mathematical success of all students. This session introduces professional learning resources designed to support teachers and other stakeholders as they strive to achieve the vision outlined in the principles, with a particular emphasis the elementary grades.

Joanne Wells
Eclectic Middle School, Alabama
Francis (Skip) Fennell
Past President, National Council of Teachers of Mathematics; McDaniel College, Westminster, Maryland
Visit NCTM Central, located in the Exhibit Hall, to connect with others in the Networking Lounge, renew your membership, and shop the latest titles at the Bookstore!
**287**
**Ignite! We’ll Enlighten You and We’ll Make It Quick**

**General Interest Session**

What makes mathematics educators passionate? Join us and find out! Our ten mathematics educators light up the room with fresh ideas in math teaching and learning. Each speaker gets five minutes to talk about whatever ignites their passion, using twenty slides that auto advance every fifteen seconds whether they’re ready or not. Featuring Robert Berry, Peg Cagle, Rafranz Davis, Annie Fetter, Darshan Jain, Dan Meyer, Eric Milou, Max Ray, Robyn Silbey and Ellie Terry. Emcee’d by NCTM President Diane Briars. Facilitated by Suzanne Alejandre and Stephen Weimar from The Math Forum @ Drexel.

Suzanne Alejandre  
The Math Forum @ Drexel, Philadelphia, Pennsylvania
Stephen Weimar  
The Math Forum @ Drexel, Philadelphia, Pennsylvania

**BALLROOM EAST (BEC)**

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**288**
**Partnerships to Build Collaboration and Leadership to Support Change**

**General Interest Session**

*Principles to Actions* (NCTM 2014) is basically a “call to action” for all professionals. This session explores professionalism. How do we support increased professionalism? This session provides examples and resources for sustainable and collaborative support for principals, coaches, teachers, and veteran leaders to increase student learning and understanding.

Carol Mueller  
Alabama Math, Science, and Technology Initiative (AMSTI) at the University of Alabama in Huntsville
Anne Knowlton  
Morgan County Schools, Decatur, Alabama

**GRAND BALLROOM D (WESTIN)**

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**288.1**
**The Nation’s Report Card Digital Tool Box: Mathematics Results and Resources**

**General Interest Session**

Join us for a lively tutorial on the latest National Assessment of Educational Progress (NAEP) online tools. Learn to navigate decades of math data from this U.S. Department of Education assessment. Compare state and national results, examine how classroom factors relate to achievement, and discover new ways to use NAEP questions. Laptops encouraged!

Hillary Marder  
Hager Sharp, Washington, D.C.
Robert Serna  
Hager Sharp, Washington, D.C.
Ashley Parker  
Hager Sharp, Washington, D.C.

**258 A (BEC)**

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**289**
**Standards for Mathematical Practices: Engaging English Learners in Mathematical Meaning-Making**

**Research Session**

Discussion of NSF-funded research to develop teaching strategies that simultaneously support ELLs’ language development and mathematical meaning-making through engagement in mathematical discourse focused on the key practices of argumentation, attention to precision, and expression of regularity in repeated reasoning.

Rita MacDonald  
Wisconsin Center for Education Research, Madison
Nora Ramirez  
Nora G. Ramirez Consulting, Tempe, Arizona
Sarah Lord  
University of Wisconsin–Madison

**252 B (BEC)**
290 TL
The ART of Teaching Mathematics: Know Thy Impact!
General Interest Session
Teacher Know Thy Impact. What does this mean? What do we know are the most essential elements of your daily work, and actions that maximize student learning in your classroom? In this motivational and inspiring session, we will examine several of the primary researched affirmed teacher beliefs and behaviors that impact student learning!
Timothy D. Kanold
Loyola University, Chicago, Illinois
210 B (BCEC)

291
Young Mathematicians at Work: Taking the CCSS SMPs Seriously
General Interest Session
In the Standards for Mathematical Practice, communication, representation, and problem solving have been elevated from processes to outcomes. This session will examine what teachers need to know about these outcomes and what reforms must be in place to prepare both children and teachers for successfully meeting these outcomes. Catherine Twomey Fosnot
New Perspectives on Learning, New London, Connecticut
BALLROOM WEST (BCEC)

292
Examining the Effectiveness of iPad Apps in Early Childhood Settings
Research Session
We will share the results and discuss the implications of two studies conducted at a HeadStart center. The first study focused on how students interacted with a series of researcher-created mathematics apps. The second study compared the achievement of students using these apps with students that used the best-reviewed early childhood math apps.
Jeffrey C. Shih
University of Nevada, Las Vegas
Amy Adkins
University of Nevada, Las Vegas
Charles Allen
University of Nevada, Las Vegas
104 C (BCEC)

293
When a Line Bends . . . Mathematical Discourse Begins!
Pre-K–2 Session
What happens when a line bends? A shape begins! In this session we explore how to utilize mathematical discourse to enhance student understanding of mathematical concepts. From construction of the social environment to pedagogical considerations, we tackle the geometry standards through discourse, children’s literature, and innovative activities.
Mary E. Baker
University of North Dakota, Grand Forks
106 (BCEC)

294
Blurring the Lines between Instruction and Assessment
Pre-K–2 Session
Formative assessment in primary mathematics classrooms is an exciting yet often misunderstood idea. The presenter will share research-based strategies for implementing formative assessment and will explore the salient mathematical ideas in the K–3 Common Core State Standards through the use of video clips and analyzing student thinking.
Zachary Champagne
Florida Center for Research in Science, Technology, Engineering, and Mathematics (FCR-STEM), Tallahassee
DOUGLASS (WESTIN)

295 EQ
Closing the Gap: Supporting Females in Problem Solving
3–5 Session
Despite girls’ gains in mathematics performance, gender disparities persist—with girls displaying weakness in problem solving. This session presents research on gender differences on strategy use and strategy preferences in routine and nonroutine word problems. Teaching strategies, activities, and resources for supporting girls are provided.
Stephanie Vega
University of Nevada, Reno
Heather Crawford-Ferre
University of Nevada, Reno
207 (BCEC)
3:30 P.M.—4:30 P.M.

**296**
**Solve It! Using a “Structured” Approach to Problem Solving**

Pre-K–2 Session

Explore strategies that support students as they learn to solve word problems. This session will focus on how to implement problem structures in teaching elementary students to solve addition and subtraction word problems through the use of schema-based instruction. Participants will engage in activities that can be incorporated immediately.

Kristin E. Harbour  
University of Louisville, Kentucky

Amy Lingo  
University of Louisville, Kentucky

Amy Hoskins  
Clear Creek Elementary School, Shelbyville, Kentucky

**297**
**Math, the “Write” Stuff: Incorporating Writing into the Mathematics Curriculum**

3–5 Session

There is more to math than just the “correct” answer. Students can express themselves through writing within the mathematics curriculum. Participants will be given the tools they need to guide their students through the process of transforming into mathematical thinkers who can express themselves not only through calculations, but also through words.

Kirsten Melise LeBlanc  
St. Paul on the Lake Catholic School, Grosse Pointe Farms, Michigan

**298**
**The Fractabulous Number Line**

3–5 Session

Explore models of multiplication and division of fractions using the number line as a manipulative. Join us and experience activities to help students visualize and build conceptual understanding of these operations, and why the algorithms work the way they do. Come ready for folding fun!

Heather A. Coughlin  
California State University, Stanislaus, Turlock

Bjorg Johannsdottir  
California State University, Stanislaus, Turlock

**299**
**Use Engaging Problem-Solving Tasks to Improve Student Understanding**

3–5 Session

Encourage students to explore, collaborate, and write about their math ideas within math learning communities. Provide math tasks that promote critical problem solving, reasoning, and math understanding. Ask good questions to promote thinking and to motivate students. Include realistic application problems that are relevant to the students.

Edna F. Bazik  
National Louis University, Chicago, Illinois

**300**
**Problem Strings: A Lesson Format for All Students**

6–8 Session

A problem string is a powerful lesson format where all students learn, have access to the problems, and are challenged. The success hinges on the order, the discussion, and the teacher modeling student strategies to build connections. Come experience strings of problems such as solving proportions, graphing linear functions, and solving equations.

Pamela Weber Harris  
University of Texas, Austin

Pick-up a copy of the onsite *Daily News* for up-to-date conference information!
3:30 P.M.—4:30 P.M.

301 Using MTMS in the Classroom
6–8 Session
This presentation is designed to provide ideas and guidance for teachers on how to use MTMS as an instructional tool in the classroom. Both feature articles and departments will be showcased. Participants will find valuable ideas as well as information on how to become actively involved in MTMS either as a reviewer or author.

Anthony Fernandes
UNC Charlotte, North Carolina
259 A (BCEC)

302 Authentic Learning through Computer Coding: Turning Consumers into Creators
6–8 Session
If your students like to innovate, model, tinker, and share, they will love coding for authentic learning in math. Take them beyond “The Hour of Code.” Learn how programming projects are set up as performance assessments aligned to CCSSM. Explore tools and project ideas, and hear student voices on growth, confidence, and interest in STEM.

Dawn DuPriest
Preston Middle School, Poudre School District, Fort Collins, Colorado
157 A (BCEC)

6–8 Session
Two big shifts introduced in the Common Core State Standards are a transformations-based approach to geometry and a comprehensive treatment of statistics. See how to bring these topics to life in your classroom with digital math tools that build student intuition and promote a deep conceptual understanding.

Erik Johnson
Amplify, Durham, North Carolina
Blake Whitley
North Carolina State University, Raleigh
255 (BCEC)

304 Finding the Write Answer: Deepening Mathematics Learning through Writing
9–12 Session
Writing can support and enhance mathematics learning—and is essential to full implementation of the Common Core math standards. The Common Core literacy standards provide a framework for effective writing-in-mathematics practices. We will use the literacy standards to develop lessons and assignments that integrate writing and mathematics to support deeper learning.

Polina Sabinin
Bridgewater State University, Massachusetts
Rebecca Steinitz
Education Consultant, Arlington, Massachusetts
154 (BCEC)

305 Mathematical Modeling in Abu Dhabi: Architecture, Design, and Mathematics
9–12 Session
We will examine mathematical models and activities related to astonishing buildings in Abu Dhabi, including one that responds to sunlight and another in the shape of a circle. We will discuss connections between the grades 7–12 mathematics curriculum, architecture, and design and how mathematical modeling can be done with buildings anywhere in the world.

Ron Lancaster
Ontario Institute for Studies in Education of the University of Toronto, Canada
254 A/B (BCEC)

306 Even the Weird Kids Have Parents
9–12 Session
Every continuous function is the derivative of another function. Even the ones that are not listed in a table of basic antiderivatives! We can integrate some derivatives, we can analyze the graphs of some derivatives, and we can use technology to help us define function values for other derivatives.

Anthony Griffith
Westminster School, Simsbury, Connecticut
Peter Doucette
Westminster School, Simsbury, Connecticut
209 (BCEC)
307
Using Binomial and Geometric Distributions to Make Real-World Decisions
9–12 Session
Many decision-making contexts involve uncertainty about some aspect of the decision. Often a probability distribution can be used to model this uncertainty. Participants will learn how to use the binomial or geometric distributions as well as simulation to make real-world decisions that involve choosing a proper balance of risk and reward.

Kenneth R. Chelst
Wayne State University, Detroit, Michigan
Angela Principato
South Lake High School, St. Claire Shores, Michigan

308
Examining the Mathematics Identities of African American Male Preservice Teachers
Preservice and In-Service Session
It is critical to analyze the mathematics experiences of African American male preservice teachers in order to inform efforts to diversify the nation’s teaching force. This work examines their evolving mathematics identities as they develop the mathematics knowledge needed for effective teaching. Factors that promote their success are identified.

Delayne Y. Johnson
Delaware State University, Dover

309
Promoting Teacher Professional Growth through Lesson Study
Preservice and In-Service Session
Two main aspects of Lesson Study are task design and careful examination of students’ anticipated and actual solutions in a collaborative environment. This session is based on Lesson Study programs in two Philippine schools. We will highlight the teachers’ dissection of two tasks and student solutions.

Marlon C. Ebaeguin
Melbourne Graduate School of Education, University of Melbourne, Victoria, Australia
Walter M. Stephens
Melbourne Graduate School of Education, University of Melbourne, Victoria, Australia

309.1
Got Number Sense?
Pre-K–2 Exhibitor Workshop
Do your students enter your classrooms with a foundation in number sense? As educators, we need to be able to recognize when students do no have foundational skills and use best practices proven to work for students struggling in math. This workshop will provide strategies for motivating, engaging, and accelerating student learning.

McGraw-Hill Education
Columbus, Ohio

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University of New Hampshire
Mathematics & Statistics
3:30 P.M.–4:30 P.M.

**309.2**  
Personal Math Trainer--Monitoring Assessments with Targeted Homework Support  
Pre-K–12 Exhibitor Workshop  
The Personal Math Trainer, powered by Knewton, is the ultimate assessment and personalized learning system for your students. Find out how this unique program is incorporated into the daily curriculum through assessment, practice, adaptive intervention and enrichment; tracking; reporting; and grading.  
Houghton Mifflin Harcourt  
Boston, Massachusetts  

309.3  
We Can’t Teach To The Test? Then Let’s Teach Math!  
3–5 Exhibitor Workshop  
New Common Core assessments represent a novel attempt to create tests that cannot be “taught to.” With students required to solve truly challenging problems, how will problem solving be taught systematically? Come see Reasoning Mind’s blended and personalized learning program that prepares students for the new generation of Common Core assessments.  
Reasoning Mind  
Houston, Texas  

309.4  
Motivating Your Math Students in 5 Easy Steps  
6–8 Exhibitor Workshop  
The editors of Scholastic DynaMath and MATH magazines share their tricks for making math irresistibly fun and interesting with exciting real-world examples. We’ll give you strategies for building your students’ mathematical confidence and appreciation—the basis for lifelong success in math.  
Scholastic, Inc.  
New York, New York  

5:00 P.M.–6:00 P.M.

**309.5**  
CME Project: Pearson’s NSF Curriculum for High School Math  
9–12 Exhibitor Workshop  
Learn how the CME Project curriculum provides a world-class math solution for teaching high school math in the Common Core era. Explore two of the program’s key principles—mathematical habits of mind and experience before formalization—via hands-on activities that offer a glimpse of what students experience in a CME Project classroom.  
Pearson  
Upper Saddle River, New Jersey  

**309.6**  
Pushing the Limits for Success  
9–12 Exhibitor Workshop  
Nationally recognized author Daniel Kennedy will lead a session on building and sustaining conceptual understanding in Precalculus and AP® Calculus classrooms. Learn ways to foster mathematical discovery, problem solving, and truly prepare students for college-level math courses.  
Pearson  
Upper Saddle River, New Jersey  

**309.7**  
Teachers as Designers: Mindset and Multidimensional Mathematics in Classrooms  
Preservice and In-Service Session  
I will consider what it means to teach the multidimensional mathematics needed in our high-tech world at the same time as instilling a growth mindset in all of our students. These changes have the potential to erase underachievement and inequality in classrooms, as well as giving teachers a more creative and fulfilling role in their work as educators.  
Jo Boaler  
Stanford University, California
Building a Bridge to Student Success

Join your peers in San Francisco at the country’s leading math education event, where NCTM brings together thousands of education professionals to spur the exchange of ideas, present innovations in mathematics teaching, and drive quality learning practices that benefit you and your students.

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Transition to Algebra is a classroom resource that approaches algebra instruction differently. Instead of reteaching the same algebra curriculum in the same way to struggling students, Transition to Algebra uses logic puzzles, problems, and explorations to uniquely build essential algebraic understanding. It invites students to experience the clarity of mathematics—perhaps for the first time. Visit TransitiontoAlgebra.com for samples, resources, and video clips.

“Building strong mathematical habits of mind in students is a way of bringing coherence and meaning to mathematics. Students learn that they can use their experiences to build habits—ways of thinking about and approaching problems.” —E. Paul Goldenberg, June Mark, Jane M. Kang, Mary K. Fries, Cynthia J. Carter, and Tracy Cordner

Making Sense of Algebra debunks the common misconception that algebra is simply a collection of rules to know and follow by delving into how we think about mathematics. This “habits of mind” approach is concerned not just with the results of mathematical thinking, but with how mathematically proficient students do that thinking.


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### Highlights
- Iris M. Carl Equity Address (Presentation 419)
- NCTM Business Meeting (Presentation 471)
- NCTM Past President’s Address (Presentation 533)
- New Teacher Celebration (Presentation 605)

### Icon Presentation Numbers

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### Registration Hours
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### Exhibit Hours
8:00 a.m.–5:00 p.m.

### NCTM Central/Bookstore 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.
8:00 A.M.–9:00 A.M.

310  NT
Using Students’ Thinking to Drive Mathematical Discussions and Optimize Learning
9–12 Session
This presentation engages you in making decisions about how to use student thinking to optimize mathematics learning. You will collaborate with colleagues to engage in Smith and Stein’s Five Practices: anticipating, monitoring, selecting, sequencing, and connecting student work to support rich mathematical discussions.

Erin R. Moss  
Millersville University, Pennsylvania

Tyrone Washington  
Millersville University, Pennsylvania

259 A (BCEC)

311  How Do Your Materials Rate? Improving Alignment to Common Core
General Interest Session
At a time when everything boasts alignment, we must be educated consumers about materials we choose. Learn about materials alignment based on CCSSM and how to evaluate materials for quality. Guidance will be given about purchasing new materials, reviewing existing materials, and how teachers can shore up weaknesses in adopted materials.

Jason Zimba was a lead writer of the Common Core State Standards for Mathematics and is a Founding Partner of Student Achievement Partners. He holds a M.Sc. by research in mathematics from the University of Oxford and a Ph.D. in mathematical physics from the University of California at Berkeley. His research fields have included astronomy, astrophysics theoretical physics, philosophy of science, and pure mathematics. He is the author of Force and Motion: An Illustrated Guide to Newton’s Laws. As an educator, he has taught physics, mathematics, and other subjects to college students, adult prison inmates, and disadvantaged high school students.

Jason Zimba  
Student Achievement Partners, New York, New York

Beth Beth Cocuzza  
Student Achievement Partners, New York, New York

259 A (BCEC)

312  Models to Solve Word Problems: Visualization to See Mathematical Relationships
General Interest Session
Students struggle with word problems whether in elementary grades with a variety of whole number and fraction operations or the middle grades with ratio, proportion, and algebraic problems. This session will demonstrate the power of visual models to help students see mathematical relationships and solve even complex problems and applications.

Andy Clark  
Retired, Portland Public Schools, Oregon

GRAND BALLROOM A (WESTIN)

313  IM
The Next Generation Science Standards and Mathematics
General Interest Session
The Next Generation Science Standards (NGSS) were completed in April of 2013. This informational session will provide updates on state adoption and implementation of the NGSS and implications for K–12 science and mathematics classrooms.

Stephen L. Pruitt  
Achieve, Washington, D.C.

BALLROOM WEST (BCEC)

314  Developing and Assessing Children’s Algebraic Thinking Using Patterns
Pre-K–2 Session
In this session, participants will explore common resources and activities for teaching algebra in early childhood mathematics, with a focus on the Common Core State Standards. Participants will discover innovative approaches and activities to help children develop deep understanding of the term “pattern” as connoting predictability.

Ernest Pratt  
University of Mount Union, Alliance, Ohio

154 (BCEC)
8:00 A.M.–9:00 A.M.

315  
**Teaching Number Sense Concepts with Number Line Routines**  
Research Session

Number line routines enable students to extend their understanding of number and to develop solid conceptual foundations to increase mathematics proficiency. We describe the theory guiding development of the routines, present data from our work with a teacher review team, and provide opportunities for participants to practice using the routines.

Dawn M. Woods  
Southern Methodist University, Dallas, Texas  
Deni Basaraba  
Southern Methodist University, Dallas, Texas  
Leanne Ketterlin Geller  
Southern Methodist University, Dallas, Texas

316  
**All Included in Math: Promoting Effective Mathematical Discourse for All**  
Pre-K–2 Session

Students can no longer get by with just knowing the answer. They need to be able to explain their own ideas and critique the ideas of others. We will look at how to make discourse strategies accessible to all students, utilizing effective literacy strategies and adapting them to be successful in the math classroom.

Sidney Fox  
North Carolina State University, Raleigh

317  
**Fractions Are Amazing Numbers!**  
3–5 Session

When students explore the number line, they begin to see what exists between whole numbers. Fractions are an integral component of building numerical reasoning, problem solving, and communication. This session focuses on enhancing students’ understanding of fractions by engaging them in discussions and tasks about why fractions are amazing!

John T. Neral  
American Institutes for Research, Washington, D.C.

318  
**From Expressionism to Pop Art: Exploring Mathematics through Visual Arts**  
3–5 Session

Explore geometry and measurement concepts as well as proportional reasoning using the artwork of Piet Mondrian, Pablo Picasso, Josef Albers, Jasper Johns, and Andy Warhol. Connect children’s literature that features the visual arts to math concepts.

Jennifer L. Albritton  
All Saints’ Episcopal School, Fort Worth, Texas  
Annabelle G. Gallo  
All Saints’ Episcopal School, Fort Worth, Texas  
Vanessa Morales  
All Saints’ Episcopal School, Fort Worth, Texas

319  
**The Common Core in Uncommon Classrooms: Strategies for Success**  
3–5 Session

The presentation will focus on specific instructional strategies for ensuing success for English language learners, students from diverse backgrounds and others who struggle in the mathematics classroom. Classroom-ready culturally relevant resources both online and in print will be shared.

Dolores T. Burton  
Retired, New York Institute of Technology, Old Westbury

320  
**Magnitude of Whole Numbers and Fractions on the Number Line**  
3–5 Session

Learn how to help students effectively use the number line to round whole numbers, reinforce the understanding of fractions as numbers, deepen understanding of magnitude, and make comparisons. Strategies for addressing the Common Core content and practice standards along with free online tools will be presented.

Lauri Susi  
Conceptua Math, LLC, Petaluma, California  
Julie McNamara  
University of Michigan, Ann Arbor  
Arjan Khalsa  
Conceptua Math, Petaluma, California
321
Singapore’s Model Drawing Approach with a “Units” Sentence
Preservice and In-Service Session
The Singapore model drawing approach can be used to solve a variety of word problems, but its true power lies in the way the process provides a bridge to algebraic thinking and techniques. I will show how a “units” sentence can be used to solve problems with diagrams, and how this idea transitions to purely algebraic solutions.

Michael Winders
Worcester State University, Massachusetts

322
Exploring Mathematics Items, Results, and Contextual Information from TIMSS
Research Session
The session will be an introduction to TIMSS 2011 math assessment, including (1) an exploration of assessment items at the Dare-to-Compare website, and (2) an investigation of student performance in math and contextual data through a demonstration of the International Data Explorer (IDE). Both of these are publicly available, free web tools (see http://nces.ed.gov/).

Lydia B. Malley
American Institutes for Research, Washington, D.C.
Sharlyn M. Ferguson
American Institutes for Research, Washington, D.C.

323
Breaking the Pattern of Academic Failure through Intervention
6–8 Session
I did it—so can you! Join me while I share my journey as a middle school RtI leader. By building classroom culture, focusing on whole student approaches, utilizing research-based instruction, and developing schoolwide methods I was able to meet the needs of my highly diverse students.

Brittany L. Horton
North Middle School, Rapid City Area Schools, Rapid City, South Dakota

324
Four Essential Elements of RtI From a Middle Schooler’s Perspective
6–8 Session
You are the student. We are the teachers. Walk through the four essential elements of successful middle school RtI programs. Take a pre-test, make decisions, engage in explicit instruction using manipulatives within the C-R-A process and conclude with progress monitoring. All activities emphasize the CCSS practice standards for fractions.

Sonja L. Goerdt
St. Cloud State University, Minnesota
Caryl K. Pierson
Math Teachers Press, Inc., Minneapolis, Minnesota

325
Implementing the Math Practice Standards and Promoting Math Discourse
6–8 Session
Students benefit from productive discourse in math. We will share strategies which incorporate practice standards and examples for grades 6–8 content: sticky note warmup, critique sheet, 4 color card matching, philosophical chairs, Socratic circles, and jigsaws. Leave with activities to use in your classroom on Monday.

Shannon Molt
USD 475-Geary County Schools, Junction City, Kansas
Pamela Dombrowski
USD475-Geary County School District, Junction City, Kansas

325.1
Essential Knowledge for Effective Teaching and Learning of Statistics
General Interest Session
The Common Core State Standards and other state standards emphasize statistics, particularly in grades 6-12. Effective implementation depends on teachers’ work in the classroom. This session presents the Statistics Education of Teachers recommendations, including the Mathematics Practice Standards under a statistical lens and grade-band examples illustrating the statistical thinking process.

Anna Bargagliotti
Loyola Marymount University, Los Angeles, California
### 326 Inquiry Mathematics with Students with Special Needs

**6–8 Session**

Inquiry mathematics has become highly regarded as a teaching approach for supporting students’ critical thinking. However, many teachers and researchers question whether this approach is applicable with students with special needs. In this session, we examine this concern by exploring the practices of two inquiry co-teachers and their students.

Michelle Stephan  
UNC Charlotte, North Carolina  

Julie Cline  
C.C. Griffin Middle School, Concord, North Carolina  

Erica Allred  
C.C. Griffin Middle School, Concord, North Carolina

#### 210 B (BCEC)

### 327 Strategies for Differentiating Instruction

**6–8 Session**

With the increase in content demand of CCSSM, a greater need to differentiate instruction without lowering the demands of high-level tasks exists. Examples of five strategies for differentiating instruction will be shared and the benefit of each strategy will be considered.

Victoria L. Bill  
Institute for Learning, University of Pittsburgh, Pennsylvania

#### 253 B (BCEC)

### 328 Tasks Supporting English Learners in Mathematical Reasoning and Communication

**6–8 Session**

Analyzing worked examples, or sampling correct, incorrect, and/or incomplete solutions, can support learning of mathematical concepts, problem-solving transfer, and knowledge of problem-solving strategies. Worked examples support English language learners in particular by providing scaffolded opportunities for mathematical reasoning and communication.

Mark J. Driscoll  
EDC, Inc., Waltham, Massachusetts

#### 252 B (BCEC)

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### Building Student Understanding of the Mathematical Practices through IN-formative Assessment

**9–12 Session**

Come learn how to recognize and advance your students’ understanding and use of the Standards for Mathematical Practice from CCSSM. EDC will share the first draft of several formative assessment experiences we are developing. These lessons focus on algebra 1 content, but could be used at several grade levels, including 7–11.

Matt McLeod  
Education Development Center (EDC), Chicago, Illinois  

Al Cuoco  
Education Development Center, Inc., Waltham, Massachusetts  

Eden Badertscher  
Education Development Center, Inc., Waltham, Massachusetts

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[ecampus.unk.edu](http://ecampus.unk.edu)
330 High-Yield Geometry Routines
6–8 Session
President’s Series presentation
Explore a few key activities that can serve as class openers to facilitate students’ developing their spatial sense, geometric vocabulary, and understanding of foundational geometric concepts throughout the school year. Participants will engage in several high-yield geometry routines and discuss connections to the CCSS mathematical practices.
Juliana Utley
Oklahoma State University, Stillwater

331 Assessing Your Assessments: The Next Phase of CCSSM Implementation
9–12 Session
What makes a great assessment? High-quality assessment practices can inform both teachers and students on the progression of learning the content and process standards. Come experience “high-quality assessment processes” that exemplify the focus, coherence, and rigor of CCSSM. Analyze student work to learn how to guide further instruction.
Adrienne Wooten
Deer Valley Unified School District, Phoenix, Arizona
Mona Toncheff
NCSM Regional Director Western Region 1; Phoenix Union High School District, Phoenix, Arizona

332 Modeling the Cycloid: From Geometry to Calculus
9–12 Session
Engage your students in the modeling process by exploring data that represents the motion of a cycloid. We will demonstrate how to capture the data from a video and illustrate the geometric underpinnings that verify the model. Data will be shared in various formats along with a GeoGebra file that connects the algebraic and geometric concepts.
Maria L. Hernandez
North Carolina School of Science and Mathematics, Durham
Taylor Gibson
North Carolina School of Science and Mathematics, Durham

333 Taxi Cab Geometry Solves Real Problems
9–12 Session
The fundamentals of Taxi Cab geometry will be presented and compared to Euclidean geometry. Some people view Taxi Cab geometry as interesting, but not realistic or practical. We will look at application problems and compare Euclidean solutions to Taxi Cab solutions and see that Taxi Cab solutions are actually more realistic and practical.
Glen W. Richgels
Bemidji State University, Bemidji, Minnesota
Amber R. Severson
Anoka-Ramsey Community College, Cambridge, Minnesota

334 Using Student Choice and Self-Assessment to Increase Success for All
9–12 Session
Too often we hear the frustrated call—“I just don’t understand any of this!” Come and learn effective strategies for training students to articulate their confusions about mathematical concepts and for differentiating developmentally appropriate challenges. Help your students build confidence and learn to communicate mathematically.
Carolyn Briles
Stone Bridge High School, Loudoun County Public Schools, Ashburn, Virginia
Connie S. Schrock
Emporia State University, Kansas

Visit NCTM Central, located in the Exhibit Hall, to connect with others in the Networking Lounge, renew your membership, and shop the latest titles at the Bookstore!
8:00 A.M.–9:00 A.M.

335

**Authentic Contexts in College Mathematics Learning**

*Higher Education Session*

Authenticity is a familiar term in education, but what does it mean? Participants will be provided with a framework for (1) determining task authenticity, (2) building new authentic learning activities, and (3) introducing authentic learning activities into college courses. Examples from precalculus algebra and statistics courses will be provided.

Lauretta Garrett  
Tuskegee University, Tuskegee Institute, Alabama  
Maria Calhoun Charleton  
Tuskegee University, Tuskegee Institute, Alabama  
Li Huang  
Tuskegee University, Tuskegee Institute, Alabama

**DOUGLASS (WESTIN)**

336

**iPads = iReflect. How iPads Changed My Math Methods Class**

*Higher Education Session*

Learn how tablets helped create an environment of reflection and growth while illustrating the Mathematics Teaching Practices in *Principles to Actions*. Integration of applications, field-based assignments, and assessment ideas will be discussed. Participants will leave with a wealth of ideas and possibilities to improve the self-reflection process for teachers.

Jeanine L. Haistings  
William Jewell College, Liberty, Missouri

**207 (BCEC)**

336.1

**Notebook Foldables—When You’re No Longer a Novice**

*General Interest Exhibitor Workshop*

Have you mastered the basics of Notebook Foldables? Discover more folds to move students to the next level of interactive notebooking. Cut, fold, and more as you create your own mini composition book filled with ideas ready for immediate application.

Dinah-Might Adventures  
San Antonio, Texas

**105 (BCEC)**

336.2

**A Look at enVisionmath2.0 from a Teacher and Author Perspective**

*(Pre-K–5) Exhibitor Workshop*

Learn how key issues like content organization, problem-based learning, visual learning, rigor, and assessment impacted the development of the new enVisionmath2.0 program, and see how it supports student learning.

Pearson  
Upper Saddle River, New Jersey

**151A (BCEC)**

336.3

**Extra Practice with Go Math! Academy**

*Pre-K–8 Exhibitor Workshop*

Get families involved in student learning with GO Math! Academy, an online at-home learning program that combines practice problems and help videos with games and rewards to make math both educational and fun. Learn how kids can work independently, getting extra practice and support to help build their skills and confidence in math.

Houghton Mifflin Harcourt  
Boston, Massachusetts

**151B (BCEC)**

336.4

**What Comes First? The Content or the Standards?**

*6–8 Exhibitor Workshop*

What should come first, the content or the standards? Apps that lead to student mastery are intentionally designed, not just aligned, to the standards. Using Buzzmath, we will investigate how deliberate design choices make it easy for teachers to enhance learning, perseverance, independence, and tailored learning experiences for their students.

Scolab, Inc.  
Montreal, Quebec, Canada

**153A (BCEC)**
8:00 A.M.–9:00 A.M.

336.5 EW Five Teaching Practices that Inspire STEM Careers
3–5 Exhibitor Workshop
Research makes the case for getting students ready for Algebra and starting early. How can we nurture a love of mathematics and fill the ranks of STEM careers? This workshop will present an overview of easy-to-implement, teaching practices that build skill proficiency, deepen conceptual understanding, and inspire confidence for mathematics.

Think Through Math
Pittsburgh, Pennsylvania

336.6 EW Transform Teaching and Learning with MathXL® for School
9–12 Exhibitor Workshop
Through online personalized learning, MathXL® for School allows middle and high school teachers to focus on important aspects of teaching, while students receive an individualized learning experience with immediate feedback, interactive learning aids, and lots of practice. NEW! Mobile compatibility!

Pearson
Upper Saddle River, New Jersey

8:00 A.M.–9:15 A.M.

337 Effective Instructional Strategies for Building Understanding of Addition and Subtraction
Pre-K–2 Gallery Workshop
Children’s work with early number operations is essential for developing operational understanding. Participants in this session will examine instructional strategies and student work with the goal of understanding how student reasoning of addition and subtraction builds in K–2.

