National Council of Teachers of Mathematics
2013 Annual Meeting and Exposition
Denver, Colorado
April 17-20, 2013

Tech-related Sessions

Are you a speaker? Want to update your listing?
Contact: ihor@clime.org and he will update with your photo, links etc.
Work in progress. Edited: *4/9/13 6:10pm*

Highlighted Sessions

Session 5 - *Thursday, April 18, 8:00am-9:00am*
Chaos Games and Fractal Images
8:00 AM-9:00 AM

 Speaker: Bob Devaney	See how to incorporate some interesting topics in contemporary mathematics, such as chaos and fractals, into the grades 6–12 curriculum. I give this session twice each year during the Math Field Days in Boston. Grade Band Audience: General Interest/All Audiences Attribute: President's Series Presentation Room: 108 (Convention Center) Link to further information: http://math.bu.edu/people/bob

46 - *Thursday, April 18, 8:00am-9:15am*
Collecting Live Data in Fathom
Speakers: Tyler Pulis, Blake Whitley and Hollylynne Lee
Experience the journey that the students at Lakeside Middle School have been on for the past two years. Explore mathematics with the graphing calculator, covering topics ranging from fractions to growth rates to investigating rates of change. Take away classroom-tested activities that will put student thinking first.
6-8 Gallery Workshop
Grade Band Audience: *6 to 8* | 110/112 (Convention Center)

80 - *Thursday, April 18, 9:30am-9:15am*
The Mathematics of Angry Birds
Speakers: John J Diehl and Ismael Zamora
We will use the popular game "**Angry Birds**" as motivation for explorations of projectile motion, focusing on parametric relations to develop a model for motion. The exploration will study how the variables of angle and initial velocity affect the graph, the motion, and the game. We'll check the results for motion in other images and **video captures**.
Grade Band Audience: Higher Education, 9 to 12 | 601 (Convention Center)

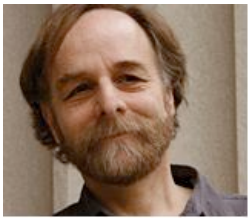
Session 124 - *Thursday, April 18, 11:00am-12:00pm*
Learning about Student Understanding with the "Show Me" iPad App
Speakers: Jenny Jorgensen
Students' attention to precision, engagement level, and perseverance have increased with the use of **iPads**. I will share what I have learned about students' mathematical understanding during response to intervention instruction. We will discuss students' recordings using the Show Me app and what can be learned from them.
Grade Band Audience: *6 to 8, 3 to 5*
Room: 203 (Convention Center)

Link to further information: https://sites.google.com/a/yarmouthschools.org/i-m-convinced-through-the-show-me-app/jenny-jorgensen

Session 133 - *Thursday, April 18, 11:00am-12:00pm*
Calculus Animations with GeoGebra

 Speaker: Kevin W Hopkins	**GeoGebra** is a free, **Web-based** software that does dynamic geometry and graphing. The dynamic feature of the software allows for animations that can illustrate many topics in calculus. I will show some animations I have used as well as feature some instruction on how to create animations that the audience suggests. Grade Band Audience: Higher Education, 9 to 12 Room: Mile High 4 A/B (Convention Center) Link to further information: https://sites.google.com/site/collegealgebraworksheets/calculus-i-illustrations

180 - *Thursday, April 18, 12:30pm-1:30pm*
Getting Serious about Games in Middle Grades Math

 Speaker: Scot Osterweil	Play a little, learn a little. Presenters share findings from a national math challenge featuring **Lure of the Labyrinth**, an **online game** where students navigate a graphic novel by using mathematical thinking. Participate in group game play and learn what impact the game had on more than 10,000 middle grades students and their teachers. Grade Band Audience: *6 to 8* | Centennial Ballroom D (Hyatt Regency) Link to further information: Lure of the Labyrinth

Session 207 - *Thursday, April 18, 2013: 1:00 PM-2:15 PM*
Do the Function Dance with Sketchpad 5

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 of geometric, linear, quadratic, exponential, and composite functions. Bring your laptop or iPad with Sketchpad. Leave with classroom-ready activities suitable for geometry and algebra.

Grade Band Audience: *9 to 12, 6 to 8* | 708/710/712 (Convention Center)

Link to further information:
http://dynamicgeometry.com

Speakers:
Scott Steketee & Daniel Scher

Session 476 - *Friday, April 19, 2013: 12:30 PM-1:30 PM*
Help Students Understand Slope and Graphs with Free Smartgraphs Software
Speakers: Andrew A Zucker and Carolyn Staudt
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 2 C (Convention Center)

SmartGraphs helps students understand the meaning of graphs and concepts represented in graphs (velocity, global warming, etc.). It's free and because it's written in HTML5 it runs in a web browser without Java or Flash. There is an authoring system so teachers or others can create their own multi-page SmartGraphs activities (or use those already available). Hints and scaffolding help students if they answer questions incorrectly. Students' responses can include clicking a point on a graph, entering a numeric answer, constructing a line, etc.
Here's an activity that focuses on the speed of a car as represented in several position-time graphs:
http://smartgraphs-authoring.concord.org/activities/19-driving-to-grandma-s-house/student_preview
And here's one focusing on the classic comparison of two cell phone plans (each a linear function): http://smartgraphs-authoring.concord.org/activities/150-cell-phone-plans/student_preview

Link to further information:
http://clime.org/2013/476-Zucker-SmartGraphs-NCTM-2013.pdf

Thursday, April 18, 2013

6

Math Lessons from Research

Speakers: *Douglas H. Clements and Julie Sarama*

Math education is in a state of dramatic change. What does the research say that offers reliable guidance to using new standards such as the Common Core, new curricula, and new teaching strategies? Discuss lessons from recent research. At the core of many successful efforts are learning trajectories: research-based paths of learning and teaching.

Grade Band Audience: General Interest/All Audiences

Capitol Ballroom 4 (Hyatt Regency) | 8:00 AM-9:00 AM

15

Developing Proportional Reasoning by Using Manipulatives

Speaker: *Kevin Dykema*

Do your students need hands-on activities to help develop their understanding of unit rates, proportional reasoning, and slope? Discover the benefits of using **virtual** and hands-on manipulatives to help your students better understand these important topics, and see some examples of how to use various manipulatives to teach these concepts.

Grade Band Audience: *6 to 8*

709/711 (Convention Center) | 8:00 AM-9:00 AM

16

Influencing Student Reasoning with Tables and Graphs by Using Technology

Speakers: *Judith Olson and Brendan Brennan*

Explore research related to reasoning and proof and proportional relationships, and examine classroom actions that show how a classroom community uses valid arguments to justify mathematical claims for finding the next term and the *n*th term in a table of values.