Kathleen Lynch-Davis
Appalachian State University, Boone, North Carolina
Chystal Dean
Appalachian State University, Boone, North Carolina
Tracy Goodson-Espy
Appalachian State University, Boone, North Carolina

338 Using Natural Materials to Enhance Critical Thinking Skills
Pre-K–2 Gallery Workshop
Nature is unique in that nothing is perfectly shaped or colored, thus providing children with a platform for being creative in thought, rich in language, and excited about learning. This presentation will focus on how the use of natural materials as manipulatives provides richer mathematical experiences and enhances critical thinking skills.

Bonnie B. Ripstein
Henry Barnard Laboratory School, Rhode Island College, Providence
Elizabeth Orton
Henry Barnard Laboratory School, Rhode Island College, Providence

339 Using Rekenreks to Introduce and Develop Number Sense
Pre-K–2 Gallery Workshop
Rekenreks provide a visual model that students can use to discover number relationships and develop fluency. Through the use of this tool, students can generate a variety of addition and subtraction strategies. Participants will watch video of students working with rekenreks and identify important elements for planning and implementing a number talk.

Nina E. Smith
Marcy Open School, Minneapolis Public Schools, Minnesota
Nicole Kuhse
Marcy Open School, Minneapolis Public Schools, Minnesota

340 Developing and Assessing Addition Fact Fluency
Pre-K–2 Gallery Workshop
What does it really mean to be fluent with addition facts, and how is this idea reflected in CCSSM? Come explore how we can use strategies, games, and activities in meaningful ways to develop a trajectory for helping all students become fluent with addition facts, and consider ways to authentically assess fact fluency.

Gina Kling
Western Michigan University, Kalamazoo
Jennifer M. Bay-Williams
Board of Directors, National Council of Teachers of Mathematics; University of Louisville, Kentucky
Learn more about the importance of the development of a sense of number, with a particular focus on conceptual understanding, procedural fluency, and applications. At this Institute, you will—

- acquire instructional strategies that provide all students with an opportunity to develop a sense of number;
- determine the role of the Common Core’s Standards for Mathematical Practice as they impact number-related content domains and topics;
- increase your understanding of the mathematical content of the Common Core domains that emphasize number; and
- consider how Principles to Actions: Ensuring Mathematical Success for All can regularly affect your implementation of CCSSM as you consider access and equity, learning, teaching, curriculum, assessment, and your own professional development.

Visit [www.nctm.org/number](http://www.nctm.org/number) to learn more and register.
8:00 A.M.–9:15 A.M.

341
Improving Discourse in the Classroom: Fractions and Measurement
Pre-K–2 Gallery Workshop
This workshop will explore practices that promote mathematical discourse in the elementary classroom. Learning experiences with fractions and measurement will be used to actively engage workshop participants in firsthand use of these practices.

Monique C. Lynch
Walden University, Minneapolis, Minnesota
Mel Griffin
Walden University, Minneapolis, Minnesota

205 C (BCEC)

342
Making Sense of Problems: Transferrable Tools to Support All Learners
Preservice and In-Service Gallery Workshop
Participants will explore how they can make mathematics problem solving more accessible to children with diverse learning needs. They will investigate how context increases access to mathematics learning, use sense-making tools that support understanding across multiple grades, and make connections to the Standards for Mathematical Practice.

Andria Disney
University of Montana, Missoula

GRAND BALLROOM E (WESTIN)

343
Beyond the Algorithm: Building a Conceptual Understanding of Division
3–5 Gallery Workshop
Examine how arrays, place value disks, place value charts, number bonds, area models, and tape diagrams are used to build understanding. Discover how each model brings division to life and leads students to success. Explore the progression of student learning and discover how to reach all students through multiple means and strategies.

Mary Jones
Common Core, Inc., Chateaugay, New York
Kelly Alsup
Common Core, Inc., Chicago, Illinois

156 C (BCEC)

344
Decimals: Models and Language That Build Understanding
3–5 Gallery Workshop
Decimal lessons that build meaning through experiences with multiple representations and connections among them are presented. These lessons include pictorial models, language, and symbols. Student work will highlight how these models build strong mental images that support students’ work with order, equivalences, and operations with decimals.

Debra Monson
University of St. Thomas, St. Paul, Minnesota
Kathleen Cramer
University of Minnesota, Minneapolis
Karen Colum
Minnesota State University, Mankato, Minnesota

206 A/B (BCEC)

345
Making Math Real: Unleashing the Power of the Practice Standards
3–5 Gallery Workshop
This hands-on workshop will engage participants in rich tasks that illuminate the Standards for Math Practice. While our focus will be on SMP 4, as we explore real-world problems through multimedia, participants will discover how many SMP’s are involved when solving meaningful problems. Participants will receive resources and activities.

Alison J. Mello
Foxborough Public Schools, Massachusetts

257 A/B (BCEC)

346
Representations with Tape Diagrams? What’s That?
3–5 Gallery Workshop
Tape diagrams help children to represent complex problems found in CCSSM testing. Bar models, in particular, work for all learners to make sense of complex word problems. This session will focus on how to lead children from beginning stages of whole number operations through fraction operation modeling from second up through sixth grades.

Deborah Rutherford Lane
Highline School District, Math Team Assistance, Seattle, Chehalis, Washington

204 A/B (BCEC)
8:00 A.M.–9:15 A.M.

**347** Standards for Mathematical Practice through Cooperative Tasks

3–5 Gallery Workshop

In this session, you will take part in activities that promote the Standards for Mathematical practice as they plunge into rich math tasks. You will be exposed to free resources and will leave this session with a plan of action to create a problem-solving focused classroom, with strategies you can use tomorrow for promoting multiple strategies.

Misha Freeman
Littleton Elementary School District, Avondale, Arizona

**348** Base-Ten Blocks to Beginning Algebra: Unifying Computational Algorithms

6–8 Gallery Workshop

Participants will extend conceptually-based computational models found in elementary school to beginning algebra by using base-ten blocks to develop algorithms used by elementary students and then using algebra tiles to develop the analogous algebraic algorithms.

Marvin E. Harrell
Emporia State University, Kansas
Nancy L. Smith
Emporia State University, Kansas
Tiffany Hill
Emporia State University, Kansas

**349** Divide and Conquer the Math Learner’s Brain

3–5 Gallery Workshop

Have you ever wondered how to link estimations with divisions? Have you ever hoped that your students could do long divisions mentally? In this session, we will break down divisions. We will explore how students can think about divisions in a way that links neuroscience to the classroom by building stronger connections in the brain.

Julie Lisa Roy
Anglophone East School District, Moncton, Canada

**350** I Can Do Centers Right: A Centers Model for Differentiation

3–5 Gallery Workshop

Knowledge of number and problem solving are key to mathematical success. Engage in an environment that promotes differentiation and reinforces and reinvests math concepts. Implementing a math workshop develops routines that foster cooperation and independence. We will share resources and strategies for implementation, accountability, and management.

Cheryl Cantin
Eastern Townships School Board, Magog, Canada
Rebecca Enright
Eastern Townships School Board, Magog, Canada

**351** Exploring Volume by Building Towers, Holding Popcorn, and Squishing Clay

6–8 Gallery Workshop

Join us for hands-on, manipulative-rich tasks focused on exploring volume. Participants will work collaboratively to develop understanding of volume of prisms through building towers, problem-solve while comparing volumes of cylinder popcorn holders, and squish clay to derive the volume formula of a sphere.

Samantha G. Briceno
Carnegie Learning, Pittsburgh, Pennsylvania
Kasey Bratcher
Carnegie Learning, Pittsburgh, Pennsylvania

**352** Extending Understandings from Whole Numbers to Rationals with Problem Sets

6–8 Gallery Workshop

CCSSM states that students apply and extend previous understandings of whole numbers to work with rational numbers. In this session, we will explore problem sets that establish a context for whole numbers and extend to integers, fractions, or decimals. Print and video cases of students working on such problems will be analyzed.

Deborah Schifter
EDC, Waltham, Massachusetts
Virginia Bastable
Mount Holyoke College, South Hadley, Massachusetts
8:00 A.M.–9:15 A.M.

353
Real-Life Math Investigations That Require Insight, Collaboration, and Creative Thinking
6–8 Gallery Workshop
Real-world scenarios/dilemmas that require insight, intuition, creativity, and collaboration to reach effective and accurate solutions. Students will simulate an engineering team as it searches for solutions, playing the roles of attorneys analyzing how statistics have been manipulated and journalists trying to determine whether the math is accurate in news articles.
Ed D. Zaccaro
Retired, Dubuque, Iowa

156 A/B (BCEC)

354
Combining Practice and Content Standards: Case Study of MP.7
6–8 Gallery Workshop
How are the Common Core practice and content standards related? How can teachers use existing materials to support both? We will consider these and related questions in the context of MP.7: “Look for and make use of structure.” We will also discuss what structure looks like in different courses, its importance, and what it means to make use of it.
Angela Knotts
WestEd, Redwood City, California
Katie Salguero
WestEd, Redwood City, California

253 A (BCEC)

355
Creatively Integrate CCSS, Questioning Techniques, Interactive Technologies, and Mathematically-Rich Engaging Problems
9–12 Gallery Workshop
Hands-on experience: three activities that promote active student engagement and are mapped to the mathematical practices and standards. Learn specific instructional strategies and obtain questioning techniques that stimulate deeper conceptual understanding. Discover, explore, investigate, and analyze with appropriate technology (iPad, handheld, software).
Tom Reardon
Youngstown State University, Ohio

210 C (BCEC)

356
Loads of Codes: Cryptography Activities for the Classroom
9–12 Gallery Workshop
Cryptography is the science of using mathematics to encrypt and decrypt data. In this workshop, we’ll look at the mathematics involved in a few systems over the years. We’ll study different types of systems that are based in algebra and a few others that require different types of reasoning and sense making to encrypt and decrypt.
Paul Kelley
Board of Directors, National Council of Teachers of Mathematics; Anoka High School, Anoka, Minnesota

252 A (BCEC)

357
A Better Approach to Teaching Radian Measure
9–12 Gallery Workshop
This workshop will give teachers great lessons and tools to teach students about radians. We’ll learn by rolling out radian number lines, building trig curves, doing measurement tasks, and examining radian angle measures in polygons. Teachers will be ready to teach the three radian Common Core standards, and they’ll get to keep the set of radian scale protractors!
Jennifer L. Silverman
Jensilvermath Consulting, Unionville, Connecticut

258 B (BCEC)

Receive a Free T-shirt—join or renew your NCTM membership on-site at the NCTM Member Services desk, located in NCTM Central in the Exhibit Hall.
8:00 A.M.–9:15 A.M.

358
Reasoning and Problem Solving in the Common Core Era
9–12 Gallery Workshop
NCTM’s Principles to Actions calls for teachers to “Implement tasks that promote reasoning and problem solving.” In this session, we identify problem solving and reasoning in Smarter Balanced and PARCC released items. We will explore ways to modify textbook tasks to draw out similar practices. Please come ready to share your strategies as well!

Tami S. Martin
Illinois State University, Normal
Roger P. Day
Illinois State University, Normal
Craig J. Cullen
Illinois State University, Normal

9:00 A.M.–10:15 A.M.

359
Transforming High School Mathematics through Transformations
9–12 Gallery Workshop
Investigate how transformations can be used as a unifying theme across the high school mathematics curriculum. Discuss and reflect how to effectively introduce transformations in both algebraic and geometric instruction. Activities developed for courses created as part of a university/school district collaboration will be shared.

Richard Parr
Rice University School Mathematics Project, Houston, Texas

10:30 A.M.–11:45 A.M.

360
Travel with M.C. Escher to Spain, Italy, Morocco, and Turkey
9–12 Gallery Workshop
Learn how the artist, M.C. Escher, transformed geometric tessellations into his unique prints. Photos of architectural tilings from Europe and Asia will be used to explain the geometry underlying his art. Learn how to construct triangular and square grids, stars, and Escher-like designs. Lots of handouts so you can bring this to your classroom!

Carol D. Desoe
SCARSDALE HIGH SCHOOL, NEW YORK 256 (BCEC)

361
Yawning Is Contagious? Testing for Significant Differences in Algebra 2
9–12 Gallery Workshop
CCSS S-IC.5 asks students to use simulations to evaluate if two treatments are significantly different. Using an episode of Mythbusters, we will explore simulations to challenge their conclusion about contagious yawns. Simulations will be performed using cards, calculators, and software. A variety of other contexts for simulations will be provided.

Jared E. Derksen
Chaffey Joint Union High School District, Rancho Cucamonga, California

361.1
Experimenting with Transformations in the Plane
9–12 Gallery Workshop
President’s Series presentation
Come explore how to engage students in explorations that scaffold learning of rigid motions in the coordinate plane using manipulatives and the TI-Nspire. In this session you will develop and use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure.

Christine D. Thomas
Georgia State University, Atlanta

11:30 A.M.–12:45 A.M.

362
Moving to Action: Effective Teaching Practices in the Middle Grades
6–8 Session
This session features the new (and free) NCTM materials to support and focus professional learning on the research-based teaching practices in Principles to Actions. Engage in analysis of effective mathematics teaching using video cases and resources from selected modules and then continue the conversation with colleagues back in your districts.

Mike Steele
University of Wisconsin–Milwaukee
Margaret Smith
University of Pittsburgh, Pennsylvania

12:30 P.M.–1:45 P.M.

363
Mathematics of Fractals
6–8 Session
Explore the mathematics of fractals and its applications. Learn about fractal geometry and its properties such as self-similarity and infinite detail. Use interactive tools to create fractals and investigate their properties.

Timothy D. Kanold
Stagg High School, Evanston, Illinois

2:00 P.M.–3:15 P.M.

364
Connecting the Classroom and the Curriculum
6–8 Session
This session explores how to connect the classroom and the curriculum by integrating real-world applications and problem-solving activities. Learn strategies for developing meaningful connections between the classroom and the broader curriculum.

Linda Henderson
Martha Stewart Projects, New York

365
Mathematics of Music
6–8 Session
Explore the mathematical concepts underlying music, such as rhythm, pitch, and harmony. Use interactive tools to create musical compositions and analyze their mathematical properties.

Susan J. O’Connor
Westfield High School, Westfield, Massachusetts
9:30 A.M.–10:30 A.M.

363  PS
Fake-World Math: When Mathematical Modeling Goes Wrong
General Interest Session
The presenter works with thousands of math educators every year and finds more disagreement about the CCSS modeling standard than any other. So let’s try to answer the questions: what is mathematical modeling, how does it go wrong, and how do we get it right?

Dan Meyer
Stanford University, California

BALLROOM WEST (BCEC)

364  EQ
Helping Girls Develop Spatial Skills through Art
General Interest Session
Girls tend to struggle with spatial skills, which can influence their performance in the STEM disciplines. Art is one effective medium for developing spatial skills. This session will provide instructional strategies, activities, and resources for helping girls (and boys!) develop spatial skills through multicultural art activities.

Lynda R. Wiest
University of Nevada, Reno
Tia L. Flores
Coral Academy of Science, Reno, Nevada

FANEUIL (WESTIN)

365  EQ
Inspiring Every Child
General Interest Session
Join me as I share an inspirational talk about my experience with students in my own classes that provided a springboard for them to believe in themselves and in their capacity to be successful as doers of mathematics. You will cry, laugh, and leave inspired to meet your own teaching challenges!

Kathryn L. Dillard
Borenson and Associates, Allentown, Pennsylvania

259 A (BCEC)

366
Reaching & Teaching “Those Kids”
General Interest Session
Nearly 100-percent pass rates are possible. Chris will show specific, practical, proven ways to enhance student learning and performance on the new standards. Improve student achievement by getting Demanding, Focused, Determined, and Excited.

Chris Shore
Temecula Valley Unified School District, California

258 A (BCEC)

367
Six Interesting Triangles: Pascal, Chinese, Harmonic, Euler, Prime, and Golden
General Interest Session
The Chinese knew Pascal’s triangle some 400 years before Pascal lived. Patterns continue to be discovered. This session will focus on six interesting triangles: Pascal, Chinese, Harmonic, Euler, Prime, and Golden. The history, similarities, differences, and patterns of each triangle will be discussed.

Lianfang Lu
University of Arkansas at Little Rock
James Fulmer
University of Arkansas at Little Rock

253 B (BCEC)

368
Stop Answering Questions!—Countering the Google Generation
General Interest Session
Our students come to class preprogrammed to receive instant answers to their math questions. Like a Google search, they expect us to provide a quick and simple answer. We will discuss how to improve student learning and achievement by not providing the neat, tidy answers they desire.

Jonathan M. Ail
SkyView Academy, Highlands Ranch, Colorado
Tiffany Howard
SkyView Academy, Highlands Ranch, Colorado

BALLROOM EAST (BCEC)
9:30 A.M.—10:30 A.M.

369  
Lessons Learned about Preschool Children’s Use of iPads  
Pre-K–2 Session  
The use of iPads in classrooms is becoming more prevalent. In this session, we will share what we have learned in the past two years about the implementation of iPads in a preschool setting. Early childhood mathematics apps, as well as the different ways that teachers integrate iPads to maximize learning, will be shared and discussed.

Amy Adkins  
University of Nevada, Las Vegas
Lina DeVaul  
University of Nevada, Las Vegas
Taro Ito  
University of Nevada, Las Vegas

153 C (BCEC)

370  
Tracing the Development of Counting and Patterns with Peg + Cat  
Pre-K–2 Session  
Using clips from PBS KIDS’ Peg + Cat, we will demonstrate a developmental progression of two early math concepts: counting and patterns. For example, we’ll see how counting involves knowing the number sequence, one-to-one correspondence, and cardinality, and how it builds to counting by 5s and 10s, and even to counting backwards.

Deborah Rosenfeld  
Education Development Center, New York, New York
Regan Vidiksis  
Education Development Center, New York, New York
Torie Gorges  
SRI International, Menlo Park, California

103 (BCEC)

372  
What Does It Take for Students to Understand Place Value?  
Pre-K–2 Session  
All students can understand place value concepts when teachers know: (1) the critical learning phases and learning trajectories students move through, (2) the kinds of activities that maximize children’s learning of place value concepts, (3) how to assess understanding, and (4) how to set up the classroom to meet the range of needs.

Kathy Richardson  
Math Perspectives Teacher Development Center, Bellingham, Washington

210 B (BCEC)

373  
From Noticing Regularity to Constructing Arguments in the Elementary Grades  
3–5 Session  
This talk focuses on the development of understanding the meanings and behaviors of the operations, with whole numbers and fractions, and how this content provides significant opportunities for engaging all students in CCSS mathematical practices 3, 6, and 8 in instruction. Participants will examine video examples from a range of classrooms.

Susan Jo Russell  
TERC, Cambridge, Massachusetts

205 B (BCEC)

374  
Modeling Fractions as Numbers  
3–5 Session  
Students must understand fractions as numbers and learn to perform computations involving fractions. Modeling fractions in rectangular area models and on the number line creates this understanding, forming an arc of continuity beginning with the introduction of fractions in third grade and extending to division of fractions at the end of fifth.

M. W. Penn  
Author, Hamden, Connecticut

161 (BCEC)

Create your personal scheduling using the online conference planner by visiting www.nctm.org/planner
9:30 A.M.–10:30 A.M.

375
Without the Algorithms: Solving Fraction Problems Conceptually
Preservice and In-Service Session
You can’t do that! Teacher candidates enter elementary mathematics methods with beliefs and procedural content knowledge. Many lack a conceptual lens. This session will focus on teaching teacher candidates to approach fraction problems conceptually. Their performance final from Elementary Mathematics Methods will be the highlight of the session.

Stefanie D. Livers
University of Alabama, Tuscaloosa
Nicolette Nalu
Alabama Math, Science, and Technology Initiative; University of Alabama, Tuscaloosa

154 (BCEC)

376
Student-Centered Assessment: Letting Students Set Their Own Goals
3–5 Session
Students are more engaged in learning mathematics when they get to set their own learning goals and evaluate their progress. Come explore how student goal setting and student-created rubrics could help your students improve not only their mathematical achievement but also their attitudes towards mathematics!

Kateri Thunder
James Madison University, Harrisonburg, Virginia
Kyle Schultz, PhD
James Madison University, Harrisonburg, Virginia
Eric Imbrescia
Peak View Elementary School, Penn Laird, Virginia

104 C (BCEC)

377
Volume Measurement: Connecting 3-D Space and Number
Research Session
Discover new research-based, classroom-ready tasks designed to enhance your volume measurement instruction. We will share video of non-routine tasks that elicit students’ thinking about units, relate students’ number sentences to the structuring of 3-D space with units, and promote an understanding of what volume formulas mean and why they work.

Pamela S. Beck
Illinois State University, Normal
Cheryl L. Eames
Illinois State University, Normal
Jeffrey E. Barrett

ILLINOIS STATE UNIVERSITY, NORMAL 159 (BCEC)
9:30 A.M.–10:30 A.M.

378  
**Building Stamina/Curiosity in Middle School Classrooms through Problem Solving**  
*6–8 Session*  
Algebra concepts can be difficult for students to grasp. This presentation will provide engaging activities to increase curiosity and help students discover the value of the problem-solving process. Specific problems that can be used to differentiate mathematics instruction and challenge all learners relating to Common Core standards will be included.

Jennifer C. Brown  
The Chapin School, New York, New York
Lindsey Jaffe  
The Chapin School, New York, New York

DOUGLASS (WESTIN)

379  
**Comparing Ratios**  
*6–8 Session*  
“The CCSSM standards say students should be able to compare ratios. My students can compare fractions, is that enough?” No! The ability to compare ratios is vital for the development of ratio reasoning. We describe a sequence of engaging comparison tasks that lead to deep ratio understanding.

Luke T. Reinke  
Amplify, Durham, North Carolina
William G. McGowan  
Amplify, Brooklyn, New York

GRAND BALLROOM D (WESTIN)

380  
**Making Sense of Integer Operations: Contexts, Tasks, and Models**  
*6–8 Session*  
A negative times a negative is positive. That may be true, but does it make any sense? It can, in the right context. Learn how to use real-world contexts, well-designed tasks, chip and number-line models, and coordinate graphs to help students make sense of integer operations.

Michael H. Perkowski  
University of Missouri, Columbia
Debra A. Perkowski  
Dancing Cats Educational Consulting, Fulton, Missouri

157 A (BCEC)

381  
**Solving Equations: It’s Not Just a Balancing Act**  
*6–8 Session*  
Put away the cups and chips! What do we do to the left is what we do to the right! But why? During this session, we will study identities, properties, and the relationships between operations. Further, we will focus on applying knowledge of proportional reasoning and tape diagraming to understand, build, and solve equations coherently.

Erika Silva  
Curriculum Associate and Lead Writer, Common Core, Inc., Washington, D.C.
Stefanie M. Hassan  
Curriculum Associate and Lead Writer, Common Core, Inc., Los Angeles, California

GRAND BALLROOM A (WESTIN)

383  
**Let’s Not Be FLIP about It**  
*General Interest Session*  
Everyone’s heard about flipped classrooms, but what does it really take to make one successful? How can we efficiently use flipped class time to deepen students’ understanding of fundamental concepts? Come explore aspects of successfully flipping a math classroom, including implementation, assessment, what went well, and what we’ll never do again.

Louis J. Steiner  
Greens Farms Academy, Connecticut
Kurt Mederer  
Greens Farms Academy, Connecticut

GRAND BALLROOM A (WESTIN)

383.1  
**With Respect for Teaching: Making Mathematics Instruction Explicit**  
*General Interest Session*  
As aspirations grow for students’ mathematics learning, we talk about the importance of making classrooms places where all students are mathematically challenged and supported, without specifying what is involved in teaching in these ways. This session unpacks the work of teaching, offering insights for making teaching practice explicit and learnable.

Deborah Lowenberg Ball  
University of Michigan, Ann Arbor

GRAND BALLROOM B (WESTIN)
384
Principles to Actions: Using Good Tasks
9–12 Session
What tasks can help my students learn about statistics and sampling, or about connections between functions and geometry? We will work on problems that model Principles to Actions’ effective teaching practices, with an emphasis on selecting goals, choosing good tasks, planning for discourse, having multiple entry points, and using proper tools.
Fred Dillon
Ideastream, Cleveland, Ohio
Matthew Blue Taylor
New Visions for Public Schools, New York, New York

385
Games of Chance: Exploring CCSSM Probability Standards in Motivating Contexts
9–12 Session
Probability is often an intimidating topic for students. Discover how to motivate your students toward conceptual understandings in probability through exciting and engaging real-world applications, such as Texas hold ‘em poker. We will investigate sample tasks using multiple approaches connected to the Common Core State Standards for Mathematics.
Jonathan D. Watkins
University of Louisville, Kentucky

386
9–12 Session
When dynamically linked to sliders, graphs, tables, and diagrams, computer algebra systems (CAS) can connect multiple representations in calculus in new and powerful ways. We will illustrate the potential with several examples, including an infinite slider, L’Hôpital’s microscope, Taylor’s spreadsheet, and a graphically driven rocket elevator.
Thomas P. Dick
Mathematics Department, Oregon State University, Corvallis
Wade Ellis
West Valley College, San Jose, California

388
Explorations and Problem Solving with Heron’s Formula and Alternative Proofs
9–12 Session
Mathematical reasoning and problem solving will use Heron’s formula in various contexts. Illustration of a proof using complex numbers and a geometric proof using excircles and in-circles will be given. Problems will explore some optimization of areas and the search for all triangles with integer sides and integer area for a fixed perimeter.
James Wilson
University of Georgia, Athens

389
The General Case: Differentiating through Abstraction
9–12 Session
Want your students to know what lies beyond the basic content, while still empowering struggling students? Participants will learn how to provide hints while modeling a problem-solving process and how to guide students beyond getting an answer to develop conjectures and consider special cases. Leave with warm-up activities and project ideas!
Amy Bigelow
Franklin Academy, East Haddam, Connecticut

390
Implementing Emerging Technologies in Freshman-Level Mathematics to Ensure Student Success
Higher Education Session
Faculty members teaching freshman-level mathematics at an open-enrollment university describe how instructor-generated video explanations are used to engage students in the learning process. Data collected suggests that the use of video instruction can reduce failure and withdrawal rates in both face-to-face and online courses.
Jennifer Hegeman
Missouri Western State University, St. Joseph
Steven Klassen
Missouri Western State University, St. Joseph
9:30 A.M.—10:30 A.M.

**390.1**

**Crazy 8s: It’s Not Your Ordinary Math Club!**

Pre-K–5 Exhibitor Workshop

Get the scoop on Crazy 8s, a high-energy afterschool club for kids ages 5–10. Hands-on activities like Spy Training and Toilet Paper Olympics appeal to any kid. Bedtime Math provides a free kit with scripts and most materials; schools provide a few supplies and an enthusiastic coach. It’s time to make math the cool thing to do after school!

**Bedtime Math Foundation**  
Summit, New Jersey  
105 (BCEC)

**390.2**

**Introduction to Bridges in Mathematics K-5**

Pre-K–5 Exhibitor Workshop

Bridges in Mathematics, second edition, is a comprehensive K–5 curriculum that equips teachers to fully implement the Common Core State Standards in a manner that is rigorous, engaging, and accessible. Join us for an overview of this unique program. Learn more about work places, visual models, and putting the mathematical practices into action.

**The Math Learning Center**  
Salem, Oregon  
153B (BCEC)

**390.3**

**Daily Discussion around Calendar Math to Implement the Mathematical Practices**

Pre-K–6 Exhibitor Workshop

In a discussion format centered on the daily elements for Every Day Counts, we will explore how daily discourse can lead to developing number sense, place value, and a natural implementation of the Mathematical Practices. Participants will receive suggestions for daily questions and ideas for student engagement.

**Houghton Mifflin Harcourt**  
Boston, Massachusetts  
151B (BCEC)

**390.4**

**Formative Assessment and Hands-On Instruction for RtI and CCSS Success!**

(6–8) Exhibitor Workshop

Celebrate 35 years of success improving achievement for struggling students! Our pre-K–12 programs integrate the essential elements of RtI: Universal Screening, Decision Making, Explicit Instruction, and Progress Monitoring. Engage in strategies using the CRA methodology using manipulatives. Programs and proven results from summer school 2014 will be shared.

**Math Teachers Press, Inc.**  
Minneapolis, Minnesota  
152 (BCEC)

**390.5**

**Building Concepts in Ratios and Proportional Reasoning**

6–8 Exhibitor Workshop

The Common Core standard describe the coherence and connection of mathematics through the grade levels. In this session, we’ll explore free lesson resources that follow the CCSSM Learning Progression for Ratios and Proportional Reasoning. Learn how interactive technology can be used to engage students and provide new ways to think about and discuss mathematics.

**Texas Instruments**  
Dallas, Texas  
153A (BCEC)

**390.6**

**Pearson’s Digits on Realize: Where Math Clicks for Middle School!**

6–8 Exhibitor Workshop

Experience digits, the only middle grades math curriculum built for today’s digital students with interactive whiteboard lessons, online assessments, robust RtI, and automatic grading and reporting. Find out how digits harnesses the power of technology to optimize your time and individualize their learning—both in and out of the classroom.

**Pearson**  
Upper Saddle River, New Jersey  
151A (BCEC)
9:45 A.M.–11:00 A.M.

391
Making Math Meaningful: Problem Solving with Place Value
Pre-K–2 Gallery Workshop
From subitizing to multidigit operations, place value provides a critical foundation for student success in math. Come explore concrete and visual models, mental strategies, and context problems that make math meaningful in the early years. The handout includes ready-to-use activities using innovative ten-frame models and other representations.

Kimberly A. Rimbey
Rodel Foundation of Arizona, Scottsdale

256 (BCEC)

392
Facts, Fluency, and Fun
Pre-K–2 Gallery Workshop
This presentation will focus on the importance of fluency concepts in the primary and middle grades that will allow students to gain mastery in counting, number facts, computation, and place value. There will be learning discussions, informational reading, modeling videos, hands-on activities, and plenty of resources to take right to your classroom.

Tiffany Banks
Chicago Public Schools, Illinois
Sharonda Thomas
Chicago Public Schools, Illinois

206 A/B (BCEC)

394
Spice Up Your Daily Routine with Data
Pre-K–2 Gallery Workshop
Come explore ways to incorporate data into your daily routine. Join us for hands-on exploration of graphing and learn how to construct “daily” graphs that only take minutes of your classroom time. Have fun creating glyphs, reverse graphs, candy circle graphs, and much more. Come explore innovative ideas and add valuable tools to your repertoire.

Janet M. Shiver
Central Washington University, Ellensburg
Teri Willard
Central Washington University, Ellensburg

107 B/C (BCEC)

395
What’s the Problem?
3–5 Gallery Workshop
The Common Core standards for K–5 list a variety of problem situations for students to consider as they apply their thinking with operations and algebra. Knowing the expectations of the different situations will assist teachers in providing opportunities for students to engage in numerous situations. What problem situations do your students understand?

Rob Nickerson
ORIGO Education, St. Charles, Missouri

253 A (BCEC)

2015 Regional Conferences:
Atlantic City October 21–23
Minneapolis November 11–13
Nashville November 18–20
9:45 A.M.–11:00 A.M.

396
Don’t Be a Snob! Use Inclusive Geometry!
3–5 Gallery Workshop
Understanding the language of geometry and the hierarchy of shapes based on their properties is essential. Bring excitement and deep conceptual understanding into your classroom by building, drawing, and analyzing 2-D shapes. These activities will be easy to implement in your classroom. Come share fun and ensure mathematical success for all!

Marrie S. Lasater
Middle Tennessee State University and Math Consultant with MC2, Murfreesboro
Catherine Jones Kuhns
Country Hills Elementary, Coral Springs, Florida

COMMONWEALTH A-B (WESTIN)

397
Fear Not the Fraction
3–5 Gallery Workshop
The Common Core uses multiple models of fractions to help elementary students gain deep understanding of the concept and proficiency with skills. This workshop will explore the benefits of each model to help transform your teaching of fractions.

James Leslie Burnett
ORIGO Education, St. Charles, Missouri

157 B/C (BCEC)

398
Properties, Partials, and Practices
3–5 Gallery Workshop
This session will be a deep dive with the properties of multiplication, multi-digit x/÷, and the Standards for Mathematical Practice. Participants will investigate the conceptual meaning of these concepts through practice-rich tasks. This session will expose how these concepts are developed across grades. Resources will be shared.

John J. Sangiovanni
Howard County Public School System, Ellicott City, Maryland

205 C (BCEC)

399
Area: Building Relationships between Whole Number and Fraction Multiplication
6–8 Gallery Workshop
Come and learn how the area model, often used with the multiplication of whole numbers, can be used to develop an understanding of the multiplication of fractions (decimal, proper, mixed, and improper). We will use grid paper throughout the workshop to explore these relationships and to illustrate how this work leads to algebra.