Grade Band Audience: *6 to 8 Research Session | 205 (Convention Center) | 8:00-9:00AM*

18

Assessing Common Core Standards for Mathematical Practice: Challenges and Opportunities

Speakers: *Luis E Saldivia and Elida Wylie*

Assessing mathematical practices can be challenging. What content knowledge best aligns with each of the practice standards? What kinds of **technology** best allow students to interact with the practices? What kinds of scenarios engage students? The speakers will share their experiences developing innovative tasks for assessing mathematical practices.

Grade Band Audience: *9 to 12, 6 to 8*

703 (Convention Center) | 8:00 AM-9:00 AM

21

Picture Yourself Having Fun at Math

Speaker: Mary A. Robertson

Use **photography** to incorporate real-world situations into your mathematics classroom. Use pictures to reinforce concepts involving geometric shapes, areas, volumes, similar objects, and transions, as well as reinforce conic sections, the Pythagorean theorem, slope, and much more. You'll get a **CD** containing ready-to-use examples.

Grade Band Audience: *9 to 12, 6 to 8 | Mile High 3 B (Convention Center)*

8:00 AM-9:00 AM

22

Teaching Mathematics with a Tablet PC

Speaker: Suzanne Lewis

Using a **tablet PC** can bring to life proof and understanding of key mathematical concepts. Students use programs such as **FluidMath** (Brown University), **Excel**, **Microsoft OneNote Notebooks**, **DyKnow (Dynamic Knowledge**), Community Clips (**videos**), and **e-textbooks**, all on their **tablet PC**s, to explore concepts and create their own understanding of algebra.

Grade Band Audience: *6 to 8, 9 to 12* | 702 (Convention Center)

8:00 AM-9:00 AM

23

How Many to Order? Applying the Economic Order Quotient

Speakers: Thomas G. Edwards, Kenneth R. Chelst and S. Asli Ozgun-Koca

Learn to use the Economic Order Quantity, a management tool, to decide how much of a product to carry in stock to minimize ordering and holding costs. Use **technology** and algebra to solve a specific example of the problem and generalize the result. We will share open-ended questions for launching the activity.

Grade Band Audience: *9 to 12* | *501/502 (Convention Center)*

8:00 AM-9:00 AM

25

The Math behind the Heavens and the Earth

Speaker: *Gary M Rubinstein*

Galileo once wrote, "Mathematics is the language with which God has written the universe." Humanity's desire to understand the cosmos drove much of the development of math. Learn how astronomers from Thales to Newton used, or invented, many topics from high school math to **virtually** explore the heavens.

Grade Band Audience: *9 to 12* | *Centennial Ballroom F (Hyatt Regency)* | *8:00-9:00am*

26

Transform Triangle Congruence and Similarity by Using Core Math Tools

Speaker: *Brin Keller*

Experience resources for reasoning and proving triangle congruence and similarity conditions by using transions and coordinate models. Examine how Common Core mathematical practices and geometry standards can be implemented using **Core Math Tools**, mathematical **software** for teachers and students, freely available at www.nctm.org/coremathtools.

Grade Band Audience: *9 to 12* | *605 (Convention Center)*

8:00 AM-9:00 AM

27

Following Beginning Teachers' Experiences through Online Communities: Proof of Reflection

Speaker: Nina R. Girard

Explore how online support communities can help mentor and encourage beginning teachers to discuss and reflect on their classroom practice. I will share a scaffolded approach used to guide beginning teachers in dealing with classroom challenges, as well as actual posts showing reflection taking place.

Grade Band Audience: Preservice and Inservice, 9 to 12 | *405 (Convention Center)*

8:00 AM-9:00 AM

36

LEAP into SMART Notebook: Lessons, Explorations, Activities, Play

Speakers: Ginalouise Palermo, Alyse Jennifer Sciolla and Anna LaForgia

Are you using your **SMART Board** to its full potential? Learn to create games and lessons that enhance your teaching and address both Content and Process Standards. Explore gallery items and math tools, the recorder, an IPEVO camera, the screen capture tools, and basic functions of **SMART Notebook**. Leave with ideas and templates you can use on Monday.

Grade Band Audience: *6 to 8, 3 to 5* | *Four Seasons 4 (Convention Center)*

8:00-9:15am

44

Middle School Math: Turn It On

Speakers: Christi Fricks and Jennifer NorthMorris

Experience the journey that the students at Lakeside Middle School have been on for the past two years. Explore mathematics with the **graphing calculator**, covering topics ranging from fractions to growth rates to investigating rates of change. Take away classroom-tested activities that will put student thinking first.

Grade Band Audience: *6 to 8* | *403/404 (Convention Center)*

8:00-9:15am

46

Collecting Live Data in Fathom

Speakers: Tyler Pulis, Blake Whitley and Hollylynne Lee

Experience the journey that the students at Lakeside Middle School have been on for the past two years. Explore mathematics with the graphing calculator, covering topics ranging from fractions to growth rates to investigating rates of change. Take away classroom-tested activities that will put student thinking first.

6-8 Gallery Workshop

Grade Band Audience: *6 to 8* | 110/112 (Convention Center)

47
Coordinate Plane Transions: Have You Got the Right Image?
Speakers: Margaret Bambrick and Ruth Casey
Explore strategies that use manipulatives & the **TI-Nspire Navigator** to engage students in generalizing the pattern of sets of ordered pairs under various transions. After exploring the image of geometric figure, you will create a picture & its image under a variety of transions.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 3 A (Convention Center)

49
Carrots before Horses, a.k.a. Experience before Formalization
Speakers: Cindy M Percival and Jeffrey Marks
"Students need a chance to grapple with mathematical situations and discover key ideas for themselves. Experience–intuition–formalization: this is the sequence that leads to proof." This session will provide hands-on grappling experiences that will lead to intuition and finally to formalization. We will use **Nspire** and old-fashioned techniques.
Grade Band Audience: *9 to 12* | 111/113 (Convention Center)

51
Mind-On Projects Introducing Multiple Representations of Linear and Exponential Functions
Speaker: Jack L Jackson
Explore a classroom-tested, inquiry-based project introducing linear and exponential functions based on the Standards for Mathematical Practice from the Common Core. You will engage in the project and will get access to several more projects and resources. I will present a **Geometer's Sketchpad** file summarizing/illustrating key project ideas.
Grade Band Audience: *9 to 12* | Mile High 2 B (Convention Center)