Florence Glanfield
Board of Directors, National Council of Teachers of Mathematics; University of Alberta, Edmonton, Canada

104 A/B (BCEC)

400
How Much Money Can Really Fit in a Briefcase?
3–5 Gallery Workshop
Have you ever wondered if the amount of money in a movie briefcase is realistic? Discover how you can engage your students in understanding and applying measurement, estimation, surface area, and volume concepts through a ready-to-use, hands-on, collaborative project. There is nothing more engaging in math than money, and this is a lot of it.

Dawn Straith
Hillel Day School, Farmington Hills, Michigan

210 A (BCEC)

401
Show Me the Connection! Fractions, Ratios, and Proportions in CCSSM
6–8 Gallery Workshop
The Common Core standards delineate the connections between fractions, ratios, and proportional reasoning, but these concepts are intricately related. This presentation will have participants explore the relationships between fractions in grades 3–5 to ratios and proportional reasoning in middle and high school.

Calzi Holaway
University of Alabama, Tuscaloosa, Alabama
Julie Herron
California Polytechnic State University, San Luis Obispo

GRAND BALLROOM E (WESTIN)
Immerse yourself in two and a half days of professional development dedicated to algebra readiness, and walk away with practical methods to prepare your students for success.

NCTM’s Interactive Institute offers a variety of activities and instructional techniques to give your students opportunities to develop strong algebraic reasoning skills. You’ll also learn strategies that will help you align your instruction with the Common Core State Standards while giving your students the tools they need to succeed.

- Gain strategies to build the foundation of knowledge and skills that leads to students’ future success in algebra.
- Use Principles to Actions as a tool for learning new instructional techniques for posing purposeful questions, engaging students in productive discourse, and building student responsibility within the community of learners.
- Learn strategies for implementing tasks that promote reasoning and problem solving, that provide all students opportunities to develop strong algebraic reasoning skills.

Visit [www.nctm.org/algebra](http://www.nctm.org/algebra) to learn more and register.

**Space is limited—REGISTER TODAY! [www.nctm.org/algebra](http://www.nctm.org/algebra)**
**Math Masters: Not Your Grandmother’s Math Competition**

**6–8 Gallery Workshop**

Are your students ready for a change in pace from traditional math competitions? Join us as we share how we developed an engaging middle grades math competition that students loved. We’ll engage you in solving a hands-on task used in our competition. Then, we’ll share what we learned about student thinking.

Deirdre C. Greer  
Columbus State University, Georgia  
Denise S. Peppers  
Columbus Regional Mathematics Collaborative, Columbus State University, Georgia

**Yikes! My Students’ Fraction Knowledge Looks Like Swiss Cheese!**

**6–8 Gallery Workshop**

This session will examine the unfinished learning that your students may have in fractions. With the help of some Common Core resources, we will learn how to assess their knowledge of fractions and use these assessments to teach our grade level standards. We will also look at grade-level lessons that can be used to fill in the holes.

Amy Salgo  
Northwestern RPDP, Washoe County School District, Nevada  
Marissa McClish  
Regional Professional Development Program, Reno, Nevada

**Bring History to Life in Your Math Class**

**6–8 Gallery Workshop**

Experience a hands-on activity during which students get to discover and manipulate ancient surveying instruments. History comes to life in this activity based on similar triangles and trigonometry. See how it gets your students thinking differently.

Kathleen Quesnel  
Collège Durocher St-Lambert, St-Lambert, Canada

**Orchestrating Discourse: Using the iPad to Implement the Five Practices**

**6–8 Gallery Workshop**

Learn how to use the iPad to enhance classroom discussions. Hands-on activities will be used to model various technology features that allow all students to have a more active role in describing the strategies they use to solve problems and gives the teacher more visual ways to connect student thinking.

Terry R. Wyberg  
University of Minnesota, St. Paul

**Preparing Today’s Students for the Workforce of Tomorrow**

**9–12 Gallery Workshop**

Learn how to better prepare students for the jobs available to them in the future and help them answer the question, “Why do I need to learn this math?” Participate in hands-on student activities developed by a team of teachers and technicians from a variety of career fields engaged in providing “real world” applications of math.

Sandy C. Wilborn  
Virginia Advanced Study Strategies, South Boston  
Jennifer F. Stevens  
Virginia Advanced Study Strategies, South Boston

**Problems Worthy of Your Effort and Your Student’s Engagement**

**9–12 Gallery Workshop**

This session will engage participants in three mathematical tasks that catalyze NCTM’s messages around reasoning and sense making while tapping a set of habits of mind closely aligned with the Standards for Mathematical Practice.

J. Michael Shaughnessy  
Past President, National Council of Teachers of Mathematics; Portland State University, Oregon
9:45 A.M.–11:00 A.M.

408
Statistical Investigations and Analyses with FREE GeoGebra Software
9–12 Gallery Workshop
Learn how to use GeoGebra for statistical investigations and analyses. Participants will explore concepts, make graphical displays, compute statistics, do probability calculations, find regression lines, and carry out inferential methods (significance tests and confidence intervals). Please have GeoGebra installed in advance (www.geogebra.org).

Stephen J. Miller
Winchester Thurston School, Pittsburgh, Pennsylvania

409
Using Mathematical Teams to Teach the CCSS Practice Standards
6–8 Gallery Workshop
This gallery workshop will model how to effectively use mathematical study teams during classroom instruction to support the teaching of the Common Core Standards for Mathematical Practice such as making sense of problems, persevering in problem solving, attending to precision, and modeling with mathematics.

Lisa R. Krause
University of Kentucky, Lexington
Danielle E. Boggs
Franklin Middle School, Champaign School District, Champaign, Illinois

410
What’s My Move: A Kinesthetic Multisensory Approach to Graphing
9–12 Gallery Workshop
Graphs are one type of mathematical representation that often challenges secondary students. This session will explore how kinesthetic learning occurs by direct experience, and how understanding develops as a result of what was done rather than what was said or read in the secondary mathematics classroom.

Leslie A. Texas
Leslie Texas Consulting, Louisville, Kentucky
Tammy L. Jones
TLJ Consulting Group, Nashville, Tennessee

411
(MAPS)²: Munchy AP Statistics Mathematical Problem Solving Success for All!
9–12 Gallery Workshop
Hands-on classroom anchor activities will motivate your students using cookies, Teddy Grahams, M&Ms, technology, and more. Difficult topics of experimental design, hypothesis testing, Type I/II error, and more will come alive through these activities and make connections for students.

Viva M. Hathaway
Norfolk Public Schools, Virginia

412
Quadratic Functions in Multiple Representations
9–12 Gallery Workshop
Instruction of quadratic models centers around using a parabolic graph or an equation representation to explore the concepts of intercepts, symmetry, and extrema. In this session we will explore how these concepts can be taught using four representations (including graphs and equations) and discuss what the various representations highlight or mask.

Patrick M. Kimani
Glendale Community College, Arizona

413
Reasoning, Proving, Conjecturing, and Refuting—The Heart of Mathematics
Preservice and In-Service Gallery Workshop
Both the NCTM Process Standards and the Common Core mathematical practices ("reason abstractly" and "construct viable arguments") articulate that all teachers address and engage students in reasoning and sense making. This hands-on workshop will engage participants in problems where justifying one’s solution is paramount in fostering increased understanding and maturity.

Jay L. Schiffman
Rowan University, Glassboro, New Jersey

GRAND BALLROOM C (WESTIN)
9:45 A.M.—11:00 A.M.

414 What Counts? Developing a Communal Classroom Criteria of Proof
Preservice and In-Service Gallery Workshop
Participants will evaluate sample arguments for the Sticky Gum Problem, accessible to middle grades through college-level learners and focused on reasoning-proof. From our evaluations, we will develop criteria for what counts as proof, and we will discuss how to facilitate a similar experience with students. Sean Yee will also facilitate the session.

Justin D. Boyle
University of Alabama, Tuscaloosa
Sarah K. Bleiler
Middle Tennessee State University, Murfreesboro
Yi-Yin Ko
Indiana State University, Terre Haute

11:00 A.M.—12:00 P.M.

415 Building a Culture of Collaboration Connecting Math and Science Instruction
General Interest Session
The inherent interdependence between the practices of science and mathematics provides opportunities to strengthen instruction. It is critical to build a school culture that supports meaningful connections, in order to achieve quantitative understanding of the core ideas and crosscutting concepts in the Next Generation Science Standards.

Juliana Texley
National Science Teachers Association, Arlington, Virginia

156 A/B (BCEC)

416 Developing Your Classroom beyond the Walls
General Interest Session
Are you inspired to create a space for your classroom beyond the four walls you work in? Come to better understand how to support your students’ ability to critique the reasoning of others and form viable arguments through the use of a classroom blog. Learn to make your classroom website a social space for students to share their mathematical experience.

Dvora Geller
New Visions for Public Schools, New York, New York
Scott Bruss
New Visions for Public Schools, New York, New York

253 B (BCEC)

417 Effective Teaching: Managing Your Intellectual Resources
General Interest Session
Strategies for and examples of effective teaching and learning that emanate from the careful identification and use of the intellectual capital that resides in a classroom will be shared.

Lee V. Stiff
Past President, National Council of Teachers of Mathematics; North Carolina State University, Raleigh

260 (BCEC)

418 Engaging Innovative Tasks for Assessing CCSSM
9–12 Session
In an effort to fully represent the skills described in CCSSM, several innovative item types are being used in standardized assessments. We will share our experience developing innovative assessments that are more reflective of the mathematical content and practices they are designed to represent. Examples of innovative items will be discussed.

Luis Saldivia
ETS, Princeton, New Jersey
Michelle Worthington
ETS, Princeton, New Jersey

259 A (BCEC)
FRIDAY

419  Mathematics Education for the 21st Century: Creating a Climate of Success
General Interest Session
Iris M. Carl Equity Address
Rapid and dramatic technological and demographic changes in the 21st century present our nation’s schools, colleges, and universities with enormous challenges for educating students from all backgrounds in mathematics and other STEM fields. Dr. Hrabowski, President of the University of Maryland, Baltimore County, will talk about his lifelong love of mathematics and his research over the past three decades as he discusses strategies and approaches to confront these challenges.

Freeman A. Hrabowski, III, has served as president of UMBC (University of Maryland, Baltimore County) since 1992. His research and publications focus on science and math education, with special emphasis on minority participation and performance. He has authored numerous articles and co-authored two books, Beating the Odds and Overcoming the Odds, focusing on parenting and high-achieving African American males and females in science.

In 2008, Hrabowski was named one of America’s Best Leaders by U.S. News & World Report. Time magazine named him one of America’s 10 Best College Presidents in 2009 and one of the 100 Most Influential People in the World in 2012. In 2012, he was among the inaugural inductees into the U.S. News & World Report STEM Solutions Leadership Hall of Fame. He was recently named by President Obama to chair the newly created President’s Advisory Commission on Educational Excellence for African Americans.

Freeman A. Hrabowski
University of Maryland, Baltimore County (UMBC)

420  NCTM’s Mathematics Education Trust Provides Grants and Awards: Apply!
General Interest Session
The Mathematics Education Trust (MET) is a resource for mathematics teachers (and students) at all levels. Come and experience what others have used money for and learn how to apply for yourself or your school. Sixty minutes of conference time could be beneficial for your mathematics future.

Johnny W. Lott
Chair, MET Board of Trustees, Past President, National Council of Teachers of Mathematics; Retired, University of Montana, Montana

422  Practical Strategies for Teaching with Interactive Computer Simulations
General Interest Session
You can use interactive simulations (sims) to engage your students with math content and support their development of the CCSS mathematical practices. Learn practical strategies for integrating sims into your teaching and designing sim-based activities. Videos of teacher practices for effective sim use and lesson plans will be shared.

Karina K. R. Hensberry
University of Colorado Boulder
Amanda McGarry
University of Colorado Boulder

423  Spreadsheet Math: A Powerful Tool for the Practice of Mathematics
6–8 Session
Spreadsheets, the main quantitative tool for business and for STEM jobs today, can also be wonderful learning tools for students. We have developed over 100 spreadsheet lessons and case-study experiments for you to use at no cost in your classrooms. Come learn the power of spreadsheets as visual function machines for learning.

Art Bardige
Sustainablelearning, Cambridge, Massachusetts
Peter Mili
Sustainablelearning, Cambridge, Massachusetts
11:00 A.M.–12:00 P.M.

424
Women in Math—Equity Matters!
General Interest Session
Come hear from a panel of equity experts as we discuss the importance of equity in the math classroom, how to build a strong math self-concept in girls, strategies for encouraging girls and women in mathematics, and important issues related to gender equity in mathematics.
Melissa Hosten
Maricopa County Education Service Agency, Phoenix, Arizona
Judith E. Jacobs
JEJMath Ltd., Ann Arbor, Michigan

GRAND BALLROOM A (WESTIN)

425
Beyond Show and Tell: Orchestrating Powerful Discussions
Pre-K–2 Session
Engage in productive discussion that moves beyond show and tell of student strategies. Unpack the different goals for math talk and discuss how to plan and orchestrate discussions that help students participate in and learn from strategy sharing.
Cathery Yeh
University of California, Irvine
Jody Guarino
University of California, Irvine

DOUGLASS (WESTIN)

426
Developing Number and Operation Concepts with Ten-Frames
Pre-K–2 Session
Ten-frames, a useful tool for K–2 teaching and learning, is the focus for this hands-on session. Activities provided match Common Core Math Standards centering on counting/cardinality, operations/algebraic thinking, and number/operations in base 10. Assessment suggestions are included.
Ruth Harbin Miles
Board of Directors, National Council of Teachers of Mathematics; Mary Baldwin College, Staunton, Virginia
Don S. Balka
Retired Consultant, St. Mary’s College, Notre Dame, Indiana

205 B (BCEC)

427
Using Formative Assessments to Pinpoint Struggling Students’ Strengths and Disconnects
Pre-K–2 Session
Without purposeful formative assessments, we risk “treating the symptoms” of a child’s misunderstanding instead of “curing the cause.” We can also underestimate a child’s understanding and misdirect interventions. This interactive session includes a student case that illuminates the need for determining students’ thinking before and during instruction.
Sandy Atkins
Creating AHAs, St. Petersburg, Florida
Molly Daley
Evergreen Public Schools, Vancouver, Washington

203 (BCEC)

428
Strategies for Developing Math Talk
3–5 Session
The Common Core emphasizes the importance of students being able to explain their thinking and reasoning in mathematics. Learn how teachers can foster good mathematical communication among students through the strategic use of various forms of classroom talk. Leave with strategies and materials ready to use the next day in a classroom.
Molly M. Rawding
Lexington Public Schools, Massachusetts
Tara A. McKenzie
Braintree Public Schools, Massachusetts

107 A (BCEC)

429
Transforming Intervention: Moving from Skills Remediation to Rich Problem Solving
3–5 Session
Intervention has traditionally been focused on skills remediation. Come learn how to transform intervention time into a problem-solving workshop in which students build identities as mathematicians while engaging in rich problem solving. Video will deepen participants’ understanding of how to implement these workshops in their own classrooms.
Kassia J. Omohundro Wedekind
Fairfax County Public Schools, Falls Church, Virginia
Mary Beth Dillane
Fairfax County Public Schools, Falls Church, Virginia

159 (BCEC)
11:00 A.M.–12:00 P.M.

430  
**Authentic Learning with iPads: Creating Visual Representations and Explaining Understandings**  
6–8 Session

While iPads/tablets have many potential educational uses, the most powerful of these are creating and communicating. Both teachers and students can use whiteboard apps to create and access manipulatives or templates that support exploration of mathematical ideas. They can then communicate and confirm their understandings by creating video explanations.

Tim Pelton  
University of Victoria, Canada  
Leslee Francis Pelton  
University of Victoria, Canada

431  
**Examining Rich Problems and Tasks via Technology**  
6–8 Session

This session will examine rich problems and tasks that are generated via pictures and video (rather than words on the papers) and demonstrate how such media can lead to rich discourse, motivation, and deeper mathematical understanding.

Eric Milou  
Rowan University, Glassboro, New Jersey

432  
**STEAM: An Innovative Approach to Promote Mathematics**  
6–8 Session

Integration of the arts into STEM disciplines, an initiative known as STEAM, will be discussed with a focus on mathematics. Activities merging visual arts, dance, music, and drama offer innovative ways to make math accessible to diverse populations. Potential benefits including enhanced student motivation and positive attitudes will be addressed.

Michaele F. Chappell  
Middle Tennessee State University, Murfreesboro  
Derek Smith  
Nashville State Community College, Tennessee

433  
**Proportionality, Slope, and Similar Figures from a CCSSM Perspective**  
6–8 Session

This presentation will use classroom video clips, mathematical tasks, and dynamic visual representations to engage participants in actively examining the connections between proportionality, slope, and similarity from a transformations-based perspective. Specific CCSSM content and practice standards will be highlighted explicitly.

Nanette M. Seago  
WestEd, Redwood City, California

434  
**Linear Relationships Project**  
6–8 Session

This is a culminating activity to demonstrate mastery of the skills involved for constructing linear relationships. Each student creates a design with a variety of line segments that shows their knowledge of writing and graphing equations. There are multiple versions with different degrees of complexity depending on student ability and interest.

Beth Chestnutt  
Amherst Middle School, New Hampshire  
Nancy Monks  
Amherst School District, New Hampshire

435  
**Teaching High School Math through Real-World Topics**  
9–12 Session

How has the iPod depreciated over time? In basketball, should you ever foul at the buzzer? How valuable is a social network? We’ll explore a range of real-world lessons that teachers can immediately use to address Common Core standards in fresh ways, ones that foster a rigorous understanding of math and challenge students to think critically.

Karim K. Ani  
Mathalicious, Charlottesville, Virginia
11:00 A.M.–12:00 P.M.

436
Teaching Transformational Geometry with Technology
9–12 Session
One major change in CCCSM is an emphasis on transformations in geometry. In this session, we will examine how dynamic geometry technology can help students develop an understanding of key properties of rigid motions. Using key questions about identifying rigid motions, we will investigate the role of transformations in congruence proofs.

Daniel R. Ilaria
West Chester University of Pennsylvania, West Chester

437
Connecting Integrated High School Math to CCSS 5–8 Content
9–12 Session
The Common Core focuses on long-term development of content, and teacher knowledge of the math on the horizon is essential. We will discuss the development of knowledge related to functions in grades 5–8 and how this affects function instruction and content progression in integrated grades 9–12 courses.

Mary Elizabeth R. Matthews
California State University, Chico

438
Let’s Look at Color: Matrices and Images, What’s in Common
Higher Education Session
Explore how color images are represented and stored as pixel values in matrices, an application dependent on matrix mathematics and technology. Matrices are required to handle large data sets. I will focus on cross-disciplinary problem-solving methods and experiential learning opportunities for students.

Susan G. Helser
Mott Community College, Flint, Michigan

439
Mathematics Reading and Discourse Strategies for ELLs That Work
9–12 Session
Participants will practice three effective strategies to engage secondary mathematics students in reading and discourse: dictation, math speeches, and a group quiz. All three activities are grounded in fundamental ELL pedagogy, CCSSM, and universal design. I will also discuss one strategy that has proved to be problematic.

Angela Thompson
Governors State University, University Park, Illinois

440
The Mandelbrot Set Viewed through Precalculus
9–12 Session
Have you marveled at the beauty of the Mandelbrot set but never understood how it is created? Have you wondered where complex numbers, binomial expansion, polar form, and DeMoivre’s theorem all combine to simply create the Mandelbrot set? We investigate how the fractal is interactively drawn in the Processing.org computer language.

Daniel S. Anderson
Queensbury High School, New York

440.1
Algebra Readiness for All: The Critical Role of Innovative Technology
General Interest Exhibitor Workshop
Come learn how IXL, the most widely used math subscription site in the country, is partnering with educators to ensure algebra readiness for all students. Aligned with all 50 state standards, IXL delivers truly differentiated, thoughtfully crafted technologies to engage students and close achievement gaps.

IXL Learning
San Mateo, California
11:00 A.M.–12:00 P.M.

440.2  
**What Do Zombies Have To Do With It?**  
General Interest Exhibitor Workshop

Are your students bored with the “real world” in the math classroom? Give them something to scream about! We will explore free lessons that use Hollywood themes to engage students in learning math and science concepts in context. Resources include dynamic simulations that allow students to experiment with and better visualize the concepts.

*Texas Instruments*
Dallas, Texas

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440.3  
**Unleash the Power of Games-Based Math with Mangahigh.com**  
General Interest Exhibitor Workshop

Mangahigh has revolutionized the way we engage students in our math classrooms. With interactive games and clever adaptive quizzes, all mapped to the curriculum for K–10, Mangahigh brings dramatic improvements in students’ attitudes towards learning math. Attend to claim your free 60-day trial of www.mangahigh.com!

*Mangahigh.com*
London, England, United Kingdom

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440.4  
**STEM in Your Pre-K Classroom: You Can Do It!**  
Pre-K–2 Exhibitor Workshop

Is STEM becoming part of your vocabulary? This hands-on session will show you how you can seamlessly integrate engaging math (STEMathematics) activities into your pre-K curriculum. Connect and teach these essential concepts (using hands-on and digital tools) along with other critical learning areas like executive function and creative expression.

*Houghton Mifflin Harcourt*
Boston, Massachusetts

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440.5  
**Using Common Sense to Implement the Common Core**  
9–12 Exhibitor Workshop

Skills. Concepts. Applications. These are the three components necessary for a meaningful math curriculum. Join us to see how the Common Core can help to keep curricula balanced across the grade levels. Sample topic: How might a specific mathematical idea such as “area,” “number sense,” or “linear functions” be presented including these three elements?

*It's About Time*
Mt Kisco, New York

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440.6  
**Pearson High School Math for College and Career Readiness**  
9–12 Exhibitor Workshop

Learn how this blended print/digital curriculum not only engages students but also ensures all learners acquire the critical knowledge and skills necessary for success in college and beyond—with an assist by MathXL for School, Pearson’s personalized learning solution for online homework, tutorials, and assessment.

*Pearson*
Upper Saddle River, New Jersey

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Check out the Exhibitor Workshops!
11:30 A.M.–12:00 P.M.

441
Comparison of USA and Taiwan in TIMSS Mathematics: Some Surprises
Research Burst
Drawing on data from the TIMSS international data base of mathematics achievement, this presentation identifies specific items on which U.S. students outperform students in an Asian country, as well as items on which U.S. performance departs in a markedly negative direction from what would be predicted by total scores.

Thomas P. Hogan
University of Scranton, Pennsylvania
Pai-Chen Hsueh University of Scranton, Pennsylvania

210 A (BCEC)

442
Hierarchy of Operations: A Strengthening Strand for K–16
General Interest / All Audiences Burst
The order of operations is more than an arbitrary set of rules. When understood as a hierarchy, with one level relating to the next lower or higher operation, this structure can facilitate stronger understanding of concepts from elementary grades through college—from counting and skip-counting to distributive properties and use of logarithms.

Sean H. Genovese
MCUSD #185, Macomb Jr./Sr. High School, Macomb, Illinois

109 A/B (BCEC)

443
How to Flip without Flopping: Implementing a Flipped Classroom
General Interest / All Audiences Burst
Flipping your classroom can lead to better differentiated instruction and a more efficient use of class time when implemented well. I will lead a discussion about what has worked since I flipped and what has not. The lecture part of this presentation is flipped (http://vimeo.com/83638877) so that we can spend most of the time on discussion and Q&A.

Ross Benson
Cambridge Public Schools, Massachusetts

GRAND BALLROOM E (WESTIN)

444
Improving Mathematics Lesson Design with Video-Based Lesson Study
General Interest / All Audiences Burst
Learn the essentials of video-based lesson study, a proven method for enhancing your mathematics instruction through iterative lesson design at a pace that matches your busy schedule. Topics to include satisfying legal hurdles for classroom videotaping, technical know-how for better video, and maximizing the use of video for lesson enhancement.

Thomas E. Ricks
Louisiana State University, Baton Rouge

COMMONWEALTH A-B (WESTIN)

445
Nix the Tricks
General Interest / All Audiences Burst
Being a mathematics student is about critical thinking, justification, and using tools of past experiences to solve new problems. Students who approach every topic as a series of steps to memorize are not learning math. In this session we will explore how to replace some popular tricks with teaching for understanding.

Tina Cardone
Salem High School, Salem, Massachusetts
Ashli J. Black
Illustrative Mathematics, Tucson, Arizona

206 A/B (BCEC)

446
Helping Students Master Basic Addition Facts
Pre-K–2 Burst
Mastering basic addition facts is essential and accessible to all students. Various activities will be shared showing how four essential number relationships and ten-frame games can help students master facts and also improve their understanding of place value.

Kimberly K. Hartweg
Western Illinois University, Macomb, Illinois
11:30 A.M.–12:00 P.M.

447
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 that increase speed and accuracy with addition, subtraction, and multiplication. Participants will have an opportunity to practice these engaging activities and will return to the classroom ready to implement a strong fluency program with confidence.

Melanie Gutierrez
Common Core, Inc., Philadelphia, Pennsylvania

448
Too Young for Algebra
Pre-K–2 Burst
This session will present why algebra needs to be taught in early school years and presents practical ideas for how to teach young children algebra and promote their algebraic reasoning.

Joohi Lee
University of Texas at Arlington
Karen Allmond
University of Texas at Arlington

449
Teaching for Mathematical Comprehension: Developing Deeper-Level Thinking
Pre-K–2 Burst
What is more important: the how, or the why? Too often, students memorize processes with little understanding of foundational mathematical concepts. It is imperative that instruction consist of strategies that deepen student mathematical comprehension. Learn about instructional strategies that help to develop mathematical comprehension.

David A. R. Costello
English Language School Board of Prince Edward Island, Summerside, Canada

450
Using a Rubric to Assess Problem Solving and Guide Instruction
3–5 Burst
What happens when teachers use a rubric to assess student progress on problem solving at least once per quarter? Come hear the results of an action research project that focused on a rubric to score their students’ work on problem solving. Learn more about the parts of the rubric, the data collected, and the feedback given by teachers.

Mimi Granados
Westgate Elementary School, Fairfax County Public Schools, Falls Church, Virginia

451
Communication and Argumentation: Rich Connections between Mathematics and Language Arts
3–5 Burst
In this presentation, attendees will learn about the connections between the English Language Arts standards and Mathematics standards, specifically with regard to the expectations for communication and argumentation in the upper elementary grade levels. Participants will learn about classroom activities that emphasize the standards in both areas.

Chepina Rumsey
Kansas State University, Manhattan

452
Lesson Study through the “Mathematics Teacher Educator” Lens
Research Burst
The professional development of mathematics teacher educators is a growing topic of interest in mathematics education literature. In this presentation we discuss how engagement in a cycle of Lesson Study in a primary school allowed a group of mathematics teacher educators to reflect critically on their work with student teachers.

Therese Dooley Dooley
St. Patrick’s College, Dublin, Ireland
Siun NicMhuiri
St. Patrick’s College, Dublin, Ireland
Miriam Ryan
St. Patrick’s College, Dublin, Ireland
11:30 A.M.–12:00 P.M.

453 Harnessing the Power of Student Reflection to Increase Learning
3–5 Burst
John Dewey said, “We do not learn from experience; we learn from reflecting on experience.” Having students reflect on assessments encourages true understanding. Reflecting helps to set goals, guide instruction, and student growth. Reflection makes learning stick. When students learn how to reflect and have time to reflect, student achievement increases.

Rachel W. Manjarres
Woodridge Elementary School District 68, Illinois

GRAND BALLROOM C (WESTIN)

454 Please ELIMINATE My Dear Aunt Sally
3–5 Burst
PEMDAS doesn’t work. Students misuse it as a step-by-step guide to simplifying expressions regardless of how clearly their teachers have explained the process. We will demonstrate three different and highly effective ways to teach the order of operations without PEMDAS. We will ELIMINATE most common student errors by eliminating Aunt Sally.

Laura K. Sellar
Metropolitan School District of Washington Township, Indianapolis, Indiana
Michelle R. Reel
Metropolitan School District of Washington Township, Indianapolis, Indiana

160 B/C (BCEC)

455 “I Love Math Day”
6–8 Burst
Every year, one middle school celebrates “I Love Math Day” on February 14 to build positive math community since 2006. In this session, you will learn what you need to start building positive math community and how you prepare activities.

Gary Lawrence
Mustard Seed School, Hoboken, New Jersey
Hoyun Cho
Capital University, Columbus, Ohio

258 C (BCEC)

456 Using Number Talks in Middle School Math
6–8 Burst
Our team of teacher researchers incorporated number talks into four middle school math academic support classes. Students were given pre- and post-tests that measured their computational fluency and confidence in multiplication and division. In this talk, we discuss the implementation of the number talks and the results of the research.

Emma Natalia Carr
University of Colorado (CUTeach Student), Boulder
Maddison Myers
University of Colorado (CUTeach Student), Boulder

205 A (BCEC)

457 Assessing Conceptual Understanding
9–12 Burst
Mathematical understanding is a balance between conceptual and mechanical fluency. This presentation offers specific problems that assess conceptual understanding and presents methodologies for creating such questions. Specific topics include inequalities, functions, and limits. Participants will have the opportunity to develop their own problems.

Chris Chung
Episcopal Academy, Newtown Square, Pennsylvania
Adam Lavallee
Episcopal Academy, Newtown Square, Pennsylvania

258 B (BCEC)

458 Cherry-Picking Solutions: Different Is NotNecessarily Wrong
6–8 Burst
How would you respond to students who make up their own solutions that deviate completely from what you taught them? Learn our experience of teaching gifted students whose solutions might often at first be perceived as incompetence in basic math skills but yet, in fact, demonstrated maturity of higher level of mathematical thinking.

Hartono Tjoe
Penn State Berks, Reading, Pennsylvania

156 A/B (BCEC)
11:30 A.M.–12:00 P.M.

459 Exploring Exponential Growth through Epidemics!
6–8 Burst
The phenomenon of epidemics is mathematical and intriguing. We share an activity used to introduce students to exponential functions. We explain our process: setting the context using movies, books, and history; a classroom simulation; posing questions about patterns, multiple representations, and applications; and real-life considerations.

Sarah B. Bush
Bellarmine University, Louisville, Kentucky
Karen Karp
University of Louisville, Kentucky
Fred Dillon
Ideastream, Cleveland, Ohio

460 Seeing the Golden Ratio in a Five-Pointed Star
9–12 Burst
Students will be amazed by the patterns they can find in a five-pointed star inscribed in a regular pentagon. The design abounds with congruent and similar polygons. Use a proportion and a quadratic equation to generate the golden ratio. Talk about transformations!

Shana Frank
Boston University, Massachusetts

461 Transformational Geometry Applied through the Use of SketchUp
6–8 Burst
Looking for a way to engage your students? In this session learn to leverage the power of free 3-D geometry software (SketchUp) to engineer, design, and create a model you can touch. Transformational geometry comes to life when students are allowed to dream!

Carl W. Lee
University of Kentucky, Lexington
Craig Schroeder
Fayette County Public Schools, Lexington, Kentucky

462 Triangle Treachery: Modeling with Mathematics
9–12 Burst
What happens to the area and perimeter of a triangle as one vertex is moved on a line? This engaging task will use notecards, technology, functions, modeling, and algebra to analyze this geometric context and to produce some surprising results. The mathematical practices and student learning and reasoning will be emphasized.

Bob Mann
Western Illinois University, Macomb, Illinois
Anita L. Reid
Lewistown CUSD #97, Illinois

463 A New Line Leader: Transformation Form of Linear Equations
9–12 Burst
When we ask our students for the equation of a line, we always hear $y = mx + b$. Come learn about the transformation form of a linear equation and how it is connected to graphical transformations, arithmetic sequences, and Euler’s method. This will help your students to understand families of functions and they are connected throughout the curriculum.

Josh Berberian
The Shipley School, Bryn Mawr, Pennsylvania
11:30 A.M.–12:00 P.M.

**465**
Enhancing Social Presence in Online Math Methods Courses
Higher Education Burst
This session will focus on a study designed to compare methods for increasing social presence in an online math methods course. Strategies for helping participants feel more connected will be shared. We will also explore issues related to environments with low social presence and how these issues impact mathematical teaching and learning.

Heidi J. Higgins
University of North Carolina Wilmington
Tracy Y. Hargrove
University of North Carolina Wilmington

212 (BCEC)

**466**
Undergraduates Appreciate Mathematics through Reading and Writing in a Service-Level Course
Higher Education Burst
Informed by research on the topic at K–12 levels, successful integration of reading/writing into a problem-solving, service-level college math course is described. Preliminary pre-/post-course survey results suggest increased appreciation of mathematics by “non-math” majors. Sample student-written chapter reviews of a popular math book are given.

Daniel P. Wisniewski
DeSales University, Center Valley, Pennsylvania

102 A/B (BCEC)

12:30 P.M.–1:30 P.M.

**467**
Moving Principles into Actions: Leading Change in Mathematics Programs (Elementary)
Pre-K–2 Session
In *Principles to Actions*, NCTM sets forth a vision to support the goal of ensuring the mathematical success of all students. This session introduces professional learning resources designed to support teachers and other stakeholders as they strive to achieve the vision outlined in the principles, with a particular emphasis the elementary grades.

Melissa M. Soto
San Diego State University, San Diego, California
Francis (Skip) Fennell
Past President, National Council of Teachers of Mathematics; McDaniel College, Westminster, Maryland

103 (BCEC)

**468**
Barbie, Ken, and STEM: Adventures in Proportional and Logical Reasoning
General Interest Session
Projects/tasks in varying contexts (e.g., art, games) that advance student understanding of key math ideas and reasoning methods; prompt discussions, debate, and stick-to-itive-ness; and are memorable and delightful will be presented. The characteristics of these and how to construct them will be described.

Carole E. Greenes
Arizona State University, Tempe

153 C (BCEC)

New to Teaching? Get answers to pivotal questions and concerns of new and soon-to-be teachers at the New Teacher Strand on Thursday and Friday.
### 469 Changing the World for Students with Special Needs

**General Interest Session**

Alex says, “It took a stroke and a coma but now I like math!” Students with special needs are often taught exclusively through key words and direct instruction. Alex, who has special needs, and her mother Juli Dixon share how they successfully replaced key words and direct instruction with teaching for understanding in an inclusive setting.

Alex Dixon was a normal, bright, healthy girl when a sudden onset of a mysterious illness took over her life. Months of treatments failed to provide relief from acute pain and muscle spasms. Doctors across the country were at a loss. A last attempt at treatment—brain surgery—stopped the spasms but caused a massive stroke. At age twelve, Alex had to relearn everything. Now seventeen, Alex shares her story and her amazing recovery. She provides a personal account of strategies for supporting a student with special needs to learn mathematics with depth.

Juli Dixon, Alex’s mom, is a professor of mathematics education at the University of Central Florida. A prolific writer, she has published numerous textbooks and articles as well as delivered keynote presentations throughout the United States. Juli used everything she knew about teaching and learning to “re-teach” Alex. Her perspectives on “what worked” are relevant to current issues in mathematics education in general as well as to teaching students with special needs.

**Alexis P. Dixon**  
Student, Oviedo, Florida  
**Juli K. Dixon**  
University of Central Florida, Orlando

**BALLROOM WEST (BCEC)**

### 470 Concrete-Pictorial-Abstract: Singapore’s Approach to Math Instruction

**General Interest Session**

Singapore’s students have excelled in international studies of math performance. The concrete-pictorial-abstract approach supports both conceptual understanding and procedural fluency. Abstraction gives math its power, but must be based on understanding. We’ll consider examples from place value, operations, problem solving, and even calculus.

**Richard Bisk**  
Worcester State University, Massachusetts

**258 A (BCEC)**

### 471 NCTM Business Meeting

**General Interest Session**

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

**Diane J. Briars**  
President, National Council of Teachers of Mathematics, Reston, Virginia

**157 A (BCEC)**

### 472 Powerful Practices That Strengthen Mental Math

**General Interest Session**

A balanced math program builds students’ computational skills. Mental math is a critical skill, yet often does not receive the attention it deserves. This session will show strategies to strengthen students’ mental math capacity. These practices give students the opportunity to develop effective computational strategies based on number sense.

**Pam Palmer**  
Houghton Mifflin Harcourt, The Leadership and Learning Center, Englewood, Colorado  
**Kathleen A. Wilson**  
St. Paul Public Schools, St. Paul, Minnesota

**210 B (BCEC)**
12:30 P.M.–1:30 P.M.

**473**
**The Essential Elements of Effective Math Programs**

General Interest Session

As outlined in *Principles to Actions*, teaching is the non-negotiable core to ensure all students learn mathematics at high levels. However, effective teaching must be supported by certain conditions and structures. This session will examine the five essential elements of effective math programs and link them to effective practices and action steps.

Matthew Larson
Lincoln Public Schools, Nebraska

**BALLROOM EAST (BCEC)**

**474**
**Transforming Practice: Organizing Schools for Meaningful Teacher and Leader Learning**

General Interest Session

Almost all teachers participate in professional learning communities. What makes collaborative work impactful for teachers and adults in schools? How do you create coherence in mathematics instructional practices across an entire school? This presentation focuses on innovative ways of transforming how teachers work together.

Elham Kazemi is a professor of mathematics education and associate dean for professional learning at the University of Washington. She loves to learn about children's mathematical thinking, working side-by-side with teachers to develop thriving learning communities for teachers and students alike. She studies how schools can be organized for meaningful learning opportunities for teachers, leaders, and students. This work is informed by equity-oriented research on organizational learning, children's mathematical thinking, and classroom practice. Her recent book co-authored with Allison Hintz, Intentional Talk, focuses on leading productive discussions in mathematics.

Elham Kazemi
University of Washington, Seattle
Allison Hintz
University of Washington Bothell
Lynsey Gibbons
University of Washington, Seattle

**GRAND BALLROOM B (WESTIN)**

**475**
**Video Club: A Tool to Support Students’ Mathematical Practices**

Preservice and In-Service Session

A video club is a regular meeting of teachers to watch, analyze, and discuss video from their own classrooms. The session will describe the organization and execution of a video club of math teachers that focused on students’ use of the mathematical practices outlined in the Common Core State Standards.

William L. Day
Math for America DC, Washington, D.C.

**203 (BCEC)**

**476**
**Number Sense Magic for Pre-K–1 Learners**

Pre-K–2 Session

A fast-paced, hands-on application of research and brain-based strategies to build number sense in pre-K–1 learners. Participants will use sample manipulatives, research-proven games, math talk, and exemplars of number sense strategies that build a strong number sense for conceptual understanding and procedural fluency in young children.

Ken Newbury
Bowling Green State University, Ohio

**106 (BCEC)**

**477**
**Simplifying Strategies: Look for and Make Use of Structure**

Pre-K–2 Session

“Why can’t they just use the algorithm?” some teachers ask. Learn how models such as number bonds and strategies like make a ten and compensation work in support of, not in place of, the addition and subtraction algorithm. Help students discover the magical ways numbers make sense and how to reason about number relationships before choosing a way to solve.

Lisa A. Watts Lawton
Curriculum Associate, Common Core, Inc.; Gardner Elementary School, Los Angeles, California
MaryJo Wieland
Curriculum Associate, Common Core, Inc., Montvale, New Jersey

**159 (BCEC)**
12:30 P.M.–1:30 P.M.

**478  **
**Math Strategies and Resources for Teaching English Language Learners**

*3–5 Session*

Enrich your tool kit with successful strategies and resources for teaching mathematics to English language learners (ELL) in elementary school. Learn about our experience participating in a grant involving a partnership between Roger Williams University and Providence public schools to enhance teaching mathematics to ELL students.

*Margaret Thombs*
Roger Williams University, Bristol, Rhode Island

*Jenny K. Tsankova*
Roger Williams University, Bristol, Rhode Island

211 (BCEC)

**479  **
**Create a Thinking Math Class**

*3–5 Session*

Create a classroom where thinking and reasoning are constants. Provide quality starters and meaningful independent task time activities for all to be involved in problem solving and communication. Focus on mathematics as a language and ensure that reasoning occurs in daily math experiences.

*Marcy Cook*
Consultant, Balboa island, California

GRAND BALLROOM A (WESTIN)

**480  **
**Gauging Student Understanding through Self-Assessments, Cover Sheets, and Retakes**

*3–5 Session*

How can you help students assess and monitor their understanding? How can you help students see success and growth? How can you hold students accountable for demonstrating proficiency with all course content? See how you can use self-assessment, cover sheets, and retakes as tools to make assessment an integral part of the learning process.

*Frankie J. Bruning*
Parkway School District, Chesterfield, Missouri

*Amanda K. Schweissguth*
School District of Washington, Washington, Missouri

108 (BCEC)

**481  **
**Reflections on Equity: My Classroom as a Research Lab**

*3–5 Session*

As a fifth-grade teacher, action research allowed me to explore new ideas to build my reflective teaching practices and improve equity overall, specifically in mathematics. This process identified mathematically talented students previously overlooked and promoted gender equity within the classroom. Learn from my journey of research and reflection.

*Heather Lindfors-Navarro*
Chandler Unified School District #80, Chandler, Arizona

254 A/B (BCEC)

**482  **
**Creating the Conditions for Critical Thinking**

*6–8 Session*

Explore how developing student’s capacity in nonstandard or inquiry-based problems can foster the skills described in the Common Core’s mathematical practices as well as other important learning traits such as perseverance, accountable math talk, critical thinking, as well as the ability to identify, and connect to the underlying big ideas.

*Lisa T. Pilgrim*
Halton District School Board, Burlington, Canada

*Bridget V. Goodwin*
Halton District School Board, Burlington, Canada

253 B (BCEC)

**483  **
**Exercise a Big Mac Away: Ratios, Rates, and Proportions in Context**

*6–8 Session*

The CCSSM standards state that students should “use ratio and rate reasoning to solve real-world and mathematical problems.” We will share a task centered on an authentic context—the nutritional content of a Big Mac and how to exercise its calories away. Students build not only individual concepts of ratios, rates, and proportions, but also the connections among them.

*S. Asli Ozgun-Koca*
Wayne State University, Detroit, Michigan

*Thomas G. Edwards*
Wayne State University, Detroit, Michigan

DOUGLASS (WESTIN)
12:30 P.M.–1:30 P.M.

484  
**Fraction Fluency: Helping All Students Become Part of the Whole**  
*6–8 Session*  
Fluency with fractions has been identified as the most foundational skill for learning algebra. Even after excellent instruction, many students will still struggle with fraction concepts. Join us to learn about fractional fluency interventions that help middle school students overcome their difficulties with fractions. 

Joann Barnett  
Missouri State University, Springfield, Missouri  
Trish Alexander  
Fulton Middle School, Fulton, Missouri

485  
**Supporting Critical and Creative Thinking Tools for English Language Learners**  
*6–8 Session*  
In this session, participants will learn instructional strategies that support English language learners in middle school math while promoting critical and creative thinking through the NCTM process standards. Teachers will experience engaging activities they can take and use with their students right away that support content and skill development. 

Erin Sylves  
Fairfax County Public Schools/TODOS: Mathematics for All, Virginia  
Rose Moore  
Fairfax County Public Schools, Virginia

486  
**Supporting Middle School Students with MP.3**  
*6–8 Session*  
How can teachers support students enact the Standards for Mathematical Practice? How can we engage students in discourse where they will “construct viable arguments and critique the reasoning of others”? In this session, we will focus on these questions around MP.3. Teachers will examine student work and video for ways to support students in articulating their mathematical ideas. 

Katie Salguero  
WestEd, Redwood City, California  
Angela Knotts  
WestEd, Redwood City, California

487  
**Flipping Outliers! Achievement for ELLs and Students with Special Needs**  
*9–12 Session*  
The “flipped class” has received much recent acclaim. It is often overlooked how the model inherently includes significant supports for ELLs and students with special needs. Rejecting the notion of “outliers,” we will provide teachers with strategies and methods to use the “flipped classroom” model to increase understanding and achievement for all students. 

Eric R. Schoonard  
Franklin Academy, East Haddam, Connecticut

488  
**Cryptography Using Linear Functions and Their Inverses**  
*9–12 Session*  
Students can code and decode messages using linear functions and their inverses. This type of cryptography is very exciting and accessible to algebra students with a simple introduction of modular arithmetic. Learn how to do this with your students and see what students from an actual algebra classroom were able to do. TI-Nspire will be used. 

Kara L. Leaman  
Unity High School, Tolono, Illinois  
Ann M. Schlemper  
Columbia College, Columbia, Missouri
12:30 P.M.–1:30 P.M.

489
**Essential Tools for My Flipped Math Classroom**

9–12 Session
Explore a “flippers” toolbox. Learn about the practices and tools a high school math teacher uses in his flipped classroom. You too can have an effective flipped classroom in just a few steps.

Daniel D. Muscarella
Loudoun County Public Schools, Ashburn, Virginia

252 B (BCEC)

490
**Teaching Logarithms for Understanding**

9–12 Session
Logarithms are one of the most dreaded, and least meaningful, topics in the high school curriculum. Logarithms would make more sense if we helped students understand why logarithms were invented, how they were useful for simplifying computations, and how they continue to be useful in statistics.

Michael Manganello
Downingtown Area School District, Pennsylvania
David R. Miller
West Chester University, Pennsylvania

161 (BCEC)

491
**Geometric Habits of Mind: How Do We Encourage Their Development?**

Higher Education Session
How do students visualize, construct, and reason geometrically? Using ideas from Driscoll’s *Geometric Habits of Mind* (2007) as a foundation for activities and thinking, the presenter will share ways college students built their framework for developing geometric habits of mind and understanding mathematics.

Phyllis B. Bolin
Abilene Christian University, Texas

160 A (BCEC)

492
**Structure of Mathematics Textbooks: Implications for Humanized Mathematics Teaching**

Higher Education Session
Humanizing mathematics teaching implies emphasising mathematical processes as against the products, that is making mathematics activity based. This research evaluates the structure of four textbooks in use in secondary schools for humanized teaching of geometry.

Esther Ngozi Odafe
University of Benin, Benin City, Nigeria
Lucy Eraikhuemen
University of Benin, Benin City, Nigeria

209 (BCEC)

493
**What’s My Distribution?**

9–12 Session
In this session we will explore probability using distributions. We’ll look at computation, graphs, and simulation. Examples will include geometric, binomial, hypergeometric, and normal distributions and will describe connections and differences between them. Additional examples will provide an introduction to the negative binomial and Poisson.

John J. Diehl
CTAC, Plano, Texas

104 C (BCEC)

494
**Distribution and Average: Deepening Common Core Statistical Knowledge for Teaching**

Preservice and In-Service Session
Explore statistical concepts of distribution and average and students’ thinking about the concepts through a series of hands-on, cognitively demanding tasks. Consider ways to represent, summarize, and describe data to develop understandings of the foundational statistical concepts of average and distribution, and learn how to teach the concepts.

Susan A. Peters
University of Louisville, Kentucky
Jonathan D. Watkins
University of Louisville, Kentucky

260 (BCEC)
12:30 P.M.–1:30 P.M.

494.1 **Think Math II! Computational Fluency and Algebra Starting at Kindergarten**

Pre-K–5 Exhibitor Workshop

Our interactive presentation with classroom video will show how sorting and finger play in kindergarten, adding in second grade, number tricks in fourth grade—and lively focused mental practice throughout—build fluent mental mathematics early and the language of algebra by grade 6. Think Math II! nails Common Core practice standards with grade-level content.

**Education Development Center**

Waltham, Massachusetts

105 (BCEC)

494.2 **enVisionmath2.0**

Pre-K–5 Exhibitor Workshop

Experience how problem-based learning through math practices uniquely develops the depth of understanding and rigor needed for success on high-stakes tests.

**Pearson**

Upper Saddle River, New Jersey

151A (BCEC)

494.3 **Filling Knowledge Gaps with Critical Singapore Math Approach**

3–5 Exhibitor Workshop

During Singapore Math implementation, gaps in student knowledge can be a challenge. Upper elementary students frequently lack the foundation provided by the first- to third-grade Singapore Math Curriculum. In this session, you’ll learn the classroom-tested critical lessons and concepts students must master before jumping into their grade-level content.

**Singapore Math, Inc.**

Tualatin, Oregon

153A (BCEC)

494.4 **Read It, Write It, Solve It: Improving Content-Area Literacy and Problem Solving**

3–5 Exhibitor Workshop

Help students communicate their mathematical thinking and understanding with content-rich reading, writing, and problem-solving experiences. Join us and get empowered as we offer practical, easy-to-use strategies to support students as they read, write, solve, and explain their mathematical content knowledge.

**Teacher Created Materials**

Huntington Beach, California

152 (BCEC)

494.5 **CCSS Math Practices? Trust CPM’s 25 Years of Writing Experience!**

6–8 Exhibitor Workshop

Experience the mathematical practices embedded in lessons that include problem solving and discourse. The Core Connections series embeds the practices daily in a problem-based, student-centered CCSS-aligned curriculum for grade 6–algebra 2 (option for high school Integrated I-III.) Receive free copies of CPM’s entire Core Connections series.

**CPM Educational Program**

Sacramento, California

153B (BCEC)

494.6 **An Introduction to the New High School Integrated Math Series**

9–12 Exhibitor Workshop

The Big Ideas Math Integrated Mathematics I, II, and III editions were written by renowned authors Ron Larson and Laurie Boswell. The research-based program contains a continual development of concepts that have been previously taught while integrating algebra, geometry, probability, and statistics topics throughout each course.

**Houghton Mifflin Harcourt**

Boston, Massachusetts

151B (BCEC)
1:00 P.M.–2:15 P.M.

495
**Exploring Geometry and Measurement through Children's Literature**
*Pre-K–2 Gallery Workshop*

See how geometry ideas and measurement ideas come alive in children’s books. Engage in rich mathematical tasks that explore shapes, location, movement, symmetry, and length.

Kay A. Wohlhuter
University of Minnesota Duluth

**COMMONWEALTH A-B (WESTIN)**

496
**On a Roll to Mastering Place Value**
*Pre-K–2 Gallery Workshop*

Come prepared to play games that incorporate the use of cards, number lines, and dice. Activities will focus on the following Common Core State Standards: naming, ordering, comparing numbers, learning pattern and benchmark strategies on 100’s and 1,000’s number lines, and intro rounding and expanding concepts. Hands-on strategies, student samples, and game boards will be provided.

Julie Knudson
Trinity Valley School, Fort Worth, Texas
Jane Felling
Box Cars and One-Eyed Jacks, Edmonton, Canada

**252 A (BCEC)**

497
**The Transmedia Approach to Teaching Math**
*Pre-K–2 Gallery Workshop*

Join Boston University and PBS KIDS in exploring transmedia storytelling in educational media, aligned to the Common Core State Standards for Mathematics, to advance children’s mathematics learning. Experience how a single story line can weave through multiple platforms (video, online, and hands-on activities) to engage students and reinforce learning.

Jeanne R. Paratore
Boston University School of Education, Massachusetts
Alejandra Salinas
Boston University, Massachusetts
Allison D. Fermetta
Chelsea Public Schools, Massachusetts

**104 A/B (BCEC)**

498
**Putting Values in Their Place: Understanding Struggles with Place Value**
*Preservice and In-Service Gallery Workshop*

Experience numbers like a student again! Participants will build conceptual knowledge of place value. We’ll use manipulatives as we seek to understand and operate with a new number system. Through this experience, you will gain insight to your students’ thinking as they learn the meaning of numbers and how to operate with them.

Jill Swissa
Carnegie Learning, Pittsburgh, Pennsylvania
Kelly Edenfield
Carnegie Learning, Pittsburgh, Pennsylvania

**205 C (BCEC)**

499
**Advancing with Number Talks K–2: Building Deeper Understanding**
*Pre-K–2 Gallery Workshop*

Number Talks are a powerful tool, fundamental in developing students’ computational fluencies with conceptual understanding. For teachers currently incorporating Number Talks, this session will focus on extending the classroom routine to deepen students’ mathematical understandings through accountable math talk and challenging problem sequences.

Nancy L. Thomburg
Cape Henlopen School District, Lewes, Delaware
Kristin N. Gray
Cape Henlopen School District, Lewes, Delaware

**109 A/B (BCEC)**

500
**Applying Mathematics in Real-World, Hands-On STEM Problems**
*3–5 Gallery Workshop*

Apply mathematics in real-world, hands-on STEM problems to promote your students’ understanding, reasoning, and problem-solving skills. Participants will work through a sample design task and will be provided with additional lesson ideas and a planning guide to help them take what they have learned and put it into practice.

Elizabeth Gajdzik
Purdue University, West Lafayette, Indiana

**206 A/B (BCEC)**
1:00 P.M.–2:15 P.M.

501
Making Sense of the Number Line Model for Fractions
3–5 Gallery Workshop
The Common Core challenges third graders to make sense of the number line as a model for fractions. Current research from the Rational Number Project has led to a better understanding of the role the number line model can play in fraction learning, student difficulties with the number line, and instructional strategies for overcoming these difficulties.

Kathleen Cramer
University of Minnesota, Minneapolis
Sue Ahrendt
University of Wisconsin-River Falls
Bethann Wiley
University of Minnesota, Minneapolis

502
Number Sense Approach to X Facts: Critical to Common Core
3–5 Gallery Workshop
Experience a systematic approach to teaching basic facts that encourages reasoning while building fluency. Counting tapes with multiple markers and unique array flash cards builds concepts and connections between x, +, and fractions. Designed for use schoolwide in classrooms and after school. Materials provided.

Janet Gillespie
Retired, Portland Public Schools, Oregon

503
Small Group Math Stations: Fraction Action for All
3–5 Gallery Workshop
Experience a differentiated math station structure that allows for independent learning and provides the teacher time to work with students in a small group setting. Participants will experience fractions activities from CCSSM but the structure will work with all concepts. The focus of the activities is to develop conceptual understanding.

Renee’ Smith
ESSDACK, Hutchinson, Kansas
Tammy Fellers
ESSDACK, Hutchinson, Kansas

504
Developing Understanding of Multiplication of Fractions: Research into Practice
3–5 Gallery Workshop
We will explore what it means for students to develop a conceptual understanding of multiplication of fractions, examine factors that aid or hinder the development of this understanding, and explore ways to help students understand multiplication of fractions. Research results that have been put into practice will guide our explorations.

Nancy K. Mack
Grand Valley State University, Allendale, Michigan

505
Al Capone Does My Math: Investigations via Literature
6–8 Gallery Workshop
Inspire! Explore! Collaborate! Solve! Engage in hands-on math activities with characters and contexts from middle-level literature. Each investigation is aligned to CCSSM.

Donna Christy
Rhode Island College, Providence
Christine Payson
North Cumberland Middle School, Rhode Island

506
Connecting Proportional Reasoning and Algebraic Thinking
6–8 Gallery Workshop
Understanding multiplicative relationships and reasoning proportionally is essential to students’ success in algebra. Participants will engage in hands-on activities designed to develop proportional reasoning at a concrete level and make explicit connections to algebraic thinking. TI-Nspire technology will be used to explore these connections.

Gloria Beswick
Independent Consultant/Teachers Teaching with Technology, Louisville, Kentucky

204 A/B (BCEC)

156 A/B (BCEC)

257 A/B (BCEC)
507
Investigating the Pythagorean Theorem and Its Proofs
6–8 Gallery Workshop
With the advent of the Common Core State Standards for Mathematics, it has become necessary to develop an understanding of the Pythagorean theorem in middle school. Participants will investigate several proofs of the Pythagorean theorem using a variety of tools and will use what they have learned to apply the theorem to real-world situations.

Robyn W. Carlin
Louisiana State University, Baton Rouge

508
Percent: From Elastic to a Double-Sided Number Line
6–8 Gallery Workshop
How do we take our students beyond procedures and surface-level understanding of percent? Come stretch elastic to understand the concept of percent as defined by CCSSM. Participants will be engaged through the use of manipulatives, hands-on activities that are classroom ready, as well as discourse strategies to support language development.

Janna Canzone
University of California, Irvine
Karajean Hyde
University of California, Irvine
Kris Houston
University of California, Irvine

Strengthen Your Teaching, Your Students’ Learning
Principles to Actions: Ensuring Mathematical Success for All
What it will take to turn the opportunity of the Common Core into reality in every classroom, school, and district.
Continuing its tradition of mathematics education leadership, NCTM has undertaken a major initiative to define and describe the principles and actions, including specific teaching practices, that are essential for a high-quality mathematics education for all students.
This landmark publication offers guidance to teachers, mathematics coaches, administrators, parents, and policymakers:
• Provides a research-based description of eight essential Mathematics Teaching Practices
• Describes the conditions, structures, and policies that must support the Teaching Practices
• Builds on NCTM’s Principles and Standards for School Mathematics and supports implementation of the Common Core State Standards for Mathematics to attain much higher levels of mathematics achievement for all students
• Identifies obstacles, unproductive and productive beliefs, and key actions that must be understood, acknowledged, and addressed by all stakeholders
• Encourages teachers of mathematics to engage students in mathematical thinking, reasoning, and sense making to significantly strengthen teaching and learning

For more information or to place an order, please call 800.235.7566 or visit www.nctm.org/catalog.
1:00 P.M.–2:15 P.M.

509
Creating and Sharing Mathematics through Puzzle Apps: In School and Out
6–8 Gallery Workshop

Creating and solving mathematics puzzles encourages creativity and perseverance. See how several NSF-funded puzzle apps support numerical, logical, and algebraic reasoning. Learn how to use these research-based materials to engage all students in mathematical reasoning, in and outside of school. Please bring an Internet-enabled device.

Mary K. Fries
Education Development Center, Waltham, Massachusetts
Jane M. Kang
Education Development Center, Inc., Waltham, Massachusetts
E. Paul Goldenberg
Education Development Center, Inc., Waltham, Massachusetts

253 A (BCEC)

510
Hooked on Modeling
9–12 Gallery Workshop

Experience full-filled activities that will have your students hooked on modeling! The presenter will engage participants in gathering real-world data and representing it graphically and algebraically. Come see how to take classic problems and find and represent the math hidden beneath the surface! Resources will be shared.

Richard Quiroz
Loara High School, Anaheim, California
Susanna Meza
Valadez Middle School Academy, Placentia, California
Thomas Duarte
Anaheim Union High School District, Anaheim, California

210 C (BCEC)

511
Thinking Like a Synthesizer: Applying Algebraic Transformations to Musical Melodies
9–12 Gallery Workshop

Every song’s melody can be expressed as a series of integers, each of which represents the number of musical half-steps above or below the first note in the song. Using various basic math and music technologies, we will create discrete graphs that we can transform horizontally and vertically—just like composers and synthesizers do!

Mike J. Reiners
Christ’s Household of Faith School, St. Paul, Minnesota
Bob Horton
Clemson University, Clemson, South Carolina

GRAND BALLROOM E (WESTIN)

512
Hooked on Conics Worked for Me
9–12 Gallery Workshop

Hands-on teaching approaches make conics come to life. Using wax paper, Wikki Stix, cheese, thumbtacks, flashlights, and string, all students can investigate conics. This promotes conceptual understanding and connections between two and three dimensions. Technology and trigonometry will help us verify that we can generate the same curve in 2-D and 3-D.

Lauren Jeneva Moseley
Lee University, Cleveland, Tennessee
Jeremy Robert Newton
Lee University, Cleveland, Tennessee
Jonathan Matthew Clark
Lee University, Cleveland, Tennessee

107 B/C (BCEC)

The NCTM Member Services, located inside NCTM Central in the Exhibit Hall, has activities, lessons, sample journals, and more—Stop by!
1:00 P.M.–2:15 P.M.

513 Reaching and Teaching English Language Learners Using the SIOP® Model
9–12 Gallery Workshop
How can we support the ELLs in our classroom while engaging all of our students? Join us to find out! We’ll share twenty research-based activities, developed in our years of implementing the SIOP model. By making your own Graffiti Wall, Quizzes Without Questions, and more, you’ll discover fun ways to help all of your students experience mathematical success.

Lori A. Keleher
Huron School District 2-2, South Dakota
Lindsey L Brewer
Huron School District 2-2, South Dakota

514 Beyond Bells and Whistles: Evaluating and Designing Dynamic Geometry Tasks
9–12 Gallery Workshop
Ever used dynamic geometry software to engage your students, and come away feeling like it added little to the lesson? Wonder how to use technology to deepen students’ understanding? Come to this presentation and learn to design DGS tasks that will get your students thinking. Bring your laptop with either GeoGebra or Geometer’s Sketchpad.

Charity Cayton
East Carolina University, Greenville, North Carolina
Milan Sherman
Drake University, Des Moines, Iowa
Kayla Chandler
North Carolina State University, Raleigh

515 TL Reasoning Abstractly and Quantitatively with Conic Sections
9–12 Gallery Workshop
To “reason abstractly and quantitatively” students must decontextualize and contextualize in a mathematical situation. Aided by the TI-Nspire, we will explore how this standard for mathematical practice might play out as students explore definitions of and formulas for different conic sections in Euclidean, Taxi Cab, and Chinese Checkers geometries.

Bethany Noblitt
Northern Kentucky University, Highland Heights

516 The Students in Front of You: Making Cultural Relevance Work!
Preservice and In-Service Gallery Workshop
Question: Teaching culturally relevant mathematics “for whom?” Answer: The students in front of you. In this session we will use the Culturally Relevant Cognitively Demanding (CRCD) framework rubric to create and revise mathematics tasks. Presenters will also share how inservice teachers have used the CRCD rubric to select tasks for classroom use.

Shelly M. Jones
Central Connecticut State University, New Britain, Connecticut
Yolanda A. Parker
Tarrant Count College, Fort Worth, Texas

517 “They’ll Need It for High School”
Preservice and In-Service Gallery Workshop
Some math topics can be emphasized, and teaching practices justified, all in the name of preparing students for high school. We’ll classify and critique some typical responses to “What do students need for high school?”, discuss more promising answers to this question, and explore activities that will truly help our students succeed in math class.

Chris Hunter
School District No. 36 (Surrey), Surrey, Canada
Marc Garneau
Education Services, Surrey School District, Surrey, Canada
2:00 P.M.–3:00 P.M.

518
Moving to Action: Effective Teaching Practices in the Secondary Grades
9–12 Session
This session features the new (and free) NCTM materials to support and focus professional learning on the research-based teaching practices in Principles to Actions. Engage in analysis of effective mathematics teaching using video cases and resources from selected modules, and then continue the conversation with colleagues back in your districts.

Melissa D. Boston
Duquesne University, Pittsburgh, Pennsylvania
Stephen W. Miller
Institute for Learning, Learning Research and Development Center, University of Pittsburgh, Pennsylvania

519
Creating a Connected Curriculum: Building Bridges between Key Topics
General Interest Session
Mathematics instruction is not just about discrete content topics, but also about connections. Teachers must create and teach a connected curriculum that bridges key topics in the Common Core State Standards (e.g., whole numbers, measurement, the number line, and fractions), uniting them in coherent learning progressions.

Roger E. Howe
Yale University, New Haven, Connecticut
Yeping Li
Texas A&M University, College Station

520
Future of Learning: The National Science Foundation’s Focus on Mathematics
General Interest Session
The National Science Foundation is “where discoveries begin.” Hear about how NSF investments lead to discoveries to improve mathematics learning and teaching. See the latest NSF-supported new technologies, digital games, online learning, citizen science, big data, scaling-up, research, and other resources to help students learn mathematics.

Joan Ferrini-Mundy
National Science Foundation, Arlington, Virginia
Karen D. King
National Science Foundation, Arlington, Virginia

521
Improving Math with Your PLC: The Power of Formative Assessments
9–12 Session
How do we empower our PLC to improve math achievement by looking at both the causes of math performance and the results? How do we build short formative assessments to give us the data to improve our teaching and learning? In this session, attendees will walk through the process of using PLCs to improve math teaching and learning.

Juan Cordova
The Leadership and Learning Center, Denver, Colorado
Angela B. Peery
The Leadership and Learning Center, Englewood, Colorado

522
My Favorite Math Fun Facts
General Interest Session
President’s Series presentation
For many years, I have been collecting “Math Fun Facts,” cool ideas that can be presented quickly, from any area of math, meant to arouse my students’ curiosity and show that math is full of beautiful ideas, patterns, and ways of thinking. In this talk, I will present my favorite Math Fun Facts. Will they be your favorites? You decide.

Francis Edward Su
Harvey Mudd College, Claremont, California
2:00 P.M.–3:00 P.M.

523  
**Policy, Curriculum, Teacher Professionalism toward Effective Teaching: Why Korea Succeeded**  
General Interest Session  
Learn about findings from the Joint Workshop that the U.S. National Commission on Math Instruction held with forty experts from Korea and the United States. See a comparison of such topics as teacher preparation, PD, textbooks, teaching practices, curriculum development, online resources for teachers and students, and developing teacher/school evaluation systems.

Myong-Hi Kim  
SUNY At Old Westbury, New York  
James Barta  
Bemidji State University, Bemidji, Minnesota  
Oh Nam Kwon  
Seoul National University, Seoul, South Korea

210 B (BCEC)

524  
**So You’re Saying “Smarter Balanced” Isn’t a Testing Company?**  
General Interest Session  
In this session, a panel of educational leaders from across Smarter Balanced states will describe the deep involvement of educators at all levels in the development of the assessment system. Participants will gain new insights into building a collaborative working model that supports progress toward a shared vision for mathematics education.

Shelbi Cole  
Smarter Balanced Assessment Consortium, Olympia, Washington  
Tracy Gruber  
Nevada Department of Education, Carson City, Nevada  
Gail Pagano  
Connecticut State Department of Education, Hartford, Connecticut

203 (BCEC)

525  
**Teaching Mathematics to ELLs: Is It Just Good Teaching?**  
General Interest Session  
Providing access to mathematics for ELLs requires more than good instructional strategies. This session will focus on guiding principles and instructional strategies that are imperative to use if ELLs are to have access to high-quality mathematics, develop the mathematical practices, and enhance their language skills.