54
Exploring Modular Arithmetic in Precalculus, Calculus, and Discrete Mathematics
Speaker: Jay L. Schiffman
Zeros and factors, end behavior, maxima/minima, asymptotes, and limits: these properties of polynomial and rational functions don't take a long time to teach when we use the **TI-Nspire CAS** handheld. Learn activities that avoid the pitfalls of student inaccuracies that keep students from getting the most of the learning goals of precalculus.
Grade Band Audience: 9 to 12, Preservice and Inservice | 607 (Convention Center)

57
Improving Student Understanding and Engagement with Technology
Speakers: Mayim Bialik and Tom Reardon
Join Emmy-nominated actress, teacher, and real-life neuroscientist Mayim Bialik and T3 instructor Tom Reardon as they show the power of math classroom technology—from prealgebra through calculus and statistics—by incorporating **TI-Nspire CX technology** and software into your lessons to bolster students' conceptual understanding of math.
Grade Band Audience: General Interest/All Audiences
Four Seasons 2/3 (Convention Center)

64
Meeting the Common Core's Math Fact Fluency Challenge
Speaker: Paul Cholmsky
Will your students be ready for **computer-based tests** that directly assess fact fluency via timed response items? This session summarizes the latest need-to-know research in math fact fluency and how it develops—or fails to develop—in elementary school students. I will present successful classroom techniques validated in large-sample studies.
Grade Band Audience: *3 to 5, PreK to 2* | Capitol Ballroom 4 (Hyatt Regency)

73
Fostering Discourse through Exploration with Technology
Speakers: Bob Horton and Leigh Haltiwanger
Classroom discourse is a key to developing deep understanding. With the right problems, exploring with **technology** can foster an environment filled with rich discussions and excited students. We will share two examples that can lead to dynamic discussions, engage your students, and develop their knowledge of big ideas.
Grade Band Audience: *6 to 8, 9 to 12* | Mile High 3 B (Convention Center)

75
***Moneyball* in the Classroom: Using Baseball to Teach Statistics**
Speaker: Josh Tabor
As illustrated in the movie *Moneyball*, understanding the power of statistical analysis can be rewarding. Using a formula from the **movie**, we will learn how to make predictions, calculate residuals, and develop the concept of least squares. We will also use activities to explore regression to the mean and least-squares regression lines.
Grade Band Audience: *9 to 12* | Capitol Ballroom 1-3 (Hyatt Regency)

77
I See It: The Power of Visualization
Speaker: Marc Garneau
What does it mean to "see" the math? Taking concepts that are typically taught only symbolically, we'll explore tasks that can engage students to reason and to make sense of mathematical concepts through visual representations. The nature of these tasks will include concrete patterning, **dynamic graphing**, geometric representation, and more.
Grade Band Audience: *9 to 12* | 505 (Convention Center)

79
Forensic Photography: CSI for the Eccentric(ity)
Speaker: Mike Reiners
Our brain convinces us from experience that a round conference table observed from a distance actually has a circular tabletop. However, in a 2-D photograph taken from that perspective, the perimeter looks elliptical. Finally, a practical use of eccentricity. Learn to **use photos forensically** to deduce camera angles, lengths, and distances.
Grade Band Audience: Higher Education, 9 to 12
702 (Convention Center)

80
The Mathematics of Angry Birds
Speakers: John J Diehl and Ismael Zamora
We will use the popular game "**Angry Birds**" as motivation for explorations of projectile motion, focusing on parametric relations to develop a model for motion. The exploration will study how the variables of angle and initial velocity affect the graph, the motion, and the game. We'll check the results for motion in other images and **video captures**.
Grade Band Audience: Higher Education, 9 to 12 | 601 (Convention Center)

81
A Research-Based Learning Progression for Beginning Algebra
Speaker: Nicole L. Fonger
A learning progression from equivalent expressions to solving linear equations was designed on the basis of research literature and later tested in a ninth-grade classroom. Explore research-based tasks, techniques, and theories to support students' change in representational fluency using **CAS** and paper and pencil as tools.
Grade Band: Preservice/Inservice, 9 to 12 | 102 (Convention Center) | 9:30-1030am

83
Using Smartpens to Enhance Student Reasoning in a Proofs Course
Speakers: Dan Radelet and Francisco Alarcon
Smartpens record students' thought processes as they work through proofs. Instructors use the saved pencasts to gain insight into student reasoning and make corrections if necessary. Such an approach is not possible with finished written work.
Grade Band Audience: Preservice and Inservice, Higher Education | 709/711 (Convention Center)

93
Crush Fractions with Technology: Show Me and I Get It
Speakers: Peter S Price
Technology affords us ways to represent fractions that supplement other resources and other modes of teaching, including hands-on fraction models, pictorial representations, and symbolic number work. You will take away free printed manipulatives and resources to reinvigorate your teaching of fractions.
Grade Band Audience: Preservice and Inservice, 3 to 5 | 708/710/712 (Convention Center)

95
Connecting Fractions, Measurement, and Number Lines with Manipulatives and Technology
Speakers: Nicholas J. Gilbertson, D. Lee Clark and Jia He
Use hands-on manipulatives and **technology** to build meaning for fractions and the number line from length measurement, addressing the Common Core's treatment of these topics. We will also address research on student understanding about length measurement and number lines.
Grade Band Audience: *6 to 8, 3 to 5* | 403/404 (Convention Center)

106
Verify It: Using Technology Models
Speakers: Kathleen McKinley and Alwina Green
We will share how you can use **technology** to give access to struggling and English language learner students, as well as enhance and extend content for the mathematically savvy student. Create simulations and geometric models to represent real-world activities such as skateboarding. Represent generated data algebraically. Make connections between symbols and quantities.
Grade Band Audience: *9 to 12, 6 to 8* | 704/706 (Convention Center)

109
Exploring AP Calculus with Colorful Calculator Investigations
Speakers: Sondra Dempsey and Deedee Stanfield
Explore activities involving limits, derivatives, and integrals through engaging hands-on activities and graphing calculators with enhanced color graphics. We will also use data collection devices as related to calculus topics.
Grade Band Audience: *9 to 12* | Centennial Ballroom A (Hyatt Regency)

110
How Do You Use Statistical Reasoning to Formulate Convincing Conclusions?
Speakers: Beth E. Ritsema and Alden J. Edson
Engage in problem-based, student-centered tasks that exemplify Common Core Standards. Using participant-collected data, we will use simulations and graphical displays to help decide whether differences between treatment means are significant. Bring your own laptop to use the free apps in Core Math Tools, available at the NCTM website.
Grade Band: *9 to 12* | Four Seasons 4 (Convention Center) 11:00-12:00pm