Nora G. Ramirez  
TODOS: Mathematics for ALL, Tempe, Arizona

258 A (BCEC)

526  
**Using Flipped Learning to Significantly Improve Mathematics Instruction**  
General Interest Session  
Dr. Overmyer is one of the pioneers of flipped learning and an experienced mathematics teacher, and he will share how instructors worldwide are using tenets of flipped learning to create active, dynamic inquiry and collaborative mathematics classrooms. This presentation will show pragmatic steps teachers can use to improve their mathematics teaching.

Jerry R. Overmyer  
University of Northern Colorado, Greeley

260 (BCEC)

Pick-up a copy of the onsite Daily News for up-to-date conference information!
2:00 P.M.–3:00 P.M.

527  What Decisions?
General Interest Session
Assessment should fit the decisions that need to be made, not the other way around. Teachers need a clear goal, but they must respond to whatever the students bring to the learning. The stepping stones from what they bring to the goal is what needs illuminating. We don’t need to amplify the two year old in the back seat asking “Are we there yet?”

Phil Daro served on the writing team of the mathematics Common Core State Standards. He is the lead designer, mathematics, for the Common Core System of Courses being developed by the Gates Foundation and the Pearson Foundation. He also leads the partnership of University of California, Stanford, and others with the Oakland and San Francisco Unified School Districts for the Strategic Education Research Partnership (SERP).

Previously, Daro was a Senior Fellow for Mathematics for America’s Choice and the executive director of the Public Forum on School Accountability; he also directed the New Standards Project and managed research and development for the National Center on Education and the Economy. Daro has directed large-scale teacher professional development programs for the University of California, including the California Mathematics Project and the American Mathematics Project.

Philip Daro
Pearson, Berkeley, California

GRAND BALLROOM A (WESTIN)

528  Assessing Mathematics In Early Childhood Is Neither Trivial Nor Obvious
Pre-K–2 Session
College and career-ready students will be the result of informed decision-making and higher-quality instruction, which requires a full integration of the learning and assessment systems. In this session we will explore the interplay of assessment—both formative and summative—and mathematics understanding in the K–2 mathematics classroom.

Harold Asturias
Lawrence Hall of Science, University of California, Berkeley

DOUGLASS (WESTIN)

529  Empowering Elementary Teachers to Develop Their Kids’ Mathematical Worlds
Pre-K–2 Session
In this presentation, we will explore: (1) the types of classroom learning environments that support students’ math learning, (2) activities that provide opportunities for all students to engage in meaningful mathematics, and (3) the different kinds of strategies that teachers can use to help to empower students to make sense of mathematical ideas.

Joy W. Whitenack
Virginia Commonwealth University, Richmond

254 A/B (BCEC)

530  Get on Track! Problem Solving through Stories, Games, and Play
Pre-K–2 Session
This session will focus on how number tracks (concrete number lines) can increase students’ understanding of equality, numbers, and place value. This flexible tool will help students solve problems presented in games, stories, and simulated play. Participants will receive game and lesson ideas that incorporate the CCSS Standards for Mathematical Practice.

Allison J. Davis
Chandler Unified School District, Arizona

161 (BCEC)

531  Mitigating Students’ Row by Column Structure within a Rectangular Array
Pre-K–2 Session
Elementary students’ ability to efficiently structure space within a rectangular array helps make connections to a variety of mathematical concepts. If we provide context and mitigate the representation of a composite unit, then we can assist students in developing this crucial understanding.

Keith Krone
Boise State University, Idaho
Jackie Ismail
Boise State University, Idaho
Michele Brown Carney
Boise State University, Idaho

FANEUIL (WESTIN)
2:00 P.M.–3:00 P.M.

532
Creative Strategies for Math at Home: Math Night Series
3–5 Session
Are you looking for ways for parents to support student learning at home? Come hear about a series of evenings in which we provided parents with tools and games. This purposeful, engaging series focused on vocabulary, the importance of mental math, and alternative algorithms. Walk away with materials to host a math series in your school.

Kelly Krownapple
Howard County Public Schools, Ellicott City, Maryland
Karen Simcock
Howard County Public Schools, Ellicott City, Maryland
Gretchen Gray
Howard County Public Schools, Columbia, Maryland

533
Rich Tasks and Teacher Actions That Support Effective Teaching Practices
General Interest Session
Principles to Actions provides teachers, coaches, and administrators with research-based teaching practices to ensure student learning. Let’s take a look at practical applications for the pre-K–5 classroom including tasks, talk, and techniques that exemplify the eight teaching practices.

Linda M. Gojak has served the National Council of Teachers of Mathematics in many roles, including as NCTM president, where she oversaw the development and publication in 2014 of Principles to Actions: Ensuring Mathematical Success for All. She has also served as president of the National Council of Supervisors of Mathematics, the Greater Cleveland Council of Teachers of Mathematics, and the Ohio Council of Teachers of Mathematics. The honors that Gojak has received include the Christofferson-Fawcett Award for Leadership in Mathematics Education from the Ohio Council of Teachers of Mathematics, and the Presidential Award for Excellence in Mathematics and Science Teaching.

Linda M. Gojak
Immediate Past President, National Council of Teachers of Mathematics; John Carroll University, University Heights, Ohio

534
Three Effective Uses of Unknown Student Work
3–5 Session
While there are many strategies for advancing students’ mathematical thinking, we have found that engaging students in the critical analysis of an unknown student’s work can be particularly useful. In this session, we will examine samples of student work as a means for thinking about three effective uses for unknown student work.

Natasha E. Gerstenschlager
Middle Tennessee State University, Murfreesboro
Angela T. Barlow
Middle Tennessee State University, Murfreesboro

535
Using Multicultural Mathematics Children’s Literature to Enhance Conceptual Understanding
3–5 Session
Come enter into the world of using authentic multicultural children’s literature to teach conceptual mathematics. Actual books, mathematics teaching ideas, and implemented lessons will be shared in a way to build culturally responsive teaching into your classroom through rigorous mathematics learning.

Jenni L. Harding-DeKam
University of Northern Colorado, Greeley
Boni Hamilton
University of Colorado Denver
Stacy Loyd
University of Northern Colorado, Greeley

536
Growing Multiplicative Thinking
6–8 Session
With the Common Core, multiplicative thinking formally begins in grade 3 and grows through the middle school grades and beyond. We will present activities to help students develop imagery for arrays, number lines, and the distributive property. Engage in activities and explore models and representations that you can use immediately in your classroom.

Meghan Hearn
Howard County Public Schools, Ellicott City, Maryland
Chadd McGlone
Teachers2Teachers-International, Chapel Hill, North Carolina
2:00 P.M.–3:00 P.M.

537 Quality Questioning for Effective Mathematics Teaching
6–8 Session
What is quality questioning? How can you ask questions for effective mathematics teaching? What questioning strategies can you use to develop mathematical thinking and to formatively assess students? Come to this session to find out how you can ask quality questions across all mathematical strands and ensure mathematical success for all students.

DesLey V. Plaisance
Nicholls State University, Thibodaux, Louisiana

538 Integrating Multiple Concepts in a Mathematical Task
6–8 Session
Real-world problems do not occur in aligned units. Knowledge of multiple concepts may be needed to solve the problem. Also, students often see mathematics concepts as unconnected. This session will demonstrate how multiple concepts can be integrated into one task, while providing opportunities to engage in several of the CCSS mathematical practices.

Desha L. Williams
Kennesaw State University, Georgia

539 Teaching Middle School Math through Real-World Topics
6–8 Session
Is Wheel of Fortune rigged? Do taller sprinters have an unfair advantage? Who should buy health insurance? We’ll explore a range of real-world lessons that teachers can immediately use to address Common Core standards in fresh ways, ones that foster a rigorous understanding of math, while challenging students to think critically about the world.

Matt Lane
Mathalicious, Charlottesville, Virginia
Karim K. Ani
Mathalicious, Charlottesville, Virginia

540 Translanguaging: Teachers’ Use of Two Languages in Latino Mathematics Classrooms
6–8 Session
In this session, we will share research results on how translanguaging (the strategic use of two languages) is used by middle school teachers in South Texas to enhance their students’ understanding of the mathematical content. Additionally, we will show videos illustrating this practice, and we will discuss if it can be implemented in different settings.

Carlos Mejia Colindres
Texas State University/TODOS: Mathematics for All, San Marcos
M. Alejandra Sorto
Texas State University/TODOS: Mathematics for All, San Marcos
Rachel Bower
Texas State University/TODOS: Mathematics for All, San Marcos

541 Using Discourse and Tasks to Uncover Student Thinking
6–8 Session
What our students know and don’t know is often left uncovered. Students today are required to construct viable arguments and critique the reasoning of others. In this session, strategies for uncovering student understanding through the use of academically productive discourse as well as tasks that allow for discourse are explored.

Genni Steele
Math Solutions, Sausalito, California
Michelle Spiers
Math Solutions, Sausalito, California

542 Teacher Collaboration in Student Tasks Creation: An Inquiry Process
Research Session
Through our research work (Collaborative Teacher Inquiry Project) with eighty grade 8 teachers, we explored and developed strategies that assisted teachers in creating student tasks as a team. Here, we outline some of the factors that contributed to successful collaborations, and we provide participants with samples of teacher-created student tasks.

Douglas E. McDougall
University of Toronto, Canada
Mimi Kam
University of Toronto, Canada
2:00 P.M.–3:00 P.M.

543
Teaching High School Algebra: What Works Clearinghouse Practice Guide
9–12 Session
The What Works Clearinghouse's latest practice guide offers educators evidence-based recommendations on how to teach algebra to students in grades 6–12. The recommendations, developed by an expert panel and based on rigorous research, provide clear instructional guidance, present examples to use in class, and discuss solutions to common problems.

Jane Porath
Board of Directors, National Council of Teachers of Mathematics; Traverse City Area Public Schools, Michigan
Matthew Larson
Lincoln Public Schools, Nebraska

GRAND BALLROOM B (WESTIN)

544
Establishing a Culture of Perseverance
9–12 Session
One of our most important jobs as math educators is to challenge students to persevere through lengthy or challenging problems. To do this, teachers must promote an environment where persistence in problem solving is extremely valued. This session will focus on strategies teachers can use to establish a culture of perseverance in their classrooms.

Hannah Schuchhardt
George Westinghouse College Prep, Chicago Public Schools, Illinois
Donna Ivanisevic
Chicago Public Schools, Illinois

545
Locating Outliers and Influential Points Using Regression Analysis and Technology
9–12 Session
This session will focus on the common methods which are used to detect outliers and influential points in data sets. Participants will use examples along with technology to determine the equation of the regression line, and then plot the regression line with and without the influential point(s) being included in the data set.

James Graziose
Palm Beach State College, Boca Raton, Florida

546
Reasoning Revision Revolution
9–12 Session
In math class students are taught that first draft equals final draft. Fail. Move on. We will share results that show that students, when given regular opportunities to get feedback and revise, can make improvements in their ability to communicate their reasoning. It is time to spark a reasoning revolution through the critical tool of revision.

Patrick Callahan
University of California, Los Angeles
Jessica Murk
Windsor Unified School District, Windsor, California

547
What Every High School Teacher Needs to Know about Statistics
9–12 Session
Four understandings essential to teaching the statistics content in the Common Core will be explored. These include the difference between statistical thinking and mathematical thinking, the role of variability, the difference between sample variability and sampling variability, and what it means to “rule out chance.”

Roxy Peck
California Polytechnic State University, San Luis Obispo

548
Quantitative Reasoning: Reflections on a New Alternative to College Algebra
Higher Education Session
An instructor and a graduate assistant teach an experimental course titled “Quantitative Reasoning” with a twist. Both manage to engage students and improve students’ views of mathematics, but in different ways. In this session, we will describe the course and our successes/challenges in teaching nontraditional mathematics.

Martha E. Watkins
University of Arkansas at Fayetteville
David DeVille
University of Arkansas at Fayetteville
2:00 P.M.–3:00 P.M.

549
Numeracy Club: Reflections from Elementary Education Preservice Teachers
Preservice and In-Service Session
The aim of this presentation is to describe how a cohort of preservice teachers altered their math anxiety levels after experiencing inquiry-based mathematics lessons and activities during their mathematics methods course and participating in fieldwork, which was in an after-school program called “Numeracy Club.”
Nataly Z. Chesky
State University of New York at New Paltz
Rabab Abi-Hanna
State University of New York at New Paltz

549.1  Empower Teachers, Engage Students, Make Math Fun: Intervention That Does It All
General Interest Exhibitor Workshop
Meeting the needs of students who struggle with mathematics can be a real challenge for classroom teachers. Come learn how to empower teachers through a friendly, engaging, and fun intervention model that provides effective strategies for rich instruction, blending both conceptual and procedural learning, which fosters students’ abilities to build mathematical connections.
Teacher Created Materials
Huntington Beach, California

549.2  Channel One News: Engaging Students through News and Current Events
Pre-K–6 Exhibitor Workshop
Channel One News is a Peabody and Telly award-winning program broadcast to nearly 5 million young people across the U.S. Our daily news show and wraparound educational materials are aligned to state standards and CCSS and designed to help students, teachers, and parents interpret the news and to spark important conversations.
Houghton Mifflin Harcourt
Boston, Massachusetts

549.3  Maximizing Technology in the Shift to Common Core
Pre-K–11 Exhibitor Workshop
Showcase of new instructional strategies that address student cognitive and social needs. The experience will include a full demo of the Pearson System of Courses, a full digital curriculum for ELA and Math. You have never seen instruction like this!
Pearson
Upper Saddle River, New Jersey

549.4  Math Upgrade Common Core Lessons Using Songs, Video, and Games
3–5 Exhibitor Workshop
Math Upgrade features musical, high-interest lessons covering all Common Core standards for grades 1 to 8. Find out how teachers transform their classes using interactive whole-class lessons and individual online courses. Learn how special needs and far below basic students can master the Common Core curriculum. Join us for math, music, and fun!
Learning Upgrade, LLC
San Diego, California

549.5  Redesigning Assessment Items for Greater Rigor
3–5 Exhibitor Workshop
One of the hallmarks of new-generation assessment items is a higher level of rigor. This session will examine the characteristics of high-rigor items. Participants will have a chance to do their own screening of items and learn how to augment the level of rigor in items they are currently using in their assessments. Targeted for grades 3 to 8.
Triumph Learning
New York, New York
2:00 P.M.–3:00 P.M.

549.6 Developing Strong K–2 Number Sense with Singapore Math Primary Mathematics
3–5 Exhibitor Workshop

Through the use of manipulatives and activities, this interactive workshop gives teachers practical understanding of concrete-pictorial-abstract (CPA) approach. Learn strategies for building strong number sense foundation, composing/decomposing numbers within 10 and regrouping within 20, and formative/summative assessments.

Singapore Math, Inc.
Tualatin, Oregon

552 No Nonsense Number Sense
Pre-K–2 Gallery Workshop

In this workshop, primary teachers will experience hands-on, standards-based activities that facilitate the development of number sense concepts for young students. Participants will engage in interactive activities that integrate operations and algebraic thinking, measurement, data, and geometry concepts while reinforcing number sense concepts.

Latrenda Knighten
East Baton Rouge Parish School System, Louisiana

GRAND BALLROOM E (WESTIN)

2:45 P.M.–4:00 P.M.

550 Build Productive Mathematical Thinkers
Pre-K–2 Gallery Workshop

We will explore new approaches to assist students in deepening their understanding of addition and subtraction equations/sentences. Activities include balancing equations with math puzzlers and other thought-provoking activities to build confident and competent young problem solvers.

Mary C. Cavanagh
Arizona State University, Tempe

553 What Is Number Sense and How Should We Teach It?
Pre-K–2 Gallery Workshop

Do you have students counting on their fingers to add? What those students lack is number sense. Number sense can’t be taught, it has to be experienced. So come experience activities involving a MathRack, number path, and subtilizing that will help develop your students’ number sense and their ability to add and subtract flexibly and fluently!

Lynn Rule
Retired Teacher, Wheaton, Illinois
Christina Tondevold
Mathematically Minded, LLC, Orofino, Idaho

256 (BCEC)

551 Moving Students Forward: Formative Assessment in K–2
Pre-K–2 Gallery Workshop

Formative assessment is a powerful tool for teachers to help build student understanding and confidence. Discuss appropriate probes around number sense, ideas for incorporating hands-on learning, and strategies for providing feedback to young learners while engaging in a variety of formative assessment tasks.

Sara Delano Moore
ETA hand2mind, Vernon Hills, Illinois

554 What! No Math Timed Test! What’s a Teacher to Do?
Pre-K–2 Gallery Workshop

It is a widespread belief that to be good at math means to be fast at computation. But this belief may do more harm than good. While computational recall is important, it is only part of a comprehensive mathematical understanding. This session will provide lots of hands-on activities for a K–2 teacher to use immediately in their classroom.

Jimmie A. Salinas
Cobb County School District, Marietta, Georgia

205 C (BCEC)
2:45 P.M.—4:00 P.M.

555  
**CCSS Mathematical Practices: Promoting Geometric Thinking with Manipulatives**  
3–5 Gallery Workshop
Creative and engaging hands-on activities for exploring geometric concepts will be presented. Participants will leave with materials and lesson ideas to aid in developing their students’ geometric thinking. Resources to help teachers integrate the geometry Common Core standards within their classrooms will be included.

*Beverly J. Ferrucci*  
Keene State College, New Hampshire

556  
**Number Talks: Developing Computational Fluency through Conceptual Understanding**  
3–5 Gallery Workshop
Number talks are a powerful tool fundamental in developing students computational fluencies with conceptual understanding. Thoughtfully crafted computation problems add rigor to any curriculum to support CCSSM. Number talks offer the opportunity to meet students where they are developmentally and to support the Standards for Mathematical Practice in the classroom.

*Kristin N. Gray*  
Cape Henlopen School District, Lewes, Delaware  
*Nancy L. Thornburg*  
Cape Henlopen School District, Lewes, Delaware

557  
**Questioning for Language Development, Discourse, and Deepening Math Content Knowledge**  
3–5 Gallery Workshop
The interactive session focuses on strategies for implementing questioning practices to promote meaningful student discourse in math. Classroom videos exhibit how students, particularly English language learners, acquire math content and language while engaging in rich math peer discussions. Five key strategies for contributing to classroom discourse are offered.

*Cathy Kinzer*  
New Mexico State University, Las Cruces  
*Mari Rincon*  
Las Cruces Public Schools, New Mexico  
*Ricardo Rincon*  
Las Cruces Public Schools, New Mexico

558  
**Repeating Patterns, Algebraic Reasoning, and the Standards for Mathematical Practice**  
Preservice and In-Service Gallery Workshop
Repeating patterns provide an engaging and authentic context for developing algebraic reasoning in a way wholly consistent with the Standards for Mathematical Practice in CCSSM. The tasks in this workshop address content related to multiples, arithmetic sequences, decimals, and algebraic notation, as well as all of the mathematical practices.

*Nirmala Nutakki*  
SUNY Buffalo State College, New York

559  
**Algebra Project and Young People’s Project: The Flagway Game**  
3–5 Gallery Workshop
We motivate third- through eighth-grade students to master the prime factorization of numbers from 1 to 150; numbers are assigned Red, Yellow, or Blue colors based on a physical representation of the Mobius function. Student teams compete in “Flag-Way” games, running three numbers through a tree graph with 27 color-coded paths.

*Robert P. Moses*  
The Algebra Project, Inc., Cambridge, Massachusetts
560
Employing Effective Questioning Strategies and Mathematical Discourse to Increase Achievement

3–5 Gallery Workshop

The speaker will engage attendees using effective questioning strategies applied to complex, real-world problems. She will model how to design instruction where every child’s instructional needs are addressed, thinking is visible, student feedback informs instruction, and standards-based learning results from thinking—not memorization. Handouts provided.

Donna L. Knoell
Educational Consultant, Shawnee Mission, Kansas

COMMONWEALTH A-B (WESTIN)

2:45 P.M.–4:00 P.M.

561
Partner Up Mathematical Writers! Exploring the Shared Writing Frame

3–5 Gallery Workshop

Come review the shared writing frame, a new tool designed to have individual students—with contributions from their partners—construct viable arguments, critique the reasoning of others, and attend to precision. Take part in using the shared writing frame, analyzing student work, and developing ways to integrate it into your own classroom.

Madelyn M. Williams
University of Connecticut, Storrs

252 A (BCEC)

562
Techy Tasks with a Side of Rigor

6–8 Gallery Workshop

Are you looking for a recipe to develop rigorous Common Core tasks to feed your students? If so, come to this session where participants will use iPad apps to build rigorous real-world tasks. This hands-on session will build and develop rigorous tasks for any classroom setting. Learn from teachers and math coaches who have been implementing these for the past four years.

Melissa G. Haun
Loudon County Schools, Tennessee
Patrick H. Bethel
Loudon County Schools, Tennessee

206 A/B (BCEC)

563
Equivalent Figures: Deriving Area Formulas by Composition and Decomposition

6–8 Gallery Workshop

Must area formulas be memorized and applied by rote? Boost your students’ engagement and understanding of area by inviting them to compose and decompose plane figures into equivalent or related figures. Learn to use these figures to derive area formulas for right triangles, other triangles, special quadrilaterals, regular polygons, and circles.

Emily R. Keebler
Montessori Children’s Community, Sewickley, Pennsylvania

GRAND BALLROOM C (WESTIN)

564
Ratios and Proportional Relationships

6–8 Gallery Workshop

This session will provide opportunities to weave the Common Core practice standards into the content standards, focusing on the Ratios and Proportional Relationships domain. In addition, participants will focus on integrating modeling and real-world problems into everyday lessons and tasks. Leave with some engaging hands-on tasks for your classroom.

Dana Cartier
Illinois State Board of Education, Springfield
Heather M. Brown
Illinois Center for School Improvement, Mundelein

102 A/B (BCEC)

565
Fractions: Everybody Knows Your Name?

3–5 Gallery Workshop

Does every student in a classroom really know and understand fractions? Participants will explore practice-rich tasks that integrate handheld technology, digital content, and manipulatives to build fraction concepts. Specific examples of the Standards for Mathematical Practice in action will show effective teaching of fractions for all learners!

Christine Ruda
Teachers Teaching with Technology, Florida Department of Education, Miami

104 A/B (BCEC)
2:45 P.M.–4:00 P.M.

566  
**Modeling Concepts across the Domains**  
6–8 Gallery Workshop  
Participants will engage in modeling various concepts in middle school mathematics from double number lines, tape diagrams, linear functions, box plots, and multiplication of binomials and binomials by trinomials using a variety of materials. Conjecture boards will be modeled as a means of assessing student misconceptions. Focus will be on Standards for Mathematical Practice 3 and 4.  
Anne M. Collins  
Lesley University, Cambridge, Massachusetts  
210 A (BCEC)

567  
**Common Core Based Investigations in Geometry**  
6–8 Gallery Workshop  
Participants will explore hands-on activities designed to investigate CCSSM and the mathematical practices related to geometry. See how these explorations and the use of handheld technology make the mathematical practices come alive in the classroom and engage your students in tasks rich in problem solving.  
Fred Decovsky  
Teachers Teaching with Technology, Millburn, New Jersey  
253 C (BCEC)

568  
**Algebra 1 Common Core: This Is How We Do It!**  
9–12 Gallery Workshop  
This session is student centered, hands-on, and filled with fun activities that are geared toward the Algebra 1 Common Core State Standards. Participants will leave with many free resources that can be readily implemented in the classroom.  
Michelle D. Jackson  
Little Rock School District, Arkansas  
Karen Rivers  
University of Arkansas at Little Rock  
204 A/B (BCEC)

569  
**Emphasizing Experimentation and Discovery in the Teaching of Geometry**  
9–12 Gallery Workshop  
A high school geometry course can offer students opportunities to develop reasoning skills, academic language, and proof writing techniques through the use of experimentation and generalization. This session will engage participants in exploring rich tasks which emphasize such ideas and allow students to enhance their understanding of geometry.  
Matthew Chedister  
University of Wisconsin–LaCrosse  
253 A (BCEC)

570  
**Financial Literacy for the High School Student**  
9–12 Gallery Workshop  
During this hands-on workshop, the presenter will present appropriate activities for teachers to implement in their algebra 1, geometry, algebra 2, or a personal finance class for grades 9–12. Content will be real-life application of Common Core standards. Activities will include group projects, software programs, and individualized life skills project.  
Lauren Ward  
Northeastern School District, Manchester, Pennsylvania  
156 C (BCEC)

571  
**Fun with Functions through Mathematical Discourse**  
9–12 Gallery Workshop  
Participants will experience study team and teaching strategies that showcase discourse, while working with the mathematical content of functions. Participants will be actively engaged in using these strategies and experiencing how to bring the Standards for Mathematical Practice to life in their secondary level classroom.  
Sharon Rendon  
CPM Educational Program/Rapid City Area Schools, South Dakota  
257 A/B (BCEC)
2:45 P.M.–4:00 P.M.

572
Prove It! . . . With Rigid Motion Transformations
9–12 Gallery Workshop
Participants will be presented with pairs of geometric figures. Through exploration, we will devise strategies for using one or more rigid motion transformations to prove, or disprove, congruency. Along the way, we will analyze the merits of paper folding, compass-straight edge, and handheld technology as we perform the various constructions.

John Ashurst
Harlan Independent Board of Education, Kentucky
Lindsay A. Gold
Ohio University, Athens

573 NT
Beyond the Common Core: Inspiring Students to Learn!
General Interest Session
Learn how to create a motivational classroom culture built on “embracing student errors” and providing meaningful feedback to students. In 2015, rigorous content and practice standards shift planning and action expectations for veteran and new teachers. Explore high-leverage teacher strategies that inspire students to learn daily on a unit-by-unit basis.

Mona Toncheff
NCSM Regional Director Western Region 1; Phoenix Union High School District, Phoenix, Arizona

574
Taking the Fear Out of Teaching Math for the Newcomer
Preservice and In-Service Session
Using my own experiences with thousands of preservice and novice teachers I will share easy, ready-to-implement teaching techniques and activities that help students feel more at ease learning math. My focus will be on making your class engaging and student centered. You will leave with a set of great web-based resources and classroom-ready activities.

Norma J. Boakes
Richard Stockton College of New Jersey, Galloway, New Jersey

3:30 P.M.–4:30 P.M.

575
10 To-Dos for Converting Principles to Actions into Tangible Improvements
General Interest Session
This fast-paced, example-laden presentation will look at ten specific actions that teachers and teacher leaders can take to translate the vision and recommendations of NCTM’s Principles to Actions into focused and impactful initiatives. We’ll focus on teaching and learning, tools and technology, assessment and professionalism.

Steven Leinwand
American Institutes for Research, Washington, D.C.

576
Mathematicians on the Common Core State Standards for Mathematics: A Panel Discussion
General Interest Session
In this panel, a group of university-level mathematicians will discuss the Common Core State Standards for Mathematics (CCSSM): What are the challenges in implementing it well, and what are the benefits of doing so? Specific topics include the relationship between practice and content standards and preparing students for calculus and for STEM fields. Panelists include Jennifer Beineke (Western New England University), Richard Bisk (Worcester State University), Steven Rosenberg (Boston University), and Yvonne Laid (University of Nebraska-Lincoln).

Solomon Friedberg
Boston College, Chestnut Hill, Massachusetts

577
An English Language Learning Instructional Framework for Mathematics That Works!
General Interest Session
Learn about an instructional framework, Achievement Inspired Mathematics for Scaffolding Student Success, that provides strategies to allow ELLs and all students to own the language of mathematics, access the knowledge, and be fluent in demonstrating that understanding. It also deepens teachers’ mathematical understanding and curricular knowledge.

Lisa M. Meyer
Dual Language Education of New Mexico, Albuquerque
3:30 P.M.–4:30 P.M.

578 EQ
CCSS Mathematical Practices: Getting Students to Use Them Realistically
9–12 Session
Research shows that children of African ancestry need teachers who can establish an affective relationship. Examples will be presented showing how reluctant teachers who are procedural-holics can move into using the mathematics practices through an invitation, appropriate questioning, and creating/selecting high-level cognitive demanding activities.

Kwame Anthony Scott
Benjamin Banneker-Djehuti Ma’athematics, LTD, Chicago, Illinois
211 (BCEC)

579
Effective Strategies for Planning and Teaching CCSS-Aligned Lessons
General Interest Session
Learn about specific teacher and student behaviors in CCSS-aligned lessons while examining NCTM’s Principles to Actions and the Instructional Practice Guide. We’ll address innovative teaching strategies that engage all learners and share free digital resources that support effective planning, coaching, and self-reflection.

Barbara Beske
Student Achievement Partners, New York, New York
Beth Cocuzza
Student Achievement Partners, New York, New York
205 B (BCEC)

580
Mathematical Secrets behind the Common Core State Standards
General Interest Session
Have you ever read a CCSS standard and wondered, “What was the thought behind that standard?” Hear the mathematical meanings behind some of the ratio, rate, and function standards, why they are important, and how those meanings can lead to effective teaching innovations that will help your students to see math as a coherent whole that makes sense.

Scott Baldridge
Louisiana State University; Lead Writer and Mathematician, Common Core, Inc., Baton Rouge
104 C (BCEC)

581 EQ
Storytelling a Social-Justice History of Mathematics
General Interest Session
Did you learn the history of math in childhood, and if so, whose history was presented? What if we taught children a multicultural, gender-balanced history of mathematics through oral storytelling? This session begins with an oral storytelling performance, followed by creative interaction as participants begin to craft their own oral math stories.

Kaci F. Elder
Illinois River Valley Arts Council (IRVAC)/TODOS: Mathematics for ALL, Cave Junction, Oregon
154 (BCEC)

582
Supporting Effective Mathematics Instruction in an Urban District
General Interest Session
Urban districts often experience a good deal of change as superintendents come and go, central offices undergo reorganization, and new priorities are identified. In this context of ongoing change, how might we successfully maintain a focus on strengthening mathematics teaching and learning in all our classrooms and for all our students?

Linda Ruiz Davenport is the Assistant Director of K–12 Mathematics Research and Development for the Boston Public Schools. Her work focuses on the identification of best practices that can support a district’s transition to the Common Core State Standards for Mathematics. Previously, she spent fourteen years as the Senior Program Director for Elementary Mathematics for the Boston Public Schools. Before that, Davenport was a middle school and high school mathematics teacher for the Austin Independent School District, a mathematics specialist for a Bilingual Education Service Center for the Northwest, an assistant professor of mathematics education at Portland State University, and a project director at the Center for Teaching and Learning at the Education Development Center in Newton, Massachusetts. She chaired the NCTM Emerging Issues Committee during the development of CCSSM and was recently an editor of the NCSM Journal of Mathematics Education Leadership and a member of the NCSM Board.

Linda Ruiz Davenport
Boston Public Schools, Massachusetts
BALLROOM WEST (BCEC)
3:30 P.M.–4:30 P.M.

583
Why Do So Many Elementary Students Have Trouble in Math?
General Interest Session
Math has traditionally been taught by getting children to use ready-made rules, such as that of “carrying.” I have done more than ten years of classroom research and have written books about what happens when children are encouraged to do their own thinking and invent their own procedures. They have been found to become confident and able to invent.

Constance Kamii
University of Alabama at Birmingham
GRAND BALLROOM B (WESTIN)

584
Powerful Routines to Develop Place Value Big Ideas in Kindergarten
Pre-K–2 Session
Understanding the structure of our place value system is critical for students’ mathematical development. This journey begins in kindergarten. In this session we will share powerful routines structured around key mathematical models. We will explore how routines can be strategically implemented to develop students’ reasoning in place value.

Antonia Marie Cameron
Metamorphosis Teaching Learning Communities, New York, New York
Danielle Iacoviello
Metamorphosis Teaching Learning Communities, New York, New York
Patricia Gallahue
New York City Department of Education, New York, New York

207 (BCEC)

585
+Framework x by Action ÷ by Coaches = Success!
3–5 Session
See how Ohio’s ninth-largest district transformed teachers’ dispositions and personalized mathematical instruction for students by creating a district instructional framework. Join us as we share our journey with action-based research to provide a personalized coaching model for fourteen elementary schools.

Cheryl Gehres
Hilliard City School District, Ohio
Jennifer Adams
Hilliard City School District, Ohio

160 A (BCEC)

586
Girls’ Attitudes toward Math: What Do They Really Think?
Pre-K–2 Session
What do girls think about math? Do they get nervous when solving math problems? Do they find math useful and work hard in math? This presentation will share the results of a study that examined elementary girls’ attitudes towards math. Strategies and activities to support girls’ confidence, motivation, and learning in math will also be shared.

Mercedes Tichenor
Stetson University, DeLand, Florida
Bette Heins
Stetson University, DeLand, Florida
Kathy Piechura
Stetson University, DeLand, Florida

260 (BCEC)

587
Transform Young “Problem Performers” into “Problem Solvers”!
Pre-K–2 Session
Primary-age children often rely on the “grab numbers and compute” problem-solving strategy, which fails to promote mathematical reasoning and understanding. We’ll discuss effective instructional strategies that help K–2 students make sense of problems and persevere in solving them. Come learn how to put the thinking back into problem solving!

Susie Katt
Lincoln Public Schools, Nebraska

159 (BCEC)

588
Fractions Are Just Numbers, Plain and Simple
3–5 Session
How do we achieve equity for all as we implement the new Common Core? This presentation will focus on strategies and resources for teaching fractions through grades 3–5 with particular emphasis on the Standards for Mathematical Practice. Participants will problem solve, watch students in action, and discuss which strategies put students first.

Michele Lippens
Cambridge Public Schools, Massachusetts
Ann Marie Varella
Cambridge Public Schools, Massachusetts

161 (BCEC)
3:30 P.M.–4:30 P.M.

589
Differentiation in a Standards-Based Curriculum: Meeting All Students’ Needs
3–5 Session
Finding ways to differentiate instruction when adopting a new curriculum can be a daunting task for teachers. This session will highlight how elementary in-service teachers differentiated instruction for a standards-based curriculum as a result of their participation in a professional learning community (PLC).
Carolyn Mitten
University of Florida, Gainesville
Tim Jacobbe
University of Florida, Gainesville

DOUGLASS (WESTIN)

590 PS
Open-Ended Problems with Purpose
3–5 Session
Even if we give interesting math problems to students, simply solving a problem should not be the focus of a lesson. The focus should be on the ideas that the problem unveils. We will explore a number of interesting open-ended problems by focusing on the underlying ideas they unveil to students.
Marian Small
University of New Brunswick, Fredericton, Canada

210 B (BCEC)

591
Accentuate the Positive: Exploring Math with Families
6–8 Session
Learn how a group of urban math teachers turn their school into a math playground for middle school students and their families. Witness their engaging strategies for hands-on math activities. Discover how to improve student growth by focusing on how students can improve their mathematical performance by playing with math.
Linda G. Singer
Springfield Public Schools, Massachusetts
Andrea Strom
Van Sickle Middle School, Springfield, Massachusetts
Annie M. Parker
University of Massachusetts Amherst

GRAND BALLROOM D (WESTIN)

592 EQ
Boosting Girls’ Confidence and Understanding in Algebra
6–8 Session
Avoid the middle school drop! Join us and learn how to engage girls in learning beginning algebra through three levels of sense making. Explore the transition from arithmetic to algebra and look at how to adjust tasks and content based on student learning and interest. Sample activities and lessons will be shared.
Heather Crawford-Ferre
University of Nevada, Reno
Diana L. Moss
Appalachian State University, Boone, North Carolina

258 A (BCEC)

593
Productive Struggle: Solving Problems One Step at a Time!
6–8 Session
Hiebert and Grouws (2007) use the term productive struggle to refer to the “effort to make sense of mathematics, to figure something out that is not immediately apparent.” This session will focus on ways to foster a productive struggle climate and tone in your classroom.
Ann McCoy
University of Central Missouri, Warrensburg
Kieshelle S. Cudjoe
School of Business, Finance, and Entrepreneurship, Brooklyn, New York

106 (BCEC)

594
Statistics in the Middle Grades Using the TI-Nspire iPad App
6–8 Session
CCSS has placed the majority of the statistical concepts in grades 6–8. The TI-Nspire App for the iPad is an ideal environment to help students summarize and analyze data using measures of central tendency and different graphical methods such as histograms, box plots, bar and pie charts, and more.
Dona McSpadden
Fayetteville Public Schools, Arkansas
Kara L. Leaman
Unity High School, Tolono, Illinois
Ann M. Schlemper
Columbia College, Columbia, Missouri

255 (BCEC)
3:30 P.M.–4:30 P.M.

595
Using Formative Assessment to “Dig Into” the Common Core
6–8 Session
Learn how to use the formative assessment process to dig into the middle grades proportional relationships learning progression. This session will demonstrate how to integrate lesson planning, high cognitive demand tasks, questioning, and effective feedback as part of the formative assessment process.
Edward C. Nolan
Montgomery County Public Schools, Rockville, Maryland

596
Middle School Mathematics Teacher Evaluation: Subject Specific Feedback
Research Session
Teacher evaluation has recently created a national stir. While many studies have examined evaluation protocols, few investigated subject-specific feedback. This session will share findings from a qualitative study that examined the nature of post-observation feedback to mathematics teachers from observers with varying mathematical backgrounds.
Christine P. Trinter
Virginia Commonwealth University, Richmond

597
(Problem Solving + Communication) X Critical Thinking = Mathematics Success for All!
General Interest Session
President’s Series presentation
Focus your teaching on the three main pillars of problem solving, communication, and critical thinking/ reasoning to help all students achieve success in mathematics. During this session, participants will unpack and discuss teaching strategies that build students’ tool kit enabling them to become mathematically literate citizens.
John Staley
President-Elect, National Council of Supervisors of Mathematics; Director of Mathematics, Baltimore County Public Schools, Maryland

598
Student-Driven Learning: Project and Problem-Based Geometry and Algebra I
9–12 Session
Remove lectures from your curriculum and put students in the driver’s seat of their learning. These practices can be integrated with or without technology! Come learn how to integrate methods we practice daily including design projects, mathematical modeling, self-written texts, and flipped classrooms.
Kathleen M. Argall
Norfolk Academy, Norfolk, Virginia

599
Crime Scenes in the Classroom
9–12 Session
This presentation describes a highly effective and engaging algebra 2 lesson on natural logarithmic functions using the context of forensic science. Students walk into a crime scene in which they must take temperature measurements on a dead body (potato), and use them to determine the time of death. Handouts, insights, and examples will be provided.
Janeen Bonner
Hinsdale Central High School, Illinois

600
QR Code Scavenger Hunt
9–12 Session
Who doesn’t love a scavenger hunt? We hide the QR Codes and have our students search for them. Each QR Code leads to a website with a question. Get it right and you get a clue to open our prize box. Come join us for some fun and actually take part in the scavenger hunt! Make sure you bring a pencil and paper and a device with a QR code reader.
Brian McBain
North Lambton Secondary School, Lambton Kent District School Board, Forest, Canada
Jennifer McBain
North Lambton Secondary School, Lambton Kent District School Board, Forest, Canada
Heather Curl
Lambton Kent District School Board, Chatham, Canada
3:30 P.M.–4:30 P.M.

601  Using Geometer’s Sketchpad to Dissect the Geometry of Washington, D.C.
9–12 Session

This session will explore the mathematical beauty of the streets of our Nation’s Capital. Participants will learn how to engage their students with the mathematics that shows up right along the streets and historical landmarks of the city and discover how the use of technology can enhance the application of math concepts.

Theresa J. Simmons
Friendship Collegiate Academy, Washington, D.C.

602  What Do My Students Know? How Do They Know It?
9–12 Session

Knowing what students know and how they know supports instruction for struggling students in algebra. Progress monitoring tools that gather conceptual and procedural data with three measures of each type will be used in this presentation. The presenters will share lessons learned from students and teachers from schools in three different states.

Barbara J. Dougherty
University of Missouri, Columbia
Jeannette Olson
Iowa State University, Ames

603  LinReg Exposed!
9–12 Session

Here’s an engaging, enriching explanation of the algebra behind the linear regression feature of many graphing calculators. With the help of CAS (computer algebra system) it’s easy to grasp this elegant algorithm and the basic algebra that makes it effective and understandable.

John Hanna
Teachers Teaching with Technology, Dallas, Texas

604  Building Mathematical Thinkers through Inquiry and Assessment
Preservice and In-Service Session

Well-developed, unconventional, and open-ended mathematical investigations can lead to deep mathematical thinking and act as powerful assessment tools, immediately revealing student understanding, gaps, and misunderstandings. We will investigate the nature of these investigations, develop our own examples, and take some examples home.

Michael J. Bosse
Appalachian State University, Boone, North Carolina
Kayla Chandler
North Carolina State University, Raleigh

604.1  A Balancing Act: Providing Grade-Level and Foundational Skills Practice
General Interest Exhibitor Workshop

Do you struggle with providing effective math practice for grade-level standards and foundational skill development? The new Accelerated Math 2.0 and STAR Math help you find this balance in your classroom! Learn how teachers get the help they need to advance students from Kindergarten through high school and better prepare them for college and career.

Renaissance Learning
Wisconsin Rapids, Wisconsin

604.2  Understanding the Most Challenging Common Core Math Standards
General Interest Exhibitor Workshop

What if you could pinpoint exactly which of the new, rigorous standards students struggle with most? Drawing from data from 750,000+ students, this session does just that! Join Mathematics professor Dr. Mark Ellis as he presents the most challenging standards and shares instructional tools and strategies to help all learners master them.

Curriculum Associates
North Billerica, Massachusetts
3:30 P.M.–4:30 P.M.

**604.3 CW**
Using HMH Math Programs for Blended/Hybrid Learning in an LMS
Pre-K–12 Exhibitor Workshop
This session will discuss key blended/hybrid learning practices and how you can easily implement them with HMH Math Programs in Common Cartridge. This session will include examples of the HMH tools, services, and strategies that have been used successfully in 1:1 districts.
Houghton Mifflin Harcourt
Boston, Massachusetts

**604.4 CW**
To Infinity and Beyond! Boost Your ELL Learners Academic Vocabulary
3–5 Exhibitor Workshop
The need for ELL learners to develop their mathematics vocabulary is essential for their mastery and achievement of key concepts. In this session we will share strategies, activities, games, and professional resources that will boost and empower your learners to speak the language of mathematics!
Teacher Created Materials
Huntington Beach, California

**604.5 CW**
Math Navigator: Targeted, Flexible, and Precise Intervention
3–8 Exhibitor Workshop
Why do some students struggle with basic math concepts? Pearson’s Math Navigator intervention program targets misconceptions that prevent students from mastering the foundational concepts which result in poor performance. Multiple representational activities guide students to correct their misconceptions. Learn how the Math Navigator Screener quickly diagnoses specific weaknesses and makes recommendations among the 26 skills modules.
Pearson
Upper Saddle River, New Jersey

Make time to explore the Exhibit Hall for the latest educational resources!
Look for us at the 2015 NCTM Annual Meeting & Exposition

April 15-18th, Boston, MA

NCTM-sponsored insurance plans have been carefully chosen for their valuable benefits at competitive group rates from a variety of reputable, highly-rated carriers.

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Go Figure!
*Number Sense Routines That Build Mathematical Understanding*

Jessica Shumway
See number sense routines in action as Jessica Shumway, author of *Number Sense Routines*, and three other teachers engage students in these quick yet numerically rich experiences that help build a strong foundation for understanding mathematics. Watch how these teachers make in-the-moment decisions about where to take a mathematical conversation and reflect on their instructional planning and students' learning.

*Grades K–5 | 100 minutes | 4Z-0984 | $150.00 DVD
STREAMING AVAILABLE*

Common Core Sense
*Tapping the Power of the Mathematical Practices*

Christine Moynihan
The Standards for Mathematical Practice provide an excellent foundation for encouraging students to think, reason, and persevere like mathematicians, yet many elementary school teachers struggle with unpacking the practices and figuring out how to implement them in their classrooms. In *Common Core Sense*, Christine Moynihan makes the practices more explicit and accessible and shows what each practice might look, sound, and feel like in the classroom using the GOLD framework — G, go for the goals; O, open your eyes and observe; L, listen; and D, decide.

*Grades K–5 | 4Z-1004 | $19.00 Pb*

Making Number Talks Matter
*Developing Mathematical Practices and Deepening Understanding, Grades 4–10*

Cathy Humphreys and Ruth Parker; Foreword by Jo Boaler
Making Number Talks Matter is about the myriad decisions facing teachers as they make this fifteen-minute daily routine a vibrant and vital part of their mathematics instruction. Cathy Humphreys and Ruth Parker offer practical ideas for using Number Talks — questions to pose during Number Talks, teacher moves that turn thinking over to students, the mathematics behind the strategies, and ways to overcome bumps in the road — to help students learn to reason numerically and build a solid foundation for the study of mathematics.

*Grades 4–10 | 4Z-0998 | $23.00 Pb*

Intentional Talk
*How to Structure and Lead Productive Mathematical Discussions*

Elham Kazemi and Allison Hintz; Foreword by Megan Franke
Not all mathematics discussions are alike. According to Elham Kazemi and Allison Hintz, the critical first step is to identify a discussion’s goal and then understand how to structure and facilitate the conversation to meet that goal. Through detailed vignettes from both primary and upper elementary classrooms, the authors provide a window into what teachers are thinking and examine students’ roles as both listeners and talkers. Planning templates help teachers apply the right structure to discussions in their own classrooms.

*Grades K–5 | 978-1-57110-976-7 | $20.00 Pb*
Highlights
Closing Session: Math, the Language of a Creative Genius (Presentation 733)

Icon | Presentation Numbers
--- | ---
CC | Assessing The Common Core 610
EQ | Equity 611, 617, 641, 653, 654, 681, 708
EW | Exhibitor Workshops 629.1, 629.2, 672.1, 672.2, 672.3, 672.4, 672.5, 672.6
IM | Integrating Math with Other Disciplines 608
PS | Problems Worth Solving 627, 652, 712
SL | Supporting Students as Learners 614
TL | Supporting Teachers as Learners 618

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Registration Hours
7:00 a.m.–10:00 a.m.

Exhibit Hours
8:00 a.m.–Noon

NCTM Central/Bookstore 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.
8:00 A.M.–9:00 A.M.

**607**
**Taking a Stand: Detracking Math Classrooms**

General Interest Session

Most secondary schools separate students into different math classes based on perceived ability, resulting in tracks with unequal learning. Hear how San Francisco detracked math courses through tenth grade and implemented a core sequence for all students and PD structures to support teaching heterogeneous classes and to re-culture math departments.

Angela Torres
San Francisco Unified School District, California
Ho Nguyen
San Francisco Unified School District, California

**254 A/B (BCEC)**

**608**
**The M in STEM: Creating Bridges between Mathematics and Design**

General Interest Session

Very often math teachers struggle to find great problems with appropriate applications and science teachers struggle to find great problems that involve significant math principles. Our “The Mathematics of . . .” courses bridge that gap with coursework that improves content knowledge in a truly integrated math/science K–12 classroom. Come and see!

Steve Yurek
Lesley University, Cambridge, Massachusetts
Bill Barowy
Lesley University, Cambridge, Massachusetts
Mike Thibodeau
Lesley University, Cambridge, Massachusetts

**205 B (BCEC)**

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**609**
**Number Sense = Success!**

Pre-K–2 Session

K–2 teachers have the monumental responsibility of providing tasks and instruction to develop number sense in their very young students. Participants will glimpse inside K–2 classrooms and observe formative assessment tasks being used to develop number sense and mathematical reasoning throughout a school year. K–2 task packets will be provided.

Loria A. Allen
Alabama Math, Science, and Technology Initiative, University of Alabama in Huntsville

**255 (BCEC)**

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**610**
**PARCC K–1 Formative Tasks: A Look at Four Prototypes**

Pre-K–2 Session

Reflective, reliable observation of students helps guide teaching. Well-designed formative tasks makes life easier for teachers by supporting that observation. We will show how the PARCC K–1 formative tasks, available for download on the PARCC website, can be implemented in a classroom and how they support instruction for kindergarten and grade 1.

Doug Sovde
PARCC, Inc., Washington, D.C.
Matt McLeod
Education Development Center (EDC), Chicago, Illinois

**BALLROOM WEST (BCEC)**

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**611**
**Hour of Code: Inspiring Students to Learn Math through Technology**

Pre-K–2 Session

Come see how an urban district is using computer programming and technology to help African American and Latino students gain fluency in number, while embracing the habits of mind exemplified in the practice standards of the Common Core.

Karl Henry Romain
Little Rock School District, Arkansas
Elizabeth Clifford
Little Rock School District, Arkansas

**103 (BCEC)**

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Visit the NCTM Bookstore and save 25% off the list price of all publications and specialty items!
8:00 A.M.–9:00 A.M.

612 Engaging Activities + Effective Instructional Strategies = Numerically Nimble Students
3–5 Session
Discover ways to efficiently implement CCSSM, particularly the Standards for Mathematical Practice. These engaging activities and strategies promote greater sense making, as all students increase their numeric fluency and proficiency. Selected activities differentiate instruction, infuse algebraic thinking, and enhance students’ reasoning abilities.

Leigh Childs
San Diego County Office of Education, San Diego, California

613 Maximizing Your Mathematics Meeting
3–5 Session
Number routines are a common and valuable practice in the primary grades, but what about the elementary and middle grades? Join us as we discuss how to initiate a daily “Math Meeting” in your third- to fifth-grade classroom. You can set the stage for critical discussions and concept application in your classroom with just a few minutes each day.

Becky Smith Nance
Center for Mathematics and Science Education, University of Mississippi, Oxford, Mississippi

614 SL Formative Assessment Strategies That Support the Standards for Mathematical Practice
3–5 Session
This hands-on and interactive session uses Dylan William’s framework to focus on three key formative assessment strategies that support the CCSS Standards for Mathematical Practice: (1) discussion, activities, and tasks that elicit evidence of learning; (2) feedback that moves learning forward; & (3) activating learners as resources for one another.

Robert Q. Berry
University of Virginia, Charlottesville, Virginia

615 Planning for Success: Implementing Complex Tasks Accessible to All Learners
6–8 Session
While sharing a collection of complex tasks that support the CCSSM Standards for Mathematical Practice, we identify specific planning and teaching practices that enhance teachers’ capacity for engaging students of all abilities.

Jocelyn Van Vliet
Amplify, Durham, North Carolina
Luke T. Reinke
Amplify, Durham, North Carolina

616 Roadmap to RtI in Middle School Mathematics
6–8 Session
RtI has been less developed and has received less attention in mathematics, compared to literacy and behavior. The RtI Roadmap approach clearly defines tiers of support and the structures of RtI so that schools can provide the supports and strategies on key content to middle school students need to succeed in algebra and beyond.

Chris Weber
The Leadership and Learning Center, Englewood, Colorado
Thomas Hierck
The Leadership and Learning Center, Englewood, USA

617 EQ Supporting Student Learning Using an Integrated Mathematics and Engineering Curriculum
6–8 Session
This session focuses on the experiences of a Latina middle school student who co-facilitated the teaching of a curriculum that integrated mathematics and computer engineering in an out-of-school context. Video clips and activities will be used to explore teaching practices and curricular tasks that best support student learning.

Sylvia Celedón-Pattichis
University of New Mexico/TODOS: Mathematics for All, Albuquerque, New Mexico
Rebecca Pattichis
Albuquerque Institute of Mathematics and Science, Albuquerque, New Mexico
Carlos López Leiva
University of New Mexico, Albuquerque
8:00 A.M.–9:00 A.M.

618 TL
Supporting the Development of Effective Teaching Practices
Preservice and In-Service Session
This session will focus specifically on one of the eight effective teaching practices identified in Principles to Actions (NCTM, 2014)—facilitating meaningful mathematical discourse—and provide suggestions on how to help teachers develop the capacity to engage students in productive discussions.
Margaret Smith
University of Pittsburgh, Pennsylvania

619
Encryption for Those Who Don’t Know Shift
9–12 Session
Encryption is more than just a way to send and receive secret messages. It is a practical application of topics such as functions and their inverses, modular arithmetic, prime numbers, algebra, history, and more. Attendees will learn specific encryption and coding schemes for use in their classrooms as well as their fascinating historical context.
Martin Funk
New Trier High School, Winnetka, Illinois
Kyle Ogrodnik
New Trier High School, Winnetka, Illinois

620
Numbers and Beyond: Visually Linking Number Sense to Algebraic Thinking
6–8 Session
Transitioning to a role supporting elementary teachers provided me one of my most powerful learning experiences. Sense making of numbers, especially visually, not only gave me a deeper understanding of number, but also of algebraic thinking. Come explore the powerful conceptual links between number and algebra, both with technology and without.
Marc Garneau
Education Services, Surrey School District, Surrey, Canada

621
Replacing Confusions with Coherence in Teaching Geometric Transformations
9–12 Session
Of all the high school Common Core standards, the eleven standards relating to geometric transformations may represent the content most unfamiliar to mathematics teachers and writers of instructional materials. As a result, confusions are common. The speaker will discuss these confusions and provide suggestions as to how to overcome them.
Zalman Usiskin
University of Chicago, Illinois

622
The Shift from Arithmetic to Algebra: It Begins with Variables!
6–8 Session
Join us and learn how to engage students in learning beginning algebra! You will learn how to support students to transition from arithmetic to algebra by using real-world tasks. Explore how to support students to deepen their understanding of expressions and equations by attending to the changing concept of variables.
Diana L. Moss
Appalachian State University, Boone, North Carolina
Teruni Lamberg
University of Nevada, Reno

Don’t miss the Closing Session on Saturday afternoon with featured speaker and Discovery Channel producer Dr. Mike North!
8:00 A.M.–9:00 A.M.

623
Transformational Geometry with Technology: Implications of Common Core
9–12 Session
Transformations have increased emphasis in the Common Core. No longer are transformations relegated to middle school and touched on briefly in high school. This session will explore the connections to transformations throughout middle and high school and demonstrate methods for using technology to support student learning of transformations.

Janet B. Andreasen
University of Central Florida, Orlando
Erhan Selcuk Haciomeroglu
University of Central Florida, Orlando
Edward M. Knote
University of Central Florida, Orlando

624
Experience-First Mathematics: Implementing Problem-Based Learning Effectively
9–12 Session
Teachers can use a variety of techniques for bringing experience-first mathematics (EFM) into the classroom: problem-based learning, three-act lessons, NSF curricula, Moore Method, etc. Transitioning to using more inquiry can be done gently but effectively for students and faculty. For students to become true mathematical thinkers, EFM is essential.

Christopher J. Robinson
The Blake School, Minneapolis, Minnesota
Andre Verner
Lexington High School, Massachusetts
Ryan Mahoney
The Blake School, Minneapolis, Minnesota

625
Fridays, My Days 4 Great Math Tasks
9–12 Session
In the age of CCSSM we are challenged to get students involved in high-interest problem solving, and explorations. We will share several high school problems that challenge students to engage in mathematics and create models. Strategies for fitting high-interest topics into the curriculum will be discussed. Explore tipis, tornadoes, and transformations.

Richard T. Seitz
Helena High School, Montana

626
Scored Math Discussions: Assessing Discourse in the High School Classroom
9–12 Session
Scored discussions provide a method to model, measure, and improve the math discourse in the classroom. Adopting a structure successfully used in English and history classrooms, scored discussions measure students’ ability to productively participate in the problem-solving process. Participants will practice scoring, and leave with templates to use.

William Stafford
E.L. Haynes Public Charter School, Washington, D.C.

627
Fitting Functions to Tables
9–12 Session
Problem: find a function that agrees with a table of data. In this interactive session, we will look at classical methods that reveal connections among algebra, combinatorics, and arithmetic. Useful across a range of high school topics, the methods feature special appearances by some favorite mathematicians: Newton, Pascal, Lagrange, and Mahler.

Al Cuoco
Education Development Center, Inc., Waltham, Massachusetts
Sarah E. Sword
Education Development Center, Inc., Waltham, Massachusetts
8:00 A.M.–9:00 A.M.

**628**

Supporting Teachers’ Use of Discourse, Dynamic Geometry, and Collaboration Virtually

Preservice and In-Service Session

We describe a program where secondary teachers develop further their geometrical and dynamic-geometry knowledge for teaching. We explore how teachers further their knowledge through discursive interactions using specifically designed, researched dynamic-geometry tasks in an online, collaborative environment—Virtual Math Teams with GeoGebra (VMTwG).

Muteb M. Alqahtani  
Rutgers University, New Brunswick, New Jersey  
Arthur B. Powell  
Rutgers University, Newark, New Jersey

**629**

Teacher Content Knowledge Underpins Common Core Success: The Massachusetts Story

General Interest Session

Common Core demands from both students and teachers a far greater understanding of math. The key to successful implementation is raising K–8 teachers’ math content knowledge. Massachusetts is leading the way with expanded college courses, new certification standards, and an elementary math licensure test.

Tom Fortmann  
Massachusetts Mathematics Institute, Lexington, Massachusetts  
Richard Bisk  
Worcester State University, Worcester, Massachusetts  
Andrew S.C. Chen  
EduTron, Winchester, Massachusetts

8:00 A.M.–9:15 A.M.

**629.1**

Developing Computational Fluency: A Math Recovery® Approach to Teaching Number

Exhibitor Workshop

We will be sharing short video clips of children solving addition and subtraction tasks. The video clips will be used to facilitate conversation about the child’s strategy, as well as the learning tools and teacher moves used to support the child’s thinking. Participants will be engaged in partner conversation as well as conversation with the presenter.

US Math Recovery Council  
Apple Valley, Minnesota

**629.2**

Making Ideas Accessible with Virtual Manipulatives

Exhibitor Workshop

Learn how virtual manipulatives, combined with some simple teaching strategies, can be used to accessibly present elementary math ideas.

Matific  
New York, New York

8:00 A.M.–9:15 A.M.

**630**

Beyond Literature Connections: Storytelling in Math

Pre-K–2 Gallery Workshop

There is a plethora of children’s books that address all areas of the curriculum with engaging stories and whimsical illustrations, along with accompanying lesson plans. Math in literature has exploded! How about literature in math? What if our students approached math in a way similar to literature? What if they became the authors?

Teresita Cuesta  
Sidwell Friends School, Washington, D.C.
8:00 A.M.–9:15 A.M.

632  
There Is More to Math Than Facts . . . Like Problem Solving  
Pre-K–2 Gallery Workshop  
In this session, attendees will discover how LEGO bricks can help students bridge the gap between learning core math and applying it in real-life scenarios. Experience a solution designed to develop students’ problem-solving abilities while enhancing their vocabulary, reading, thinking, listening, and speaking skills related to mathematics topics.  
Kelly Reddin  
LEGO Education, Pittsburg, Kansas  
160 B/C (BCEC)

633  
Early Misconceptions in OA . . . Now What?  
Pre-K–2 Gallery Workshop  
As students develop their understanding in early Operations and Algebraic Thinking (OA), misconceptions form. How? Why? And what can we do to support students as learners? Together we will analyze common misconceptions and collaborate as we look at how students think, struggle, and reason. Mistakes and confusion are powerful learning opportunities.  
David Janssen  
Southern Nevada Regional Professional Development Program, Las Vegas, Nevada  
Bethany Farmer  
Somerset Academy, Las Vegas, Nevada  
156 C (BCEC)

634  
RtI and Mathematics: Helping Struggling Learners to Be Successful  
3–5 Gallery Workshop  
Come experience RtI in Mathematics and help your struggling learners to make sense of their mathematical world. High-quality instruction using evidence-based instructional/intervention methods and practices, hands-on activities, resources, representations, and strategies will be offered to help your students be mathematically successful.  
Gina Gresham  
University of Central Florida, Orlando  
157 B/C (BCEC)

635  
Partitioning: The Missing Link in Developing Conceptual Understanding of Fractions  
3–5 Gallery Workshop  
Too many of our students lack conceptual understanding of fractions even after studying them for several years! Before they can understand fractions, they must understand partitioning. We will explore contextual problems that develop and build on children’s understanding of partitioning, fair shares, and the meaning of fractions!  
Melisa Jean Hancock  
Manhattan Kansas School District  
258 B (BCEC)

636  
Why Can’t We Just Teach the Standard Algorithm?  
3–5 Gallery Workshop  
Through hands-on exploration and discussion, we will identify the challenges, strategies, and rewards of teaching multiplication by delaying the standard algorithm. Attendees will explore a variety of instructional tools that develop multiplication concept mastery in grades 3 and 4 and provide for a smooth transition to the algorithm in grade 5.  
Alison A. Wells  
Northbridge Public Schools, Whitinsville, Massachusetts  
Robin D. Agurkis  
Northbridge Public Schools, Whitinsville, Massachusetts  
206 A/B (BCEC)

636.1  
Ten-Frames . . . Making Sense of Decimal Fractions  
3–5 Gallery Workshop  
What are ten-frames? How do they work? Developing number sense and using the ten-frame tool help students to visualize decimal quantities and their values. Attend this session and experience firsthand how students would learn to use the ten-frame tool to extend their number sense from whole number understanding to decimal numbers.  
Selina Millar  
SD 36 Surrey School District, Surrey, Canada  
210 A (BCEC)
637
Digging into Fraction Division
3–5 Gallery Workshop
Dig into fraction division and discover why we invert and multiply, why we can divide fractions without doing so, how to represent fraction division pictorially, and how to help students divide fractions with understanding. We will address the different types of division, and we will create contexts that help all students to make sense of fraction division.
Julie McNamara
University of Michigan, Ann Arbor

638
Array We Go! To Understanding Multiplication, Division, and the Common Core
3–5 Gallery Workshop
Attendees will create hands-on models of arrays to demonstrate multiplication and division of whole numbers as well as decimal fractions. The activity will reflect Common Core shifts of focus, coherence, and rigor. The array represents a spatial model that demonstrates place value, partial products, algebraic thinking, and the distributive property.
John F. McAdam
Marist College, Poughkeepsie, New York
Carol R. Rinke
Marist College, Poughkeepsie, New York
Kelley Gould
Marist College, Poughkeepsie, New York

639
Fostering Mathematical Practices in Students with Learning Disabilities
6–8 Gallery Workshop
The CCSS Standards for Mathematical Practice articulate mathematical thinking and reasoning that is challenging for all students, particularly for students with learning disabilities. This session addresses challenges and opportunities inherent in the SMPs, and models a robust instructional routine that fosters the math practices in all students.
Amy Lucenta
Boston Teacher Residency, Boston, Massachusetts

640
Using and Creating Mathematical Stories to Foster Geometrical Development
Preservice and In-Service Gallery Workshop
During this session we will share mathematical stories that preservice teachers have written and engage in developmentally appropriate geometry activities that are aligned with the stories. These stories and activities provide ways of assessing students’ Van Hiele level of geometric thinking as well as pushing their thinking to the next level.
Angel Rowe Abney
Georgia College, Milledgeville, Georgia
Doris Santarone
Georgia College, Milledgeville, Georgia

641
Using Technology to Enhance ELLs’ Conceptual Understanding of Proportional Reasoning
6–8 Gallery Workshop
TODOS Mathematics for ALL collaborated with Texas Instruments to adapt lessons to include English language development strategies and technology. These lessons provide access to high cognitive demand tasks in proportional reasoning to ELLs in middle school. This session will highlight one of six lessons integrating language, math, and technology.
Bob McDonald
TODOS Mathematics for ALL, Tempe, Arizona
Mike Lutz
California State University, Bakersfield, Bakersfield, California
José Franco
West Ed, Oakland, California
8:00 A.M.–9:15 A.M.

642
Discourse Says It All . . .
9–12 Gallery Workshop
In this workshop, participants will engage in solving mathematics problems, comparing and contrasting problem designs that encourage productive mathematical discussions. Actions that teachers can use to create an environment for discussion as well as how to turn everyday activities into more discourse rich activities will be demonstrated.

Cara M. Goldberg
Boston University, Lexington, Massachusetts

253 C (BCEC)

643
Engineering a Number Line—A Unit for All Ages
6–8 Gallery Workshop
The 2013 runnerup Rosenthal Prize project uses constructions as an entrée to such beauty as number sets, cardinality, and geometry. Participants complete the project with guidance as needed, discuss typical student challenges, and possible extensions. This can be either an introductory unit or a capstone project, depending on the need.

Brent Ferguson
The Lawrenceville School, Lawrenceville, New Jersey

162 A/B (BCEC)

644
Learn about the Standards for Mathematical Practice Using Student Dialogues
6–8 Gallery Workshop
Explore the Standards for Mathematical Practice using student dialogues that show the practices in action. See how mathematical practices and content are intertwined in student thinking. You will (1) explore a mathematics task and share strategies, (2) read a student dialogue, and (3) discuss evidence of mathematical practices in that dialogue.

Johannah Nikula
Education Development Center, Waltham, Massachusetts
Victor Mateas
Education Development Center, Waltham, Massachusetts
June Mark
Education Development Center, Waltham, Massachusetts

205 A (BCEC)

645
Putting Self-Confidence, Enthusiasm, Excitement, and Endurance Back in Math!
9–12 Gallery Workshop
President’s Series presentation
Students are often forced to develop negative disposition toward mathematics by enduring traditional, non-engaging instruction. This session will describe activities and strategies used to motivate and inspire students to learn mathematics. Participants will experience activities that reach multiple dimensions of motivation.

Vanessa E. Cleaver
President, Benjamin Banneker Association, Little Rock, Arkansas
Marcelline Carr
Little Rock School District, Little Rock, Arkansas

257 A/B (BCEC)

646
Wicked Cool Algebra Tools: Making Sense of Patterns and Functions
6–8 Gallery Workshop
Using design principles articulated by Realistic Mathematics Education, participants will learn about and use various visual models that promote algebraic reasoning with patterns, generalization, and functions. We will also examine the connections between these models to explore ways to support students’ reasoning, insight, and skill.

David C. Webb
University of Colorado Boulder, Boulder, Colorado

253 A (BCEC)

647
Build the Algebraic Foundation for Confident Problem Solvers
9–12 Gallery Workshop
Build the Common Core algebraic foundation for confident problem solvers today. Approach the Common Core in a commonsense type of way while integrating the eight Standards for Mathematical Practice. Participate in teacher-created and teacher-led lessons that are currently being used in the classroom and that can be implemented in your classroom now!