116
Teaching Mathematics to English Language Learners: Going Beyond Good Teaching
Speaker: Nora Ramirez
What strategies must we use to ensure that English language learners (ELLs) have access to high-quality mathematics and the opportunity to develop necessary mathematical practices and language? I will use video clips and cases to highlight K–12 strategies and instructional tools that are effective in teaching ELLs at the various stages of language development.
Grade Band Audience: General Interest/All Audiences
Capitol Ballroom 4 (Hyatt Regency)

120
Classroom Norms to Support Student Reasoning and Proof
Speakers: Michele Heron and Lisa Host
Learn how one fourth-grade teacher creates classroom norms that promote student-centered reasoning and proof. The presentation will include **video examples** of student interactions, insights from the classroom teacher, and a handout offering suggestions for teachers wanting to create similar settings for their own students.
Grade Band Audience: *3 to 5* | 107/109 (Convention Center)

124
Learning about Student Understanding with the "Show Me" iPad App
Speakers: Jenny Jorgensen
Students' attention to precision, engagement level, and perseverance have increased with the use of **iPads**. I will share what I have learned about students' mathematical understanding during response to intervention instruction. We will discuss students' recordings using the Show Me app and what can be learned from them.
Grade Band Audience: *6 to 8, 3 to 5*
203 (Convention Center)

125
Lesson Learning from Interviews about Numerical Reasoning
Speaker: Marilyn Burns
Learning to reason numerically is essential for students' success with math. Learn about the specific strategies and understandings essential for numerical proficiency. **Videotapes** of student interviews illustrate the importance of emphasizing reasoning mentally.
Grade Band Audience: 3 to 5, 6 to 8 | Four Seasons 2/3 (Convention Center)

128
Pattern Block Frenzy: Proportional Reasoning with Technology
Speaker: Katie L. Anderson
Students often struggle with making sense of ratios and proportions. Learn how a group of sixth graders used virtual pattern blocks to develop proportional reasoning. Their work reveals a variety of creative solutions made possible by the dynamic nature of **virtual manipulatives**, worthwhile mathematical tasks, and rich classroom discussions.
Grade Band Audience: *6 to 8* | 108 (Convention Center)

130
Exploring Students' Readiness to Learn Slope
Speakers: Angela Broaddus and Susan Gay
Our formative assessment instrument was developed to be sensitive to common misconceptions about covariation and proportional reasoning that affect students' readiness to understand slope. We will share aspects of the assessment, our findings, and suggested activities to help you address these misconceptions.
Grade Band Audience: *9 to 12, 6 to 8* | Centennial Ballroom F (Hyatt Regency)

131
How Do We Know What We Think We Know?
Speakers: Kurt Mederer, Joel Padilla and Andrew M Byrne
How much evidence do we require to believe a statement? How sure do we need to be to act on information? What role does time pressure play in our decision? We will explore different situations and consider the role of proofs, the **Internet**, and **technology**.
Grade Band Audience: *9 to 12* | 405 (Convention Center)

133
Calculus Animations with GeoGebra
Speaker: Kevin W Hopkins
GeoGebra is a free, **Web-based** software that does dynamic geometry and graphing. The dynamic feature of the software allows for animations that can illustrate many topics in calculus. I will show some animations I have used as well as feature some instruction on how to create animations that the audience suggests.
Grade Band Audience: Higher Education, 9 to 12
Room: Mile High 4 A/B (Convention Center)
Link to further information:
https://sites.google.com/site/collegealgebraworksheets/calculus-i-illustrations

134
Calculus In Motion: Improving Calculus Understanding through Interactive Computer Animations
Speaker: Audrey M Weeks
Explore interactive **computer animations** (**Sketchpad**) that bring calculus to life as the study of motion and change. When you pair animations with a reasoning–questioning teaching strategy, understanding soars because all students see it with their own eyes. Topics include limits, derivatives, integrals, related rates, volumes, and more.
Grade Band Audience: 9 to 12, Higher Education | Mineral Hall F/G (Hyatt Regency)

141
Learning Online and Outdoors: Integrating Geocaching into the Mathematics Classroom
Speakers: Lucy Bush and Jeffrey Hall
Geocaching is a high-tech treasure hunt with many opportunities for mathematics education. From geospatial awareness to decryption, students use a variety of mathematical skills to find hidden treasures in the great outdoors. Alternatively, MathCaching websites award virtual treasures on the basis of content-specific capabilities. (See 3 page article - pages 20-22). *Burst Session*
Grade Band Audience: General Interest/All Audiences | Mile High 1 E/F (Convention Center)

143
PLC: The Practices, the Lessons, the Collaborative
Speakers: Hope M Yursa and Jason Silverman
Learn how you can bring the mathematical practices to life while crafting research lessons as a member of our **online lesson study collaborative**. This PLC values teachers as professionals and offers intellectually stimulating opportunities to increase math knowledge for teaching with a focus on student understanding
Grade Band Audience: General Interest/All Audiences | Mineral Hall A-C (Hyatt Regency)

144
Spreadsheet Simulations and Modeling Used as Proof
Speaker: John K Ley
We will examine using **spreadsheets** as a model to prove. We will investigate various probability aspects and misconceptions by using spreadsheets, with reference to the Birthday problem and its extensions, the Monty Hall scenario, and other practical probability scenarios. These spreadsheet applications are in a user-friendly. *6-8 Burst Session*
Grade Band: General Interest/All Audiences | Centennial Ballroom G/H (Hyatt Regency)

145
Can Primary Students Really Defend Their Work in Mathematics? Yes.
Speaker: Jean Morrow
Learn three successful ways that young children can “argue” and “defend” their solutions to problems. These ways include number talks, pictures, and games. I will share student work, video, and students engaged in defending their work. *Burst Session*
Grade Band Audience: *PreK to 2* | Mile High 2 B (Convention Center)

152
Walking, Talking, Seeing, and Doing Math: A University Math Trail
Speaker: Christine L. Latulippe
Explore using a math trail at a university campus as a way to encourage preservice elementary teachers to consider math outside the classroom. Try a few questions from a "virtual" form of the math trail and gain insight into how this activity was designed and used in an elementary methods course. *Burst Session*
Grade Band Audience: 3 to 5, Preservice and Inservice | 603 (Convention Center)

157
Math Journal 2.0: Jump-Start Your Students' Reflections
Speaker: John Schnatterly
Reflection is a vital component of student learning. Have your students leave the journal notebook behind and reflect in an online blog. One hundred students in a small school in East Harlem blogged twice weekly for five months and saw a dramatic improvement in retention and test scores. Learn what you need to start math blogs now.
Burst Session
Grade Band Audience: *9 to 12* | 103/105 (Convention Center)

159
A New "Sage" on the Stage
Speaker: Joe A. Stickles
Sage is a powerful **computer algebra system** available as a free download. Discuss activities you can use in a variety of classes, such as algebra, trigonometry, calculus, and discrete mathematics. I will also share examples of projects that you can enact in these and more advanced courses.
Burst Session
Grade Band Audience: Higher Education, 9 to 12 | 403/404 (Convention Center)

161
Concept Mapping in Probability and Statistics
Speaker: Alisa S Izumi
Teachers or researchers can develop their own assessment instruments by using Inspiration 6, a **computerized visual learning tool** that inspires students to develop and organize their ideas. The computerized constructions provide the interface upon which students and teachers together can construct probability and statistics models and methods.*Burst Session*
Grade Band Audience: *Higher Education* | 104/106 (Convention Center)

162
Connecting Undergraduate Content to Practice
Speaker: Janet A. White
"When are we ever going to use this?" is not just a question for K–12 mathematics. Future mathematics teachers often ask their undergraduate professors the same thing. I will briefly describe a majors-based freshman learning community and the ongoing connections made using a content portfolio assignment.
Burst Session
Grade Band Audience: *Higher Education* **|** Mineral Hall D/E (Hyatt Regency)

180
Getting Serious about Games in Middle Grades Math
Speaker: Scot Osterweil
Play a little, learn a little. Presenters share findings from a national math challenge featuring **Lure of the Labyrinth**, an **online game** where students navigate a graphic novel by using mathematical thinking. Participate in group game play and learn what impact the game had on more than 10,000 middle grades students and their teachers.
Grade Band Audience: *6 to 8* | Centennial Ballroom D (Hyatt Regency)

184
Keeping It Real: Teaching Math through Real-World Topics
Speaker: Karim Kai Ani
How long does burning off a Big Mac take? In basketball, should you ever foul at the buzzer? Explore real-world lessons that teachers can immediately use to address the Common Core State Standards in a fresh, new way. Learn to foster a rigorous understanding of math while challenging students to think about the world more critically.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 1 C/D (Convention Center)

186
Reimagining High School Geometry
Speakers: John Threlkeld and Pete Horsch
Geometry remains a vital mathematical experience. Our access to 21st-century resources and thinking means, however, that it must change. We will challenge your conception and share ours of a more active, exciting geometry course including elements of design thinking, an expansive attitude toward proof, and more emphasis on real problem solving.
9-12 Session
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 4 A/B (Convention Center)

187
How and Why: Use Graphing Calculators for Reasoning and Proof
Speaker: Kathleen Cage Mittag
Graphing calculators have not been extensively used for reasoning and proof. Explore algebra 1, algebra 2, and geometry Common Core–based reasoning and proof problems. Then we will discuss why and how to use the graphing calculator. The problems will come

from various NCTM publications and from Common Core sample assessment problems.
Grade Band Audience: *9 to 12* | 505 (Convention Center)

194
Engaging Prospective Teachers in Generating Conjectures That Call for Proof
Speaker: M. Kathleen Heid
Engaging prospective secondary mathematics teachers (PSMTs) in reasoning and proof starts with their generating and testing their own conjectures. Everyday classroom situations and experimentation with **technology** can serve as venues for these conjectures, as seen in our work with PSMTs. We will discuss characteristics of promising situations.
Grade Band Audience: Preservice and Inservice | 601 (Convention Center)

205
TI-Nspired for the Middle Grades: Common Core–Based Investigations
Speaker: Ann M Schlemper
Engage in several **TI-Nspire activities** designed for middle grades students to explore the Common Core State Standards for Mathematics. Explorations will relate to geometry and functions. These activities are part of the Math Nspired resources on education.ti.com.
Grade Band: Preservice and Inservice, 6 to 8 | Capitol Ballroom 5-7 (Hyatt Regency)
1:00 PM-2:15 PM

206
Algebra Reasoning, Common Core Standards, English-Language Learners: Analyzing Motion Graphs
Speakers: Angela Thompson and Alex Radosavljevic
We will use **calculator-based rangers** to create motion graphs that support English language learners in making connections between motion in 3-D space and how that is displayed on a distance–time graph. We will work with linear equations, domain/range, independent/dependent variables, intersecting lines, slope, parallel and perpendicular lines, and more.
Grade Band Audience: *9 to 12, 6 to 8* | 506/507 (Convention Center)

207
Do the Function Dance with Sketchpad 5
Speakers: Scott Steketee and Daniel Scher
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 of geometric, linear, quadratic, exponential, and composite functions. Bring your laptop or iPad with Sketchpad. Leave with classroom-ready activities suitable for geometry and algebra.
Grade Band Audience: *9 to 12, 6 to 8* | 708/710/712 (Convention Center)

211
Strike a Pose: Modeling in Algebra
Speakers: Jennifer M North Morris and Brenda Elmore
The pressure is higher than ever to include modeling in mathematics. Explore what linear and quadratic modeling looks like in the algebra curriculum. With minimal, inexpensive supplies, we will collect and analyze data and then use transions to fit student models, using photos and **technology.**
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 3 C (Convention Center)

215
Rocket into Quadratics
Patricia W Lytton
Explore **pre-engineering** project-based work for algebra to precalculus. Hands-on math: we will design, build, and launch paper rockets. This easy, low-cost, multiday project uses air pressure to creatively explore functions/modeling. Further discussion will include **CAD 3-D visualization**, balsa wood bridges, rollercoaster and catapult design, and robotics and bioengineering projects.
Grade Band Audience: *9 to 12* | 110/112 (Convention Center)

216
Teaching the Common Core Statistics Strand with the TI-Nspire
Sharon E. Bruce
Learn how to introduce your students to various Common Core statistical concepts with hands-on activities and then use the **TI-Nspire** to make the statistics come alive. We will explore (1) multiple graphs of different data types, (2) measures of center and spread, (3) probability simulations, and (4) sampling methods and distributions.
Grade Band Audience: *9 to 12* | 201 (Convention Center)

217
Fundamental Theorem of Calculus: Integration and Differentiation; Activities Using Technology
Speaker: Mike Koehler
Working through a series of paper–pencil and **TI-84 technology–based classroom activities**, you will experience hands-on investigations designed to help students improve their conceptual understanding of the fundamental theorem of calculus. Activities focus on connections between integral defined functions and the derivatives of these functions.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 104/106 (Convention Center)

222
Creating Higher-Achieving Math Students in the App Generation
Speakers: Gary G Bitter and Rusen Meylani
We are in an era when desktop and laptop computers are being replaced by smartphones and tablet computers. Explore the apps that can potentially increase student performance in high-stakes math tests based on the Common Core State Standards. We will share an up-to-date list of apps.
Grade Band Audience: General Interest/All Audiences | Capitol Ballroom 4 (Hyatt Regency)