Al Rabanera
Fullerton Joint Union High School District, Fullerton, California
Armandina Turner
Fullerton Joint Union High School District, Fullerton, California

256 (BCEC)
8:00 A.M.–9:15 A.M.

**648**

**Factoring Is NOT a Dirty Word (When It Makes Sense)**

9–12 Gallery Workshop

Engage in hands-on factoring activities using algebra tiles, an area model, the X-Box, AC, and Slip-Slide Methods, and a functional approach using graphing calculators. Improve your understanding of different methods and make connections between them and the roots of related quadratic functions using a new transformational approach to factoring.

*Jeffrey J. Steckroth*

Christopher Newport University, Newport News, Virginia

107 B/C (BCEC)

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**649**

**How to Connect Geometric Properties of Conics and Their Equations**

9–12 Gallery Workshop

Participants will fold models of parabolas, ellipses, and hyperbolas and then mimic the same actions using the Nspire app on the iPad. We will make the connection between geometry and algebra—between constructions and graphing—incorporating the power of patty paper, the iPad and the Nspire app.

*Arthur T. Mabbott*

Scholars On Line, Bellevue, Washington

102 A/B (BCEC)

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**650**

**Using Physics Labs to Support Modeling in Math**

9–12 Gallery Workshop

Science teachers use labs to develop and reinforce concepts all the time, but many of these labs can do the same for our math students. Using simple physics labs involving data collection and analysis, students can model many of the concepts and skills we expect them to master. Join us as we explore the connections together.

*Frank Noschese*

John Jay High School, Cross River, New York

*Anna Blinstein*

The Nueva School, San Mateo, California

*Matthew Owen*

Lusher Charter School, New Orleans, Louisiana

156 A/B (BCEC)

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**651**

**Martin Gardner and the Mathematical Practices**

9–12 Gallery Workshop

Come join us in celebrating the 100th anniversary of Martin Gardner’s birth. Gardner introduced us to polyominoes, Escher tessellations, geometric dissections, reptiles, and much more. See how these topics can be used to support the mathematical practices and teach transformations in novel ways.

*Michael Serra*

Self-Employed Consultant, San Francisco, California

210 C (BCEC)

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9:30 A.M.–10:30 A.M.

**652**

**Bringing the Standards for Mathematical Practice to Life In Classrooms**

General Interest Session

Experience, firsthand, specific teacher moves that will help bring the Standards for Mathematical Practice to life in the classroom. Whether you are a teacher working to align your mathematics classroom with the practice standards, or someone who works with teachers, this session is for you.

*Ruth E. Parker*

Mathematics Education Collaborative (MEC), Ferndale, Washington

205 B (BCEC)

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**653**

**Equity at the 13th International Congress on Mathematical Education 2016**

General Interest Session

A forum for discussion of gender equity issues that should be a priority for the ICME 13 conference in Hamburg, Germany, in 2016. The speaker is co-chair of the Topic Study Group: Equity in Mathematics Education (Including Gender) and is interested in participants’ views of critical issues that should be addressed relative to gender equity.

*Joanne Rossi Becker*

San José State University, San José, California

153 C (BCEC)
9:30 A.M.—10:30 A.M.

654 EQ

**Equity in Ethnomathematics: Connecting Research, Pedagogy, and Promising Practices**

General Interest Session

This presentation highlights a coordinated effort of promising practices, teacher strategies, and student work connected to the Hokule'a Worldwide Voyage (traditional, wayfinding Pacific Island canoe). We aim to deepen equity-based, mathematical applications for educators and leaders working in college, career, and community readiness contexts.

Linda Furuto  
University of Hawaii at Manoa, Honolulu  
Joseph Zilliox  
University of Hawaii at Manoa, Honolulu

253 B (BCEC)

655

**Five Essential Instructional Shifts for Transforming K–12 Common Core Classrooms**

General Interest Session

Explore five essential K–12 instructional shifts that emphasize the mathematical practices and the content they support. Engage with elementary, middle, and high school tasks and how to support them during instruction. Enhance your understanding of the shifts through the use of authentic video in elementary, middle, and high school classrooms.

Juli K. Dixon  
University of Central Florida, Orlando

BALLROOM WEST (BCEC)

656

**Teaching with Technology: Tips for Success**

General Interest Session

President’s Series presentation

The art of teaching has changed drastically over the past twenty years with use of the Internet and new technology. Visualization of mathematical ideas that may occur online can far surpass what may be created on the blackboard of a traditional class. Come learn some tips for success by a veteran online instructor.

Nancy J. Sattler  
Terra Community College and AMATYC President, Fremont, Ohio

210 B (BCEC)

657

**The Future of Homework, Knowing Student Results before Class Begins**

General Interest Session

What would you do if you had access to homework results before students arrive to class? How would the behavior of your students change if they received immediate feedback as they worked on their homework? Researchers in the Learning Sciences and Technology program at WPI know and they can show you how to make this a reality in your classroom.

Cristina Heffernan  
Worcester Polytechnic Institute, Worcester, Massachusetts  
Barbara Delaney  
Bellingham Memorial Middle School, Bellingham, Massachusetts

254 A/B (BCEC)

The NCTM Member Services, located inside NCTM Central in the Exhibit Hall, has activities, lessons, sample journals, and more—Stop by!
9:30 A.M.–10:30 A.M.

657.1 Digital Learning Environments for Standards-Based Curricula

General Interest Session

These two presenters report on what they have learned about digital opportunities and hazards from developing courses and materials for digitally rich classrooms from their involvement in developing courses for 1:1 classrooms. Topics will range from how problems and tasks are constructed, the role of tools and interactive diagrams, the kinds of assessment that are included and how they relate to high-stakes testing, and what kinds of teacher support is provided. From the presentation, teachers will learn what options of materials at the course level exist and how to examine digital materials to see underlying principles and structure.

Jere Confrey
North Carolina State University, Raleigh
Philip Daro
Pearson, London, England

GRAND BALLROOM A (WESTIN)

658 Differentiating with Tiered Lessons and Small-Group Instruction

Pre-K–2 Session

One-size-fits-all, whole-group approaches are largely ineffective in differentiating for today’s diverse classrooms. You’ll leave this session with strategies for giving targeted instruction at each student’s level. Join us to learn how to use menus, tiered lessons, and small groups to meet the needs of all learners.

Carrie S. Cutler
University of Houston-Downtown, Texas

659 Engaging with the Common Core through Ants and Activity Sheets

Pre-K–2 Session

A picnic with pesky ants will set the stage as participants learn to integrate other subjects with standards falling under the domains of Counting and Cardinality, Operations and Algebraic Thinking, and Numbers and Operations in Base Ten. A focus will be placed on evaluating consumables and recognizing the differences between activity sheets and worksheets.

Claudia R. Burgess
Salisbury University, Salisbury, Maryland
Chin-Hsiu Chen
Salisbury University, Salisbury, Maryland

660 Increase Student Engagement and Efficacy with Math Workstations

3–5 Session

Having difficulty engaging all learners in mathematics? Struggling to differentiate for varying abilities and learning styles? Follow one urban elementary school’s journey from low student engagement and “probationary status” to high engagement and “meeting expectations”—all through the use of math workstations!

Tayo S. McGuirk
Denver Public Schools, Colorado
Laurel Pate
Denver Public Schools, Colorado

661 Effective Fractions Instruction and Assessment for At-Risk Students

3–5 Session

This session highlights advances, produced by the Center for Improving Learning of Fractions and funded by the Institute of Educational Sciences, regarding assessment and design of effective interventions for students who struggle with fractions. Three presentations illustrate the assessments, interventions, and implications for CCSSM.

Russell Gersten
Instructional Research Group, Los Alamitos, California
Robert Ochsendorf
National Center for Special Education Research, Washington, D.C.
Karen Karp
University of Louisville, Kentucky

107 A (BCEC)
108 (BCEC)
209 (BCEC)
255 (BCEC)
9:30 A.M.–10:30 A.M.

662
**Inside a Dynamic Math 2.0 Classroom**

6–8 Session

The Internet, cloud computing, and portable devices are making inroads into the classroom. What does a Web 2.0–based classroom involving dynamic math software that produces active learning look like? Examples of collaborative, math 2.0 activities will be shared.

Ihor Charischak

663
**Making Sense of Complex Fractions**

6–8 Session

Students’ understanding of complex fractions provides them with a foundation for understanding fraction topics such as division. Come explore strategies and problems to help students represent situations with complex fractions, and learn instructional techniques to help them develop these ideas through modeling.

Jennifer M. Tobias
Illinois State University, Normal
Elif Safak
Illinois State University, Normal

664
**Ratio Tables and Tape Diagrams #notjustforRP**

6–8 Session

Students learn how to use ratio tables and tape diagrams in the Ratios and Proportional Relationships domain of CCSSM. Then what? In this interactive session, we will explore how these tools can be used to build procedural fluency from conceptual understanding in other content domains, including the Number System and Expressions and Equations.

Melissa Waggoner
Howard County Public Schools, Ellicott City, Maryland
Lindsay Kelley
Howard County Public Schools, Ellicott City, Maryland

665
**Numbers! Count on Them to Link Algebra and Geometry Content**

9–12 Session

This session will offer suggestions on ways to invigorate mathematics instruction by focusing on number as the lens through which we build and blend algebraic and geometric concepts and their application. Several number families will be used to illustrate how the mathematical practice standards are facilitated and implemented.

Margaret J. Kenney
Boston College, Chestnut Hill, Massachusetts

666
**The Algebra Artist: Drawing with Desmos**

9–12 Session

Have your students become Algebra Artists by using free Desmos online graphing software to create drawings from algebraic equations and inequalities. Inspire your students to think deeply and holistically about graphing as they create beautiful images. Practice and pedagogy are discussed with plenty of student creations as illustration.

Darin E. Beigie
Harvard-Westlake School, Los Angeles, California

667
**What Makes Algebra Difficult for Some Students to Learn?**

6–8 Session

Algebra is the gateway to higher mathematics and STEM careers. Yet, studies show the failure rate is often 40 to 50 percent. What is it about algebra that is so challenging for many students? In this session we will explore what we know from research about the conceptual obstacles that students often face as they engage with algebra.

Rachel Harrington
Western Oregon University, Monmouth, Oregon
Steve Rhine
Pacific University, Forest Grove, Oregon
9:30 A.M.—10:30 A.M.

668 Conceptualizing the Trigonometric Functions Using Technology
9–12 Session
In this session, I will present activities that can be used to engage students in reasoning about the trigonometric functions through a interactive geometry environment. This approach can help students build conceptual understanding of the functions and their properties, thereby reducing meaningless memorization and mnemonics. Laptops welcome!

Joshua Hertel
University of Wisconsin-La Crosse

669 Webinars as a Pathway to Understanding CCSSM
9–12 Session
CCSSM provides an opportunity for educators in multiple states to enact dialogue over common standards. University led webinars provide a pathway to discover how teachers can best implement CCSSM via a shift in curricula, pedagogy, and assessments. We will complete an activity centered around MP.4: “Model with mathematics.”

Sean D. Nank
American College of Education, Indianapolis, Indiana

670 Anybody Know What Time It Is? Class Challenge!
9–12 Session
Looking for ice-breakers and challenging extra problems? We were too! Mathematics Teacher calendars are a great source. Participants will receive a selection of our favorite problems from the MT calendars arranged by topic to help you locate subject-appropriate problems. Solutions, implementation in group settings, and assessing student results will be discussed.

Charles E. Emenaker
University of Cincinnati Blue Ash, Ohio
Gene Kramer
University of Cincinnati Blue Ash, Ohio
Poranee Julian
University of Cincinnati Blue Ash, Ohio

671 Strategy in Sports: Conditional Probability and Expected Value
9–12 Session
Should we go for it on fourth down? Should a runner try to steal second base? In the Common Core, students are asked to use probability to make decisions. In this session, we will use sports contexts to illustrate how expected value and conditional probability calculations can be used to evaluate strategies in sports.

Josh Tabor
Canyon del Oro High School, Oro Valley, Arizona

672 Native American–Based Mathematics Materials for Undergraduate Courses
Higher Education Session
This project develops and researches mathematics materials based in the culture and mathematics of Native American people for integration into undergraduate courses. These materials are classroom ready and have been piloted. Topics include number theory, geometry, statistics, and education. Lessons, data, and analysis will be shared.

Miles R. Pfahl
Turtle Mountain Community College, Belcourt, North Dakota
Charles P. Funkhouser
California State University, Fullerton

672.1 An Introduction to JUMP Math (Pre-K–8) Exhibitor Workshop
JUMP Math is a nonprofit organization dedicated to closing the math achievement gap in first- to eighth-grade classrooms. John Mighton will present to give participants a better understanding of JUMP Math principles and practices and an overview of how teachers, parents, and school administrators can use JUMP Math’s Common Core curriculum.

JUMP Math
Toronto, ON, Canada
9:30 A.M.–10:30 A.M.

**672.2  **

Leadership Pathways for Exemplary K–12 STEM Teachers

(Pre-K–12) Exhibitor Workshop

K–12 teachers are invited to join us as we discuss and explore the National Science Foundation (NSF)'s teacher leadership programs, which include the Presidential Awards for Excellence in Science and Mathematics Teaching (PAEMST), Master Teaching Fellowships Track of the Robert Noyce Teacher Scholarship Program, and STEM-C Partnerships Program.

Booz Allen Hamilton (PAEMST)
Herndon, Virginia

153A (BCEC)

**672.3  **

Blended to Hybrid to Flipped Learning by StraightAce Learning

(3–8) Exhibitor Workshop

Advances in teaching methods have now made the flipped, blended, and hybrid learning models almost commonplace. Sometimes the terminology can be as new as the technology. We will shed some light on the subjects and provide real-world examples of successful implementation in the classroom.

Benesse America, Inc.
New York, New York

151A (BCEC)

**672.4  **

Mathspace: Why You’ll Never Grade Math Assignments Again. Seriously!

(6–12) Exhibitor Workshop

Meet Mathspace. You’ve seen it all, right? Adaptive learning? Yep. Handwriting recognition? Umm... Every math question graded step-by-step? Whoa, that’s new! Imagine: automatic grading, so you focus on teaching; handwritten answers, showing full work, with real-time feedback; no more multiple choice! World-class math software—come get a FREE trial!

Mathspace
New York, New York

151B (BCEC)

**672.5  **

Useractive College Mathematics In High School Classrooms

(9–12) Exhibitor Workshop

We discuss the useractive pedagogy of the NetMath Program for online math courses at the University of Illinois. We also provide an overview of the Partner High School program in which high school teachers mentor students in blended format for college credit. Designed for high school teachers and administrators; attendees may use a laptop and Chrome to participate.

NetMath at the University of Illinois
Champaign, Illinois

105 (BCEC)

**672.6  **

Building Student Motivation, Engagement, & Growth in Mathematics Learning

Exhibitor Workshop

Experience a Zometool investigation, exploring firsthand the possibilities Zometool opens for interactive, engaging mathematics learning. All investigations are aligned with national standards, built on research-based practices, designed for use with teachers’ own unit plans, and differentiated to meet a range of learner needs in classrooms today.

Zometool, Inc.
Longmont, Colorado

152 (BCEC)

9:45 A.M.–11:00 A.M.

**673  **

An Instructional Cycle to Support Student Learning of Number in K–3

Pre-K–2 Gallery Workshop

This workshop will explore the connection between formative assessment and instruction to support student learning of number. Participants will analyze video to identify evidence of children’s understanding of number. That evidence will be used as we engage in tasks and consider ways to modify instruction to address demonstrated student needs.

Catharina W. Middleton
East Carolina University, Greenville, North Carolina

104 A/B (BCEC)
674  
Preschool Mathematical Practices: Learning to Make Sense and Persevere  
Pre-K–2 Gallery Workshop  
Meeting Common Core expectations in kindergarten will be difficult for underprepared children. Watch and discuss video of kids playing (and play yourself) developmentally appropriate mathematics games that address early childhood content standards and motivate pre-K children to make sense of problems and build problem-solving persistence and stamina.  
Kristen E. Reed  
Education Development Center, Waltham, Massachusetts  
Jessica M. Young  
Education Development Center, Waltham, Massachusetts  
253 A (BCEC)

675  
Using Mech-a-Blocks to Explore Shapes, Patterns, and Transformations  
Pre-K–2 Gallery Workshop  
How can emergent readers learn to identify and manipulate shapes, patterns, and transformations? Learn to use large-scale pattern blocks that include holes and fasteners for connecting them to make structures and mechanisms. You’ll explore Mech-a-Blocks for yourself, develop strategies for using them, and discuss examples of children’s work.  
Cherubim Cannon  
P.S. 5, Brooklyn, New York  
Travis Sloane  
East Side Elementary School, P.S. 267, New York, New York  
Lesia Wilder  
Teachers College Community School, New York, New York  
162 A/B (BCEC)

676  
What’s Black, White, and Ten All Over?  
Pre-K–2 Gallery Workshop  
This hands-on session will unravel the power of ten-frames as a teaching tool you can use to incorporate the new standards as practices come to life. We will explore a variety of activities including how to get started, games, and even open-ended problems. Video clips and student work will give you a glimpse of how this could look in the classroom.  
Lisa K. Rogers  
Math Solutions, Sausalito, California  
Megan L. Brewer  
Math Solutions, Sausalito, California  
206 A/B (BCEC)

677  
Foundations of Fluency: Hit the Ground Running  
Pre-K–2 Gallery Workshop  
How can we best prepare our students? By providing a connected progression of instruction that is a roadmap to learning! In this hands-on workshop, we will trace the trajectory of addition and subtraction from pre-K to grade 2 and beyond. Students learn best by doing, so we will share innovative best practice lessons and strategies.  
Suzanne Belahmira  
ETA hand2mind, Vernon Hills, Illinois  
Diana Carry  
ETA hand2mind, Vernon Hills, Illinois  
Gayle Stahl  
Independent Mathematics Consultant, Houston, Texas  
210 A (BCEC)

678  
Comprehension Composition Computation (Comp³): Linguistic Access to Mathematical Tasks  
3–5 Gallery Workshop  
As students make sense of problems and persevere in solving them, struggling readers may not be able to demonstrate their mathematical understandings. Participants will investigate linguistic barriers that students must overcome when comprehending written math tasks and will share ideas for supporting students as they make sense of multiplication word problems.  
Jennifer J. Jordan  
University of Tennessee, Knoxville  
Geri A. Landry  
University of Tennessee, Knoxville  
210 A (BCEC)
9:45 A.M.–11:00 A.M.

**679**

**Fractions: Tools, Tasks, and Talk**  
3–5 Gallery Workshop

Are you looking for resources that meet students’ needs in understanding fractions? Are you struggling to find tools that make sense of fractions? This interactive session will share ideas to help build understanding of fraction sense. Key ideas: “What is the whole/part/fraction?”, unit fractions, and various tools needed to build understanding.

Debbie M. Thompson  
Wichita Public Schools, Kansas

Lynette R. Sharlow  
Wichita Public Schools, Kansas

**680**

**Kids Teaching Kids?**  
3–5 Gallery Workshop

To be able to teach a concept, one must know it! Using the format of a measurement fair, participants will actively engage in learning how to have upper elementary students design measurement learning tasks for primary students, resulting in a school-wide event. Learning how to measure has never been easier! Handouts will be provided.

Sue Vohrer  
Anne Arundel County Public Schools, Annapolis, Maryland

**681**

**Let’s Talk Mathematics: The 24 Game Promotes Classroom Fluency**  
3–5 Gallery Workshop

Attendees will participate in a number of hands-on activities designed to engage, challenge, and motivate students. Activities will include a number of games from the 24 game series. Number and pattern sensing, critical thinking skills and “speaking mathematically” will all be part of this exciting workshop.

Cred Dobson  
Suntex International, Easton, Pennsylvania

Shawn Collier  
Suntex International, Easton, Pennsylvania

**682**

**Making Games Meaningful**  
3–5 Gallery Workshop

Meaningful games have a positive impact on mathematics achievement. Learn how to maximize this positive impact by strategically using math games for formative assessment and differentiation. Key themes will include the balance between procedural and conceptual development, manipulative use, and strategies for moving from concrete to abstract.

Lisa B. Canipelli  
Learners Advantage, McDonough, Georgia

Carole Tilley  
Learners Advantage, McDonough, Georgia

**683**

**Literature and Manipulatives: Connect Them to Increase Rigor and Understanding**  
3–5 Gallery Workshop

Literature enlivens math concepts and invites understanding. Manipulatives take the learning to another level by making it experiential. In this hands-on session, see how books and manipulatives used together can give students a rich approach to place value, exponents, scaling, ratio, proportion, and problem-solving.

David M. Schwartz  
Author, Oakland, California

Sara Delano Moore  
ETA hand2mind, Vernon Hills, Illinois

**684**

**“The-Music-Is-Not-in-the-Guitar” and Other Lessons from Yoda (and Morpheus)**  
6–8 Gallery Workshop

Wondering how you can help the local math community to form consensus and navigate the transitioning landscape without unnecessary frustration? Come to this pragmatic guru session to untangle the manifold of standards/curriculum/instruction/assessment and dueling beliefs. “Musicians” will be supported and inspired to improve their craft.

Andrew Chen  
EduTron Corporation, Winchester, Massachusetts

George L. Johnston  
EduTron Corporation, Winchester, Massachusetts
9:45 A.M.–11:00 A.M.

685
Build Understanding with Geofix Pieces and Engaging Tasks
6–8 Gallery Workshop
Geofix pieces are snap-together polygons that can be used to explore characteristics and properties of polygons and polyhedra. A collection of engaging tasks related to grades 6–10 geometry standards will be presented, focusing on angle measure, symmetry, similarity, transformations, surface area, and more.
Laurie Boswell
The Riverside School, Lyndonville, Vermont
205 A (BCEC)

686
Digital Learning to Address a Concept-Driven, Diverse Learning Environment
6–8 Gallery Workshop
We will model a personalized learning environment by blending traditional and digital methods in conceptual development of fractions to algebra. Our mind-set will be on “understanding why” rather than “remembering how.” Participants receive access to software and three-part lessons to support rich discussion, seamless integration, and differentiation.
Rudy V. Neufeld
Thames Valley Schools, London, Canada
157 B/C (BCEC)

687
STREAMing with Common Controversial Core
6–8 Gallery Workshop
Participants will experience activities related to middle grades mathematics integrated with art, engineering, and technology in an effort to demonstrate that the mathematical practices and habits of mind outlined with the Common Core truly benefit learners in a myriad of ways. The overarching theme will center upon understanding similarity.
Judith A. Deeley
Guardian Angels Catholic School, Clearwater, Florida
204 A/B (BCEC)

688
The Case of the Mischievous Solids: Engaging in the Mathematical Practices
6–8 Gallery Workshop
Help solve the Case of the Mischievous Solids while engaging in all of the Standards for Mathematical Practice. Participants will explore the properties of solids, their nets, vertices, edges, and faces, as well as the shadows they cast, to determine which shapes are guilty beyond a reasonable doubt of making a mess in the mathematics classroom.
Patricia D. Hunsader
University of South Florida Sarasota-Manatee
252 A (BCEC)

689
Truth, Lies, and Statistics: Data Analysis in Middle School
6–8 Gallery Workshop
Data analysis is proving to be a critical twenty-first-century skill. Middle grades students need to effectively organize, represent, and draw conclusions from data. This workshop will share a variety of problems to teach students these skills and challenge their thinking about what numbers tell them.
Mark D. Jones
Mansfield Middle School, Storrs, Connecticut
210 C (BCEC)

690
Do the Math: Crafting Meaningful Tasks
9–12 Gallery Workshop
Creating tasks that are meaningful to our students is somewhat of an overwhelming task. How do we spark student interest? Come experience meaningful tasks like: Can you really make money just wearing a shirt? As we do the math, we will collaborate with others to learn simple steps to craft your own meaningful tasks.
Jennifer North Morris
Math Coach/Specialist, Tucson, Arizona
John Berray
West Hills High School, Santee, California
258 C (BCEC)
9:45 A.M.–11:00 A.M.

691
**Algebra II & Trigonometry: Wrap Your Brain and Hands around It!**

*9–12 Gallery Workshop*

Participate in some fun, quick activities to engage you and your students. Discover how simple things like M&M’s, toothpicks, paper plates, patty paper, rope, movement, and singing will spice up your teaching and help your kids retain what they learn. Wrap your brain and hands around several activities including the Trig hand jive.

Gary Kubina  
Retired Math Teacher, Mobile, Alabama  
Beverly Kubina  
Retired Math Teacher, Mobile, Alabama

257 A/B (BCEC)

692
**What Are Residuals and Why Do I Need Them?**

*9–12 Gallery Workshop*

The topic of residuals shows up in many state standards, including Common Core. But what are residuals? Why is it important to understand and use them? What information do residuals provide that other statistical data do not? Come to this session and find out and leave with a classroom-ready activity.

Sharon Taylor  
Georgia Southern University, Statesboro

212 (BCEC)

693
**Engaging, High-Level Mathematics Tasks Aligned with the Common Core**

*9–12 Gallery Workshop*

Participants will interact with engaging, classroom-ready, high-level mathematical tasks aligned with the Common Core standards. Discussions will include how tasks build students’ current knowledge, allow for multiple entry, connect with student interests, and require active participation. Participants will discuss development of high-level tasks.

Michelle Cetner  
North Carolina State University, Raleigh  
Emily Thrasher  
North Carolina State University, Raleigh

156 C (BCEC)

694
**Investigations of CCSSM Based on News Stories and Media**

*9–12 Gallery Workshop*

In this session, participants will study mathematical investigations based on contemporary news and media that align with CCSSM. Much of the time in the workshop will be devoted to solving problems and aligning the content with CCSSM. The importance of investigations, and the qualities of good and bad investigations, will be discussed.

John E. Donovan  
Plymouth State University, New Hampshire

102 A/B (BCEC)

695
**Assessment: What’s It All About, Alfie?**

*Preservice and In-Service Gallery Workshop*

Assessment and grading are not the same. Assessment helps teachers and students to identify what they know and don’t know, and it provides opportunities to help students improve their understanding and performance. This session will begin with a hands-on activity and will culminate in a discussion of assessment techniques for improved instruction.

Neil D. Cooperman  
Association of Mathematics Teachers of New Jersey, Chester  
Stephanie H. Cooperman  
School District of the Chathams, New Jersey

258 B (BCEC)

11:00 A.M.–12:00 P.M.

696
**Creative Mathematics Is Not an Oxymoron within the Core Curriculum**

*6–8 Session*

Arithmetic could be defined as answering the question whereas mathematics could be defined as questioning the answer. Mathematics can be highly creative in its own right when taught through a conceptual base rather than a procedural one. Teaching through a conceptual base fosters creativity in the student and excitement in the classroom.

Elaine Watson  
Watson Consulting, Montpelier, Vermont  
Rachel McAnallen  
Zoid and Company, Storrs, Connecticut

107 A (BCEC)
697
Learning Meaningful Mathematics with iPads: Beyond Skill and Practice Apps
General Interest Session
iPads are increasingly common in K–12 classrooms and can be powerful tools for learning mathematics. Join us as we look beyond skill and practice apps and explore how iPads can support rich mathematics experiences. Learn about mathematics, communication, and assessment apps and share how you are using iPads to improve students’ quality of learning.
Amanda Thomas
Penn State Harrisburg, Middletown, Pennsylvania

698
When Am I Ever Gonna Use Math in Real Life?
General Interest Session
Sound familiar? If you are a math teacher, then you have no doubt heard this question countless times throughout your career. Why should your students learn math? Looking for some new, fresh responses? Join us for some reflection and laughter as we role-play a slew of serious and humorous responses to this million-dollar question.
Adam R. Poetzel
University of Illinois, Champaign-Urbana

699
When Words Get in the Way (of the Math)
6–8 Session
Being aware of the role of language in mathematics teaching and learning requires an understanding of the linguistic demand structures present in teaching word problems. This session will introduce relevant and consistent methods for teachers to facilitate student access to high-level mathematics.
Michael Gilbert
University of Massachusetts Boston
Fabián Torres-Ardila
University of Massachusetts Boston

700
Bringing CCSS “Coherence” into Focus: It Begins in Kindergarten!
Pre-K–2 Session
Learn how we build students’ number sense and a strong foundation for operations and algebraic reasoning in an urban kindergarten. We will share how an emphasis on cardinality and decomposition strategies is developed in a coherent CCSS-aligned program that uses a Japanese textbook and tools, student notebooks, and bansho (blackboard design).
Mary N. Leer
VERA: Leer Educational Consulting, LLC, Lancaster, Pennsylvania
Alexandria Linn
Harlem Village Academies, New York, New York
Hayley Spira-Bauer
Harlem Village Academies, New York, New York

701
Good Questions Link Children, Number Sense, Stories, and the Common Core
Pre-K–2 Session
This session will share how children (pre-K to 2), when answering and asking good questions while engaged in mathematical investigations in the context of children’s literature, can develop number sense, along with the skills of reasoning, problem solving, and communication, as described in the Common Core Standards for Mathematics and Language Arts.
Rita C. Janes
Rita Janes Educational Solutions, St. John’s, Canada
Elizabeth L. Strong
Education Consultant, St. John’s, Canada
11:00 A.M.–12:00 P.M.

**702**

**Mathematizing Childrens Books**

**Pre-K–2 Session**

This presentation will focus on the integration of mathematical discussion with shared reading experiences. We will describe the process of mathematizing read alouds, developed for use with teachers and young children, to help facilitate empowering and engaging learning experiences that foster joy and wonder for mathematics.

Allison Hintz  
University of Washington Bothell  
Antony Smith  
University of Washington, Bothell

**703**

**CCSSM: How Far Do We Have to Back Up?**

**3–5 Session**

Given that standards such as the Common Core identify the end target of instruction, the question remains: How far should we “back up” in order to begin this process of moving towards the target? In this session, we will examine student work related to division of fractions and discuss how the students’ ideas tell us where to begin an instructional sequence.

Angela T. Barlow  
Middle Tennessee State University, Murfreesboro  
Kristin S. Hartland  
Middle Tennessee State University, Murfreesboro  
James C. Willingham  
Middle Tennessee State University, Murfreesboro

**704**

**Getting Students Invested in the Process of Problem Solving**

**3–5 Session**

Analyzing student responses to feedback over the course of the school year, we found that responding to students’ ideas throughout the problem-solving process, rather than just to their product at the end, has led to students being more engaged, less reliant on their parents, and more reflective. It also provides a record of their thinking.

Debbie Wile  
Wallingford Elementary School, Pennsylvania  
Annie Fetter  
The Math Forum @ Drexel, Philadelphia, Pennsylvania

**705**

**Using Physical/Virtual Manipulatives to Teach Multiplication, Division, and Fractions**

**3–5 Session**

Physical and virtual manipulatives significantly affect the development of students’ problem-solving skills and conceptual understanding. Participants attending this session will learn how to use physical and virtual manipulatives for affirming a relational understanding of math concepts by making connections between visual depictions and symbolic models.

Dan Sinclair  
Mastery Educational Services, Fallbrook, California  
Joseph Sencibaugh  
Webster University, St. Louis, Missouri

**706**

**Connecting Math and Literature in the Middle School**

**6–8 Session**

Stories can help young people find the fun in math, play with ideas, and elucidate their thinking. This presentation will explore how literature can help students enlarge their view of mathematics. Attendees will leave with literary excerpts, a list of recommended books that combine math and literature, and a set of fun student challenges.

Penny Noyce is a physician, publisher, and education advocate. She attended Harvard and Stanford Universities, did a residency in internal medicine in Minneapolis, and practiced in Boston and Newton. In 1992 she became a founding trustee of the Noyce Foundation, which supports improvements in K–12 mathematics and science education nationwide. For eight years Penny served as co-Principal Investigator of Massachusetts’ NSF-funded State Systemic Initiative, PALMS. More recently, she has turned to writing fiction for middle school readers, including *Lost in Lexicon, an Adventure in Words and Numbers* and a number of books in the Galactic Academy of Science series. Penny serves on the Massachusetts Board of Elementary and Secondary Education as well as on the boards of COMAP, the Libra Foundation, the Rennie Center for Education Policy, and the AAAS Public Outreach advisory board.

Pendred E. Noyce  
Tumblehome Learning/The Noyce Foundation, Boston, Massachusetts
Engage Your Students in Learning

You need the best strategies to prepare your students for success, and NCTM’s Interactive Institute on High School Mathematics offers a variety of activities and tactics to effectively address the eight Mathematics Teaching Practices from Principles to Actions, as well as the Common Core mathematical practices and the NCTM process standards—giving your students better opportunities to examine, interpret, and think critically about math concepts.

The experience will be suited to your interests—you’ll take part in sessions and be grouped with educators according to your strand of focus:

- Algebra 1 / Integrated Year 1
- Algebra 2 / Integrated Year 3
- Geometry / Integrated Year 2

Plan to attend if you are a—

- high school mathematics teacher;
- high school supervisor;
- college mathematics teacher;
- math coach and teacher leader;
- teacher educator;
- preservice teacher.