224
Enhancing Mathematics Curricula and Instruction to Facilitate Students' Participation
Speaker: Kathryn B. Chval
Facilitating participation in mathematics classrooms is critical to student success. I will share how mathematics teachers learned to facilitate the participation of their students as they learned to use research-based strategies and **watched videos of their lessons filmed by their students wearing head-mounted video cameras**.
Grade Band Audience: General Interest/All Audiences | Mile High 1 C/D (Convention Center)

227
Teaching Mathematics through Problem Solving in the Common Core Classroom
Speakers: Melanie R Wenrick and Jean Behrend
Using **videos**, examine how elementary school children can engage in the mathematical practices as envisioned in the Common Core State Standards and NCTM's Process Standards. Learn how to use problem solving as the core of your curriculum to engage students in modeling, using tools, developing reasoning, and communicating effectively.
Grade Band Audience: *PreK to 2, 3 to 5* | 505 (Convention Center)

230
The Prime Online Stance: Teacher Inquiry and Response to Intervention
Speakers: Stephen J. Pape, Cynthia Griffin and Nancy Fichtman
Response to intervention is a framework including research-based instruction, progress monitoring, and data analysis for instructional decision making. Explore Prime Online, an online professional development program focusing on teacher inquiry for collecting data and making instructional decisions regarding student progress.
Grade Band Audience: Preservice and Inservice, 3 to 5 | 401/402 (Convention Center)

237
Proportional Reasoning: It's Much More than Cross-Multiplying
Speaker: Linda Jensen Sheffield
Proportional reasoning is a major focus and integrative theme of the middle grades Common Core State Standards. We will investigate activities from the free, online Scale City and the program Math Innovations that develop understanding of proportionality through reasoning and problem solving, not rote memorization of rules and definitions.
Grade Band Audience: *6 to 8* | 705/707 (Convention Center)

238
Teaching Rational Numbers to the iGeneration
Speaker: Eric Milou
Explore how to engage and motivate the teaching of rational numbers to the **iGeneration**. The Common Core has clearly placed a focus on the understanding of rational numbers, so this session offers you strategies, videos, and ive assessments that can lead to building better facility with rational numbers.
Grade Band Audience: *6 to 8* | Four Seasons 1 (Convention Center)

239
All CAS, All the Time: Three Schools' Journeys to Implementation
Speakers: Phil Gartner, Steve Viktora and P.J. Karafiol
Three different high schools adopted **CAS handhelds** across all math courses. Find out why and how we made the switch. We'll discuss issues of curriculum, teaching, finances, logistics, and public relations; we'll tell you what worked, what surprised us, and how we managed.
Grade Band Audience: *6 to 8, 9 to 12* | Mile High 4 E/F (Convention Center)

241
Preparing for the Common Core by Using a SMART Board
Speaker: Linda Treilman
Understanding is at the core. Use **SMART Board technology** to develop and deepen the understanding of important mathematical concepts. Create engaging, interactive lessons to build skills. **Dynamic graphing** programs tie concepts together. Add an individual response system for ive assessment to allow all students to participate.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 4 A/B (Convention Center)

242
Advanced Quantitative Reasoning: Meaningful Mathematics for High School Seniors
Speakers: Gregory D. Foley and Daniel A. Showalter
NCTM says, "Every student should study mathematics every year through high school, progressing to a more advanced level each year." This talk presents rich problems that seniors find engaging; that connect a wide range of mathematics, statistics, and modeling; and that leverage mathematical action **technologies** and classroom discourse.
Grade Band Audience: *9 to 12* | 205 (Convention Center)

246
Technology in Support of Proof
Speaker: Thomas Dick
Technology can provide a "conjecture generator," where we use its power to find mathematical patterns that might lead to the formulation of a conjecture. Proving such a conjecture is often viewed outside the use of technology. We will examine several examples where technology offers powerful hints to mathematical structure that aid in proof.
Grade Band Audience: Higher Education, 9 to 12 | 605 (Convention Center)

250
The Power of Ten: Framing Student Understanding
Speakers: Lisa Rogers and Amy Mayfield
This hands-on session uses ten frames as a valuable teaching tool you can incorporate in the classroom. We will address Mathematical Practices, emphasizing reasoning. We will explore a variety of activities, including basic, games, and open-ended problems. **Video clips** and student work will give you glimpses of how this could look in the classroom.
Grade Band Audience: *PreK to 2* | Mile High 1 A/B (Convention Center

252
Fact Fluency in Guided Math Classrooms: We Can Do It
Speakers: Kathy Spruiell, La"Donnis Perry and Nicole DiCarlo
"My students don't know their facts!" How often have you heard this? When do we fit it in? Explore strategies to seamlessly incorporate engaging, consistent, and conceptual fact fluency practice within guided math centers. Go deeper with guided math and give the centers a try for grades K–5. **Videos**, research, data, and tool kit provided.
Grade Band Audience: *PreK to 2, 3 to 5* | Mile High 2 B (Convention Center)

259
Rock with Scissors and Paper: Spatial Reasoning in Your Hands
Speakers: Sara Normington, Dr. Lynn Patterson and Jennifer Rising
Strengthen students' spatial reasoning and visual thinking through paper folding and cutting. Solve puzzles, create pop-ups, and engage students with activities that connect geometry and folk craft spanning centuries and cultures. Experiment with **iPad apps** to create equal and congruent shapes. Leave with classroom-ready materials.
Grade Band Audience: *6 to 8, 3 to 5* | 201 (Convention Center)

264
From Tiles to Equations: Algebraic Reasoning for All Learners
Speakers: Ruth Casey and Margaret Bambrick
Come see how to use manipulatives, motion detectors, **TI-Nspire handhelds**, Internet resources, software, and **TI-Navigator** to investigate patterns and relationships that lead to understanding of algebraic concepts. We will show ways to engage all learners by using manipulatives and technology for instruction and assessment.
Grade Band Audience: *9 to 12, 6 to 8* | 403/404 (Convention Center)

269
Creatively Integrating Multiple Technologies Using Color: iPads, SMART Boards, TI-Emulators
Speaker: Tom Reardon
Connect graph, table, equation, and words—interactively. Model equations on top of color photos. Cleverly use **TI-emulators** for the 84 and **Nspire CX**. Incorporate iPad apps in your classroom effortlessly. Use color to distinguish concepts and make mathematical connections. Get the free TI Document Player. Obtain more than two hundred classroom-ready activities.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 708/710/712 (Convention Center)

279
Math and Geography: Using Google Earth to Investigate Mathematics
Speakers: Hillary Wolfe and Karie Feldner Gladis
Google Earth is more than virtual field trips. See demonstration lessons on measurement, algebra, data analysis, geometry, and more, accessible through this free resource. Leave with engaging and real-world application lessons you can use immediately, for grades 1–8.
Grade Band: General Interest/All Audiences | Centennial Ballroom D (Hyatt Regency)