Learn more and register at [www.nctm.org/hsmath](http://www.nctm.org/hsmath).

Space is limited—REGISTER TODAY!  [www.nctm.org/hsmath](http://www.nctm.org/hsmath)
11:00 A.M.–12:00 P.M.

707
DIY Session: Secrets behind Building a Better Math Lesson
6–8 Session
Is your math class looking a little tired around the edges? Join PBS for a hands-on “DIY” session and find out how you can construct the ultimate math experience using digital media and technology! You’ll walk away with access to thousands of free resources and cool tech tools you can use to engage students inside and outside of the classroom.

John Sessler
PBS, Arlington, Virginia
153 C (BCEC)

708 EQ
Engaging Students with “Connect 4”: Algebra, Geometry, Probability, and Statistics
6–8 Session
All students, and particularly African American and Hispanic students, should have a variety of engaging opportunities that allow them to apply mathematics to their personal experiences. In this session, you will experience and leave with innovative activities designed to transform your teaching and the way your students view mathematics.

Brea C. Ratliff
Southern Methodist University, Dallas, Texas
Sharri C. Zachary
Southern Methodist University, Dallas, Texas
104 C (BCEC)

709
Integrating Authentic Economics Applications into a High School Mathematics Curriculum
9–12 Session
This session explores ready-to-use activities that integrate authentic economic applications into high school mathematics courses. Participants will take part in hands-on activities that develop understanding of economic concepts such as diminishing returns, supply and demand, profit maximization, and marginal profit.

Adam Lavallee
Episcopal Academy, Newtown Square, Pennsylvania
108 (BCEC)

710
The Transformers Are Coming!
6–8 Session
Transformations are an important topic in geometry in the middle grades and beyond. Participants will be engaged with transformations from different points of view, and there will be an emphasis on producing transformations in the coordinate plane. Participants will receive ready-to-use activities for their classes. Make your students Transformers!

Clifton Wingard
Delta State University, Cleveland, Mississippi
252 B (BCEC)

711
What Do My Algebra Students Really Know?
9–12 Session
Create assessment questions that probe understanding beyond procedures. Discover samples and ideas for turning procedural tasks into questions that require understanding and reasoning. Construct chapter tests that balance fluency with procedures, conceptual reasoning, and problem solving, and that can assess students’ development of core practices.

Judith M. Kysh
San Francisco State University, California
157 A (BCEC)

712 PS
Problems Worth Solving
9–12 Session
A brief history of the HiMCM competition will be given, including a selection of problems and solutions. Attention will be paid on how to introduce modeling effectively into the high school curriculum and meet the CCSSM practices.

Solomon Garfunkel
COMAP, Bedford, Massachusetts
254 A/B (BCEC)
11:00 A.M.–12:00 P.M.

**713**

**Common Core: Where to Focus to Promote College Math Success**

9–12 Session

We will examine best practices of high school teachers in following the Common Core standards in their classrooms. In addition, we will look at the opinions of faculty in mathematics and the sciences regarding which topics from Common Core should receive more focus when teaching grades 9–12 in order for students to succeed in college courses.

Shlomo Libeskind
University of Oregon, Eugene

**205 B (BCEC)**

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11:30 A.M.–12:00 P.M.

**715**

**Key Strategies and Common Misconceptions about Discussions in Math Class**

General Interest / All Audiences Burst

Participants will learn three specific strategies that they can implement in their classrooms to increase the productivity of whole-class discussions. Participants will also consider how two common misconceptions about whole-class discussions may actually erode the effectiveness of the student talk.

Nancy C. Anderson
Consultant, Pembroke, Massachusetts

**109 A/B (BCEC)**

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11:00 A.M.–12:00 P.M.

**714**

**Modeling Noise-Cancelling Headphones with Trigonometric Functions**

9–12 Session

Ever wondered how noise-cancelling headphones block out ambient noise in a room? This task was designed for students to reason about transformations and compositions of trig functions using GeoGebra to model sound waves. Videos and artifacts of student work and reasoning will be provided. Bring a laptop with GeoGebra or GSP to engage in the task!

Blake Whitley
North Carolina State University, Raleigh

Jennifer Nickell
North Carolina State University, Raleigh

Ashley Whitehead
North Carolina State University, Raleigh

**259 A (BCEC)**

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11:30 A.M.–12:00 P.M.

**718**

**Improving Mathematics Instruction through Lesson Study: Key Components and Outcomes**

3–5 Burst

In this presentation a diverse team of facilitators (mathematics coach, mathematician, mathematics educator, and principal) will discuss the key components of an effective professional development model which promoted growth in mathematical and pedagogical content knowledge of elementary school teachers in the areas of number sense and fractions.

Scott Schreiner
Kansas State University, Manhattan

Chepina Rumsey
Kansas State University, Manhattan

**160 B/C (BCEC)**

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11:00 A.M.–12:00 P.M.

**719**

**Show Me Adding Unlike Fractions!!!**

3–5 Burst

This session will describe a conceptual approach of fraction addition. The presenters will share three different models, the grid model, bar model, and line model, to show fraction addition. Join the session and learn how to use those models.

Hoyun Cho
Capital University, Columbus, Ohio

Moriah Myers
Capital University, Columbus, Ohio

Rachel Fountain
Capital University, Columbus, Ohio

**252 A (BCEC)**
11:30 A.M.–12:00 P.M.

**720**

**Geometry: It’s Not Just Squares and Triangles Anymore!**

3–5 Burst

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

Thomas Fox
University of Houston-Clear Lake, Texas

204 A/B (BCEC)

**721**

**Opening Space: Engaging Conversation in the Elementary Mathematics Classroom**

Research Burst

This qualitative research, informed by complexity theory, reports on data generated from the intervention of Open Space Technology (OST) in one grade 6 classroom. OST introduces an alternative methodology in mathematics instruction with a view to increasing student math talk. Discourse analysis provides insights into engagement and conversations.

Evan P. Throop-Robinson
Mount Saint Vincent University, Halifax, Canada

210 A (BCEC)

**722**

**Active Learning in Mathematics: Intellectual, Social, and Physical**

6–8 Burst

Getting middle schoolers actively engaged in learning math is important. But what does that really mean? This presentation will discuss three aspects of active learning in mathematics and activities that get students intellectually active, socially active, and physically active will be shared.

Linda Crawford
Georgia Regents University, Augusta
Susan Edwards
Georgia Regents University, Augusta

253 A (BCEC)

**723**

**Using the Flipped Classroom to Differentiate Instruction**

6–8 Burst

Through the use of flipped classroom in the math classroom, valuable class time is freed up for more face-to-face interaction between teacher and students. The learning needs of students can thus be better addressed through the use of differentiated instructions, activities, and assessments, which leads to a higher level of student engagement.

Sandi Suat Sie Kum
Raffles Girls’ School (Secondary), Singapore

156 A/B (BCEC)

**724**

**Yay! We Have Math Club Today!**

6–8 Burst

A successful math club needs engaging math tasks, puzzles, activities, and especially games! This program will provide hands-on activities with intrinsically interesting math topics, and also give the format of a popular math club. We will discuss what makes a math activity “fun” for students, and how to select activities for your club.

Mary Wiley
Millburn Public Schools, New Jersey

107 B/C (BCEC)

**725**

**Multiple Aspects of Mathematical Modeling**

9–12 Burst

Mathematical modeling is basic to productive investigative experiences as well as an instructional approach. Modeling tasks from algebra I will be used to compare and contrast descriptive modeling, that summarized a phenomena in compact form, and analytic modeling, that seeks to explain data on the basis of deeper theoretical ideas.

Melfried Olson
University of Hawaii, Honolulu
Judith Olson
University of Hawaii, Honolulu
Hannah Slovin
University of Hawaii, Honolulu

157 B/C (BCEC)
11:30 A.M.–12:00 P.M.

726 Creating a Classroom Community through Cooperative Learning and Mathematics Journals
Higher Education Burst

Creating a positive and supportive classroom community is an instrumental component toward attaining student success. This study implemented cooperative learning and mathematics journals as pedagogical tools in a diverse college mathematics classroom. Results indicate that students increased participation, social capital, and self-efficacy.

Michael A. Furuto
University of Hawai‘i - West O‘ahu, Kapolei
212 (BCEC)

727 Unique Perceptions of Limits in Calculus
Research Burst

This presentation extracts essential findings from my dissertation’s constructivist case-study on conceptual knowledge of limits, revealing unique perceptions students have about limits at a point, limits at infinity, and limits that do not exist. Modifying instructional practices and identifying common misconceptions can improve learning outcomes.

Margaret Smolinka Adams
Francis Marion University, Florence, South Carolina
162 A/B (BCEC)

728 Creating a Language and Culturally Responsive Learning Community for ELLs
9–12 Burst

Many English language learners (ELLs) struggle in mathematics classes on a daily basis. This presentation discusses ways to build a language and culturally responsive learning community by tapping into ELLs’ prior learning, providing language and culture support, and integrating language instruction into mathematics teaching.

Yu Ren Dong
Queens College, Flushing, New York
253 C (BCEC)

729 Implementing the Standards for Mathematical Practice in Lawrence, MA
General Interest / All Audiences Burst

Lawrence, the poorest city in Massachusetts, faces myriad educational challenges that accompany poverty and immigrant communities. These led to a state takeover (the first in Massachusetts history) of Lawrence’s schools. Using the Common Core Standards for Mathematical Practice as a guide, we are transforming math education in Lawrence’s six high schools.

Andy Katz
Lawrence Public Schools, Massachusetts
Shigehito Tanaka
Lawrence Public Schools, Massachusetts
206 A/B (BCEC)

730 Using Mathematical Practices to Develop Productive Disposition
9–12 Burst

We will share results from a five-week course designed to develop productive disposition by engaging in inquiry projects that mimic mathematical research. We will outline the course design, provide sample activities, and will describe the effects of the course on students’ perceptions of mathematics and of their own mathematical abilities.

Duane Graysay
Pennsylvania State University, University Park
Sara Jamshidi
Pennsylvania State University, University Park
Monica J. Smith
Pennsylvania State University, State College
210 C (BCEC)

731 Helping Students Visualize Mathematical Concepts in Three Dimensions
Higher Education Burst

Many excellent students have trouble understanding topics in three dimensions. One reason for this difficulty is that three-dimensional models are drawn in two dimensions, resulting in models that are difficult for students to understand. Several three-dimensional representations of mathematical concepts will be presented.

Sharon L. Crumpton
Belmont University, Nashville, Tennessee
102 A/B (BCEC)
Field Fridays: Immersing Preservice Teachers in Learning Inquiry Mathematics Instruction

Preservice and In-Service Burst

Inquiry-based learning is foundational to our elementary mathematics methods course, yet our preservice teachers’ prior experience with mathematical inquiry in elementary settings is typically thin. Field Fridays provide contexts and support for immersing our PSTs in mathematical inquiry with children during the methods semester, thus anchoring their learning.

Eula E. Monroe
Brigham Young University, Provo, Utah
Joseph S. Rino
Plymouth State University, New Hampshire

Math, the Language of a Creative Genius

General Interest Session

Dr. North shares with the audience some of his exciting work in research, engineering, and television; and how creativity and fun can stem from mathematics.

Mike North is involved in all aspects of our technological charge from inventing new materials and technologies in a cleanroom to creating cutting-edge prototypes on Discovery Channel’s Prototype This! He commonly speaks on the status and future of science and technology and is an energetic and charismatic science and technology advocate inspiring grade-schoolers to CEOs.

North earned a PhD and a masters in Materials Science and Engineering from the University of California at Santa Barbara. During his graduate work, he designed and fabricated the world’s first adhesive that can be turned on and off electronically. His scientific interests delve into specialties such as biomimetics, micro/nanofabrication, nanoscale microscopy, and micro/nanomechanical characterization. His investigations have been published in leading scientific journals, including Advanced Materials and Nature.

Mike North
Discovery Channel, Silver Spring, Maryland

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**Misconceptions Squared!**
**Date:** April 16, 2015  
**Time:** 12:30pm  
**Location:** Room # 153A

**Understanding the Most Challenging Common Core Math Standards**
**Date:** April 17, 2015  
**Time:** 3:30pm  
**Location:** Room # 153A

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Tips for a Rewarding Annual Meeting & Exposition

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• Access speaker handouts at www.nctm.org/planner.
• Become familiar with the layout of the Boston Convention and Exhibition Center and the Westin Boston Waterfront hotel by reviewing the floor plans on pages 178–181.
• Visit NCTM Central for the latest NCTM educational resources: Member Services, where you can pick up free resources and learn more about how NCTM can help you professionally; the Bookstore, where you can browse the latest titles; and the Networking Lounge, where you can enjoy free Wi-Fi and connect with other attendees.
• Stop by the Concierge Desk in the lobby for information on the Boston area.
• If you are attending the conference with colleagues, attend different presentations and share your learned knowledge after the conference.
• Silence cell phones during presentations.
• Visit the Exhibit Hall, where more than 200 exhibitors will share the latest educational products.
• The more you participate in the presentations, the more you will get from the conference.
• Tell us about your conference experience by responding to the post-conference online survey.
• Be safe! Remove your name badge when you leave the conference facilities at the end of the day.

Registration and Access to Presentations
You must wear your badge to enter all presentations and the NCTM Exhibit Hall. NCTM will charge a $10 fee for replacement badges.

By registering for the NCTM 2015 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.

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 13–15, at the Westin Boston Waterfront. The Research Conference Registration Area is located in the Grand Ballroom Foyer.

The Research Conference will open with a poster session in Grand Ballroom C/D beginning at 5:00 p.m. The Opening Session will take place at 7:00 p.m. on Monday, April 13, followed by a welcome reception. Concurrent sessions will begin at 8:30 a.m. on Tuesday, ending with a research poster session. The Wednesday program begins at 8:30 a.m. with a Linking Research and Practice Plenary, followed by concurrent sessions until 4:00 p.m. Registered NCTM Annual Meeting attendees may attend Wednesday’s Research Conference presentations at no extra charge with their badge.

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Wi-Fi Access
The Boston Convention and Exhibition Center offers complimentary wireless throughout the meeting rooms and lobby areas. In the Exhibit Hall, enjoy complimentary Wi-Fi in NCTM Central’s Networking Lounge.

Conference App
The NCTM conference app, available on Apple and Android mobile devices, as well as a mobile Web app for Windows Mobile and BlackBerry 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 #NCTMBOSTON); rate presentations; and connect with other attendees. Visit www.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 www.nctm.org/planner.

All Year Long
When you return home, don’t forget to download NCTM’s free Android or iPhone app. The NCTM app gives you easy, efficient access to timely NCTM information throughout the year—from updates on new publications and best sellers to the latest information on upcoming conferences and professional development opportunities. You can be up to the minute on NCTM activities, teaching tips, and classroom resources. The new app also includes Facebook and Twitter feed updates. Visit www.nctm.org/nctmmobile/ for more information and to download the app.
General Information

NCTM Central
Check out NCTM Central. This exciting area has everything “NCTM” all in one convenient location in the Exhibit Hall:

• Pick up free take-home activities and resources, sample journals, and more at Member Services. You’ll have the chance to update your membership information, learn more about the benefits, and participate in a prize drawing. Plus, when you join or renew your NCTM membership you will receive a free t-shirt. Supplies are limited.
• View and play online math strategy games while learning about NCTM’s Illuminations project and other online resources.
• Listen to NCTM journal editors present short sessions that discuss how to write an article for NCTM journals, become a reviewer, and more at the Networking Lounge. A schedule is available on page 172 and in the on-site Daily News.
• Relax, mingle with other attendees, check your email, and stay connected with the latest social media updates in the Networking Lounge. Download the conference app to receive alerts for scheduled networking meetups!

NCTM Central: a space with new ideas and resources to help you in every way imaginable. Check us out in the Exhibit Hall during exhibit hours.

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Save 25% off the list price on all purchases made at the on-site NCTM Bookstore, located in the Exhibit Hall at the Boston Convention and Exhibition Center. View firsthand all the publications that NCTM has to offer. You will also find a variety of specialty products that you can use as gifts, prizes, and incentives to spread the word about the importance of mathematics. Start your wish list today by previewing NCTM’s wealth of resources at www.nctm.org/catalog.

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The NCTM Bookstore is not equipped to handle shipping from the meeting site. A business center located at each meeting facility is ready to assist you with your shipping needs.

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 Boston Convention and Exhibition Center. Some hotels are within walking distance of the convention center and will not have shuttle service. Routes and schedules will be posted in your hotel lobby and can be found online at www.nctm.org/bostonhousing. The schedule will be followed as closely as possible. If you have questions, please visit the shuttle desk located at the shuttle area entrance of the Boston Convention and Exhibition Center.

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The NCTM Information Booth is located in the lobby by the shuttle area of the Boston Convention and Exhibition Center. Local 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. At the end of each day, all lost-and-found items will be turned over to Convention Center Security.

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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 Thursday through Saturday, you can check your items at the bag check, located in the lobby by the shuttle area at the Boston Convention and Exhibition 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 Boston Convention and Exhibition Center during the NCTM conference. If you need medical services while in Boston, please check with your hotel concierge for the closest medical facilities. For any medical emergency, call 911 without hesitation.
For Your Child’s Safety
Because of the size and nature of the NCTM 2015 Annual Meeting & Exposition, this event is not an appropriate setting for children under 16 years of age. Your hotel concierge will be able to recommend activities available for children while you attend the conference. We appreciate your understanding and cooperation. Children 16 years and older will need to register as nonteaching guests. To register a nonteaching guest, stop by the Registration Area at the Boston Convention and Exhibition Center.

NCTM Clear Air Act
In accordance with a resolution of the 1978 Delegate Assembly, smoking is permitted only in designated areas.

Your Opinion Counts
Thank you for attending the NCTM 2015 Annual Meeting & Exposition. In the days after the Annual Meeting, you will receive an email asking you to evaluate your meeting 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.

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 and Friday from 8:00 a.m. to 5:00 p.m., and Saturday from 8:00 a.m. to 12:00 p.m. Check out the list of exhibitors and a floor plan of the Exhibit Hall on pages 186-203.

Exhibitor Workshops
Do you want more in-depth and personal interaction with exhibitors? Plan to attend the Exhibitor Workshops. Held on Thursday, Friday, and Saturday, these workshops offer a wide variety of topics. See the program for Exhibitor Workshop offerings, indicated by after the presentation number.

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NCTM invites you to share your teaching expertise and experience with your colleagues at one of NCTM’s highly regarded conferences, where mathematics teachers, administrators, and other members of the community come together to explore ideas, innovations, and best practices. NCTM looks to its members for effective and informative speakers.

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• Being an NCTM speaker can enrich your CV, your career, and your field.
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Affiliate Information
Association of Teachers of Mathematics In Massachusetts (ATMIM)
Anne Collins, collins2@lesley.edu

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Adult Numeracy Network
Lynda Ginsburg, ginsburg@rci.rutgers.edu

Association of Mathematics Teacher Educators
Megan Burton, mcb0042@auburn.edu

Association of State Supervisors of Mathematics
Charles Watson, chaswatson@sbcglobal.net

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Mylah Deliford, mdeliford@outlook.com

Council for Technology in Mathematics Education
Stephanie Cooperman, scooperman@chatham-nj.org

Council of Presidential Awardees in Mathematics
Donald Scheuer, mathguy1@verizon.net

National Council of Supervisors of Mathematics
Sharon Rendon, rendosha@gmail.com

North American Study Group on Ethnomathematics
Julie Herron, juherron@calpoly.edu

Society of Elementary Presidential Awardees
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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.
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908-444-4522
www.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 grades K-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!
Exhibitor Directory

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www.straightace.com/benesse_america.html
As the creator of StraightAce, Benesse America’s goal is to create high quality educational materials to provide children with tools that help them along the way. We aim to deliver these using years of experience and proven methodology. StraightAce is an online learning system for 6th, 7th and 8th grade Math and English. Aligned to Common Core State Standards, the system is designed to help teachers simplify lesson planning and make homework fun and interactive for middle school students.

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www.bannekermath.org
The Benjamin Banneker Association is a national non-profit 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.

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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 Inc.
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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 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 school wide trainings.

BuzzMath.com
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770-589-3810
www.buzzmath.com
Buzzmath is a mathematical mission that leads middle school students to proficiency through supported practice, all while providing teachers with the tools necessary to assess, differentiate, and target their instruction. Accessible anywhere, anytime students and teachers have quality math content and performance data at their fingertips! With over 300 Common Core aligned practice activities, representing more than 3000 problems, Buzzmath will guide your class to mathematical success!

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To provide schools and districts with opportunities for quality professional development services. To help teachers, administrators, and students see that mathematics is a tool for life and thinking that does not need to be scary. To provide value-added technological resources that help students understand concepts and deliver content better and more effectively. A CCSS aligned mathematics and technology integration PD company providing products and services that help teachers and students.

CanFigureIt LLC
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CanFigureIt™ promotes learning through discovery. Our new dynamic geometry product enables students to construct and explore mathematical relationships and work through proof problems interactively. By completing activities that incorporate inquiry, analysis, and reflection, students learn to apply their knowledge and develop sound arguments. CanFigureIt empowers students to take ownership of this process and provides teachers with data to follow progress in and out of the classroom.

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Booth: 1313
Pittsburgh, PA
412-690-2442
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Carnegie Learning offers print, digital, and professional development solutions for grades 6-12 that are proven effective at raising student achievement in math. Born from cognitive science research at Carnegie Mellon University, we are focused exclusively on helping students be successful in math to be prepared for college and careers in the 21st century.

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Carson-Dellosa proudly provides teachers, parents, and children around the world with the best possible educational materials including interactive digital resources; supplemental books for math, science, social studies, language arts, and early childhood; classroom decoratives; pocket charts; and games and manipulatives for prekindergarten through the eighth grade.

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Conceptua Math
Booth: 1033
Petaluma, CA
707-766-0584
www.conceptuamath.com
Conceptua® Math is an award-winning, online math solution that brings the power of digital learning to upper elementary mathematics. The program uses a combination of research-based visual models, story problems, classroom discussion guides, and real-world investigations to create an environment where both students and teachers thrive. Conceptua Math’s content and online tools ensure that students will be prepared for the rigor of the PARCC and SBAC Assessments.

ConsumerMath.org
Booth: 328
Bakersfield, CA
661-865-8518
www.consumermath.org
Our goal is to help students move from the classroom to real life through a virtual learning environment that allows students to get a job, pay bills, manage their bank accounts, and stay out of debt, all from the safety of the classroom. They gain the math skills they need to survive in the real world as they learn personal and business topics including: Calculating Wages, Budgeting, Interest, House Buying and Remodeling, Menu Conversions, Profit Margins, Taxes, Probability, and much more!

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CPM Educational Program
Booth: 210
Elk Grove, CA
209-745-2055
www.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 (© 2013) is 100% aligned with CCSS content and practices. High school books offer both traditional and integrated pathways.

CueThink
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North Reading, MA
781-640-0526
www.cuethink.com
CueThink is an iPad application for grades 4-12 that empowers learners to see problem solving challenges as opportunities. It scaffolds Polya’s 4 phases of Understand, Plan, Solve and Review and then layers in peer annotations for intelligent feedback. CueThink’s unique approach captures both individual and collective thinking and ensures that students are fully engaged in the CCSS Mathematical Practices. With CueThink, you can #makemathsocial.

Curriculum Associates, Inc.
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Desmos, Inc.
Booth: 220
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Didax Inc
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800-458-0024
www.didax.com
Didax publishes supplemental resources for grades PreK-12, including books, games, interactive resources, manipulatives, and more. In addition, we partner with Math Perspectives to distribute Kathy Richardson’s assessment and curriculum materials. Our materials provide teachers with innovative, hands-on ways to help students achieve the goals of the Common Core State Standards.

Digi-Block
Booth: 547
Cambridge, MA
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www.digi-block.com
Digi-Block is a research-based system that allows students to discover number-sense for themselves. Before addressing the abstract and technical aspects of arithmetic operations (symbols, language, regrouping, etc.), students discover for themselves the meaning of numbers and digits through the blocks and “smart box” system. Once students discover and internalize how numbers work, they naturally pair their hands-on understanding with the conventional, abstract understanding of arithmetic.

Dinah-Might Adventures, LP
Booth: 1215
San Antonio, TX
210-698-0123
www.dinah.com
Dinah-Might Adventures is an educational publishing and consulting company owned by Dinah Zike, Author/Speaker. Her books are known for their innovative ways to use “Foldables” in teaching all subjects and grade levels. She also offers professional development at the Dinah Zike Academy, a unique trainer of trainers facility in Texas.

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www.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.

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Washington, D.C.
844-853-1010
www.eureka-math.org
Eureka Math was built after the creation of the new standards, when a group of teachers came together to create a totally new, powerful preK – 12 curriculum. Eureka wasn’t retrofitted to meet the new standards, it was born from them. So the standards are seamlessly integrated, not shoved into old textbooks. Created by a non-profit, Eureka offers basic curriculum at no charge along with customizable solutions to fit your needs. Learn more at eureka-math.org or call 844-853-1010.

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The HITN Early Learning Collaborative, designs, develops and disseminates research-based transmedia materials for 3 and 4-year-olds, teachers and families. The English Language Development, Early Literacy and Early Math materials help ensure all enter kindergarten ready to succeed in school and beyond. These learning resources build academic skills, support language development, promote collaboration and self-regulation, and provide families with engaging at home activities.

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It’s About Time believes that students learn math and science the way that practicing scientists and mathematicians do. They learn when something grabs their attention...when the content is relevant to their lives. They learn when we allow them, in fact encourage them, to talk to one another and question each other’s results. They learn when we permit them to get their hands on the subject matter. In short, when we allow students to use all of their senses, they make sense of math and science.

IXL Learning
Booth: 820
San Mateo, CA
855-255-8800
www.ixl.com
IXL is a math practice website for K-12 aligned to state standards and the Common Core. IXL offers unlimited questions in a fun, dynamic format that students love. Plus, teachers can view detailed reports on students’ progress and trouble spots—including complete question histories for individuals.

J
Jump Math
Booth: 309
Toronto, ON, Canada
510-677-0001
www.jumpmath.org
JUMP Math is a non-profit organization dedicated to closing the math achievement gap in children grades 1 to 8. Through its classroom curriculum (which has been carefully rewritten to adhere to the common core standards), JUMP helps teachers guide discovery in their students which leads to deeper problem solving skills.
KnowRe believes in the importance of a good goal. The most effective tool to help bring about these educational system and that technology is the education, the need for personalization in our areas and engages students through gamified personalizes a curriculum for each student’s focus on an individual’s strengths and weaknesses, per- solution for mathematics. KnowRe assesses what a student knows, Knewton recommends what to study next, helping more students mas- use Knewton technology to power course ma- tion and elevate classroom achievement.

Knewton
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New York, NY
212-563-9866
www.knewton.com
Knewton’s goal is to personalize lessons for students around the world. Education companies use Knewton technology to power course ma- terials that dynamically adapt to each student’s unique needs. By analyzing data to figure out what a student knows, Knewton recommends what to study next, helping more students master material and get ahead. Knewton-powered analytics identify knowledge gaps and predict performance to help educators, parents, and administrators better support every student.

KnowRe
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New York, NY
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KnowRe is an innovative adaptive learning solution for mathematics. KnowRe assesses an individual’s strengths and weaknesses, personalizes a curriculum for each student’s focus areas and engages students through gamified features, attractive graphics and social learning. KnowRe believes in the importance of a good education, the need for personalization in our educational system and that technology is the most effective tool to help bring about these goals.

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Carson, CA
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Mastery Educational Service (Mastery Ed), authorized representative for Teach 4 Mastery & Math-U-See product lines and services. Specializing in RTI Tier 2 and 3 math interventions that meet the Common Core Math Practice Standards and help close the achievement gap. For a full demo and info visit us at Booth 1240 or www.MasteryEd.com or call us at 800-454-6284.

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At Math for America (MfA), we do everything we can to make teaching a viable, rewarding, and respected career choice for the best minds in science and mathematics. With over 1,000 teachers in our fellowship programs, MfA rewards and supports new and experienced mathematics and science teachers through four fellowships.

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Westbury, NY
516-333-0717
www.mathmattersinc.com
Math Matters, Inc. was established in 1998, and publishes a monthly journal of games and puzzles for elementary and middle school teachers. In addition, the company offers seminars, workshops and courses in math education throughout the United States. Books, kits, and math resource materials are available for elementary, middle and high school teachers of mathematics. For a full listing of services and resources visit our website at: www.mathmattersinc.com

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— Excerpt from Gates annual letter 2012.
Exhibitor Directory

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202-803-7919
www.maa.org
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Mathematical Olympiads for Elementary & Middle Schools
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Belmore, NY
516-781-2400
www.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 non-routine problems. Certificates, medals or trophies are awarded to all participants. Visit our booth for information, sample problems and prizes.

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Ubiratan D’Ambrosio & others coined “Ethnomathematics” to describe math practices of identifiable cultural groups. More broadly, it can refer to those of larger groups and of small sects. Mathematical practices include symbolic systems, spatial designs, practical construction techniques, algorithms, measurement, ways of reasoning, etc. for which formal representation is possible. NASGEm & EONAS promote culturally responsive math education practices.

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Did you know? As a member of NCTM, you have access to grants and awards to enhance your mathematics teaching and learning. The Mathematics Education Trust (MET) provides funding opportunities to focus on classroom action research, projects that engage students in learning mathematics, professional development, and graduate study to improve teaching skills and classroom practice.

Begin your search at www.nctm.org/met, where you will find current grants and awards grouped by grades pre-K–5, 6–8, 9–12, and more. Click on any title to see a description of the award or grant, comments from a previous awardee, and eligibility and proposal requirements. The following are examples of MET awards:

- **Future Leaders Initial NCTM Annual Meeting Attendance Awards:** Grants of up to $1,200 plus meeting registration provide for travel, subsistence expenses, and substitute teacher costs of members who are classroom teachers and have never attended an NCTM annual meeting.

- **School In-Service Training Grants:** Elementary, middle, or high schools receive up to $4,000 for support of in-service mathematics programs.

- **Mathematics Coursework Scholarships:** Scholarships of up to $2,000 are awarded to classroom teachers working to pursue courses to improve their mathematics content knowledge.

- **Pre-K–6 Classroom Research Grants:** Awards of up to $6,000 support collaborative classroom-based action research in precollege mathematics education involving college or university mathematics educators.

- **Engaging Students in Learning Mathematics Grants:** Awards of up to $3,000 are given to grades 6–8 classroom teachers to incorporate creative use of materials to actively engage students in tasks and experiences designed to deepen and connect their mathematics content knowledge.

- **Connecting Mathematics to Other Subject Area Grants:** Awards of up to $4,000 are awarded to grades 9–12 classroom teachers to develop classroom materials or lessons connecting mathematics to other disciplines or careers.

A proposal to the Mathematics Education Trust is typically no longer than five pages. Two deadlines occur per year: the first week of May and the first week of November. The MET Board of Trustees reads proposals and notifies awardees by letter in July and February.

The MET Board of Trustees strives to distribute all awards in each funding cycle. Some funds go unused because applications are not received for all grants each year. Take advantage of this opportunity to obtain funding for you or your school. Visit the website on a regular basis to check for updates.

The MET also accepts donations and is always looking to establish new grants and awards. MET is an asset of NCTM and can be an asset for you.
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The journal editors from *Teaching Children Mathematics*, *Mathematics Teaching in the Middle School*, and *Mathematics Teacher* will be giving a series of mini-sessions to help you write or referee for one of NCTM’s school journals. Inside of 15 minutes, you’ll discover how to submit your ideas for publication, volunteer as a referee, or polish an existing manuscript. The editors will explain the peer-review process, answer your questions, point you in the right direction, and allay any fears you may have about getting started. All for a price that can’t be beat—free!

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10:30–10:45 a.m. and 1:30–1:45 p.m.

**Friday, April 17:**
10:30–10:45 a.m. and 1:30–1:45 p.m.

**Saturday, April 18:**
10:30–10:45 a.m.

**Be a Journal Referee**
Find out how critiquing manuscripts can help your career.
*Presented by Tara Slesar,*
*MT editor*

**Thursday, April 16:**
11:30–11:45 a.m. and 2:00–2:15 p.m.

**Friday, April 17:**
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**Saturday, April 18:**
11:00–11:15 a.m.

**Avoid Writing Pitfalls**
Learn hints on steering clear of those pesky manuscript potholes.
*Presented by Beth Skipper,*
*TCM editor*

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**Friday, April 17:**
1:00–1:15 p.m. and 2:30–2:45 p.m.

**Saturday, April 18:**
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Where:
HP Booth, 1209

When:
Thursday: 10:00am and 2:00pm
Friday: 11:00am and 3:00pm
Saturday: 10:00am

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Visit us at Booth 942 and learn more about all of the hands-on lessons and math enhancement activities. The Actuarial Foundation offers to middle and high school teachers.

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NCTM Annual Meeting & Exposition
April 15–18 - Boston
Complete the following information to be added to Exemplars newsletter, where you’ll receive other useful tips and resources.

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School: ______________________________
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Email address

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Signature

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Day of the Week Time
Day of the Week Time

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