283
The Gamification of Math: Research, Gaming Theory, and Math Instruction
Speakers: Alex Sarlin and David Dockterman
This session draws on recent cognitive research to dissect and demonstrate the potential power (and pitfalls) of tapping gaming theory for math teaching and learning. What does it mean to leverage adaptive leveling, immediate feedback, transparent progress, and intriguing math tasks to build resiliency and conceptual and procedural fluency?
Grade Band Audience: General Interest/All Audiences | Mile High 4 E/F (Convention Center)

290
STEM Is Hot in Hot Springs
Speaker: Jennifer Luebeck
What do geothermal energy, melting ice, dentistry, disease, and flight have in common? All are core concepts in integrated science, technology, engineering, and mathematics (STEM) lessons developed by rural Montana teachers. Video, photos, and student work illustrate how multidisciplinary teams bring standards and STEM to life in the classroom.
Grade Band Audience: Preservice and Inservice, 6 to 8 | 405 (Convention Center)

292
Using Teacher- and Student-Made Videos in the Mathematics Classroom
Speakers: Janet B Andreasen, Deborah McGinley and Zyad Bawatneh
Fascinated by YouTube videos and Khan Academy? Wonder how people do that? Explore the use of software to create your own videos for student learning and assessment. The effective use of software for this purpose can help to differentiate instruction and reach diverse populations of students.
Grade Band Audience: *9 to 12, 6 to 8* | 601 (Convention Center)

293
Is That Always True?
Speaker: William Caroscio
By investigating geometric problems informally with interactive geometry software, students often asked, "Is that always true?" Motivating proof in this way engaged students in proving. I will share classroom examples and experiences.
Grade Band Audience: *9 to 12* | 709/711 (Convention Center)

296
Rainforests and Fast Food: Modeling Deforestation with a TI-Nspire
Speaker: Chris Henderson
Explore rainforest loss and America's love affair with fast food by using a TI-NSpire to model data and draw some interesting conclusions.
Grade Band Audience: *9 to 12* | Capitol Ballroom 4 (Hyatt Regency)

297
Real Math, Real Life: A Course for High School Students
Ron Larson
Explore a new type of high school **course available for free online**. The new course emphasizes the real-life applications of mathematics and requires no algebra. Topics include business and consumer math, taxation, probability, statistics, sports and fitness, and patterns in nature.
Grade Band Audience: *9 to 12* | Mile High 3 B (Convention Center)

300
Professional Development Integrating Mathematical and Teaching Practices
Timothy A. Boerst, Meghan Shaughnessy and Kara Suzuka
We present a distinctive form of professional development experience for elementary teachers focused on teaching practices and mathematics practices, featuring **Web-based materials** for facilitators and teachers. Explore these materials and discuss the benefits and challenges of this form of practice-based professional development.
Preservice and In-Service Session
Grade Band Audience: Preservice and Inservice | 703 (Convention Center)

Friday, April 19, 2013

313
Pump Up the Volume (Measurement)
Speakers: Cheryl L. Eames, Melike Kara and Jeffrey E. Barrett
Discover new ways to enhance your volume measurement instruction with hands-on tasks. We will share video of students engaged in nonroutine tasks designed to promote understanding of what volume formulas mean and why they work. Investigate students' strategies and leave with new volume tasks that will help you enact the Common Core Standards in your classroom.
Grade Band Audience: *3 to 5, 6 to 8* | 203 (Convention Center)

317
Building Engineers in Middle School through STEM Activities
Speaker: Mary C. Enderson
STEM education challenges teachers to integrate science, **technology**, engineering, and math concepts into the classroom. Learn about the engineering design process and identify how students can implement it to engage in hands-on activities in engineering. See how to develop math students into strong engineers.
Grade Band Audience: Preservice and Inservice, 6 to 8 | Mile High 3 B (Convention Center)

323
Nspiring Investigations of Quadrilaterals and Their Properties
Speaker: Ilene Hamilton
Participants will use the Geometry utility on the **TI-Nspire** handheld to construct various quadrilaterals and dynamically transform them to explore properties of the quadrilateral family. We will focus on an interactive approach to enhance your students' abilities to visualize and conjecture, using reasoning to prove properties they have discovered.
Grade Band Audience: *9 to 12* | 107/109 (Convention Center)

326
Technology: A Portal to Exploration and Discovery
Speaker: Kenn L Pendleton
Technology affords unique opportunities for exploration and discovery and fosters the development of greater in-depth understanding. Experience how this is possible when investigating the meanings of fractional exponents and logarithms. **Technology** enables the connection between the two to be made effectively and efficiently.
Grade Band Audience: Higher Education, 9 to 12 | 705/707 (Convention Center)

327
van Hiele through Volume
Speaker: Lloyd Hugh Allen
Using the case study of volume, we will step through the van Hiele levels of thought. Using physical and instructional **technology** (3-D modeling), we will go from a wet "level one" demo through multiple perspectives on Cavalieri's principle (levels three and four), finishing up with abstraction to non-Euclidean volume.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 401/402 (Convention Center)

341
Using Technology to Drive Inquiry in Mathematics
Speakers: Leigh Haltiwanger and Bob Horton
How can **technology** foster inquiry in mathematics? We will share cognitively demanding mathematical tasks that rely on technology to promote mathematical inquiry.
Grade Band Audience: Preservice and Inservice, 6 to 8 | 503/504 (Convention Center)

342
Connect Four! Linking Graphical, Numerical, Algebraic, and Written Representations
Speaker: Greg Faulhaber
Using sets of cards, we will match graphs, tables of values, equations, and written descriptions of a variety of functions, including quadratic, polynomial, rational, radical, trigonometric, and exponential/logarithmic. See how to create your own set of cards by using the **TI emulator** and The **Geometer's Sketchpad**.
Grade Band Audience: *6 to 8, 9 to 12*
Centennial Ballroom A (Hyatt Regency)

343
Cups, Ropes, and Licorice: Making Sense of Rate of Change
Speaker: Jennifer M Campbell
Do you have a hard time making the connection between slope and rate of change in your algebra class? We will use cups, ropes, and licorice to demonstrate slope and rate of change, and you will leave with several concrete, hands-on ideas for teaching rate of change. We will use **TI-84 calculators.**
Grade Band Audience: *9 to 12, 6 to 8* | Mineral Hall A-C (Hyatt Regency)

344
Investigations of Paper Folding and Regular Polygons
Speakers: Edward M. Knote and Evonne Pankowski
We will investigate the paper-folding activities found in chapter 4 of *Mathematical Reflections: In a Room with Many Mirrors*. First we will dive right into the procedures of the FAT (fold and twist) methods of folding regular polygons. We will explore this concept both on paper and with **GeoGebra software**.
Grade Band Audience: *9 to 12, 6 to 8* | 103/105 (Convention Center)

347
Alternative Assessments in Geometry
Speaker: Janet C Kagan
Definitely not your traditional paper–pencil tests. The assessments include a scavenger hunt, photo search, and origami. Content assessed includes special segments of a triangle with points of concurrency, transional geometry, and areas of regular and nonregular polygons. Bring laptops with The **Geometer's Sketchpad** and we will model the hunt.
Grade Band Audience: *9 to 12* | Mile High 3 C (Convention Center)

348
A Very Sweet Introduction to Recursion, Reasoning, and Sense Making
Speaker: Laurie Bass
We will share mathematical questions, based on a simple algorithm for sharing candy, that offer students an opportunity to use recursion and a **graphing calculator** to obtain answers and results that are astonishing. The sharing of candy leads to a surprising equilibrium that can be used as the basis of a reasoning and sense-making activity.
Grade Band Audience: *9 to 12* | Four Seasons 4 (Convention Center)

351
What's So Cool about Sierpinski?
Speakers: Rachelle D Meyer, Shandi Spruill and Trena L. Wilkerson
Want to build the amazing Sierpinski tetrahedron and really learn the mathematics behind it? Explore **fractals** and compare the volume of the Sierpinski tetrahedron and its complement while creating what you have seen in pictures. Take away an engaging lesson and resources. We will also share feedback from when students were challenged to think.
Grade Band Audience: *9 to 12* | 704/706 (Convention Center)

352
Using Video Clubs to Examine Student Thinking about Algebra
Speakers: Miriam Sherin, Elizabeth Dyer and Janet Walkoe
Video clubs are a powerful way for teachers to work with colleagues to explore student thinking. Experience a new video club professional development program designed to foster substantive discussion of the teaching and learning of algebra. Explore tips to create and sustain video clubs.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 708/710/712 (Convention Center)

356
Reaching Girls Online: Another Path to Math
Speakers: Lynda R. Wiest, Stephanie Vega and Heather Glynn Crawford-Ferre
Explore strategies to reach girls online by providing resources, networking opportunities, and monitored social networks as a modern way to enhance girls' math learning and interest. We will address considerations for including parents and girls from varied backgrounds, and we will share useful resources.
Grade Band Audience: General Interest/All Audiences | Mile High 4 A/B (Convention Center)

357
Using Technology and Exemplary Problems from Illuminations to Motivate Students
Speaker: Patrick Vennebush
The 600 lessons and 100 apps on the Illuminations website (http://illuminations.nctm.org) contain rich mathematical tasks that allow for student investigation. Come be a student and try to solve some of these problems and then discuss how you can use or modify them to motivate students in your class. More
9:30 AM-10:30 AM Mile High 4 A/B (Convention Center)

358
A Rainbow of Problem-Solving Strategies Used by K–2 Students
Speakers: Linda L. Walker and Charity Bauduin
View and discuss **video clips** of K–2 students doing mathematics. Students will be solving a variety of problem types identified in Common Core State Standards. Student explanations are thought provoking and may bring a smile, an aha, or even a wow. You will leave eager to listen to your students as they solve problems in your classroom.
Grade Band Audience: *PreK to 2* | Capitol Ballroom 1-3 (Hyatt Regency)

375
Reasoning and Proof: The Role of Tasks and Questions
Speaker: Gail Burrill
How do we choose tasks that engage students in reasoning and proof? How do we make sure the questions we ask probe to find out what students are thinking or push them to make connections? Explore examples from algebra, geometry, and statistics, and consider how interactive **dynamic technology** can support student learning.
Grade Band Audience: *9 to 12, 6 to 8* | Four Seasons 2/3 (Convention Center)

379
Making Sense of a Stunning Approximation to the Sine Function
Speaker: Ron Lancaster
We will examine a little-known function that is a ratio of two quadratic functions. Discovered 1,400 years ago, it provides an exceptionally close approximation to the sine function. Using technology, we will see that the approximation is stunning. We will explore how to use the approximation as the basis of a reasoning and sense-making activity.
Grade Band: Preservice and Inservice, 9 to 12 | Centennial Ballroom F (Hyatt Regency)

384
Build Student Visual Schema for Solving Word Problems
Speaker: Erich Zeller
Learn how to use interactive visual puzzles to offer all students access to word problems while promoting problem solving and algebraic thinking. Receive **software** and strategies to use in class for connecting visual models, word problems, and equations involving unknowns. Focus will be on K–2 addition and subtraction situations.
Grade Band Audience: *PreK to 2* | 603 (Convention Center)

386
The Ripple Effect: Inspiring Problem Solving across Grade Levels
Speakers: Devin E Anderson, Renee L Snyder and Susan M Signet
ou have your data; now what? This hands-on workshop includes iPads and lessons that bring the mathematical practices to life. Experience how analyzing data and collaborating across grades encourages student reasoning and communication. Walk away with tiered lesson plans, iPad apps, literature connections, and snack-tivities.
Grade Band Audience: *PreK to 2*
Four Seasons 4 (Convention Center)

389
Spacing Out: Spatial Reasoning and the Common Core State Standards
Speakers: Jennifer Rising and Peggy McLean
Spatial reasoning seems to have disappeared during No Child Left Behind, but now it is back in the Common Core. Explore creative and fun activities that your students will love, first using paper and scissors, and later with iPad apps. The geometry standards will come alive for your students.
9:45-11:00am Grade Band Audience: *3 to 5* | Mile High 3 A (Convention Center)

395
Regular Polygons with Fraction Circles
Speakers: Armando M Martinez-Cruz, Jose Contreras and Patrick Kimani
Some Greeks constructed regular polygons by using tools other than ruler and compass. We follow this idea and use fraction circles (typically used in schools for fraction arithmetic) to construct and investigate properties of regular polygons. We also show how to quickly construct regular polygons with geometry software. Handouts provided.
Grade Band Audience: *3 to 5, 6 to 8* | Mineral Hall D/E (Hyatt Regency)

396
Bar Modeling, Percent Decrease, and the Common Cold
Kathleen Hill and Jennifer Luebeck
For a STEM project, a team of middle and high school math and science teachers developed this lesson. It uses the investigative approach with an interactive computer simulation and the mathematical tool of a bar model to help students make sense of the variables that affect the spread of disease.
Grade Band Audience: *6 to 8* | 111/113 (Convention Center)

402
Stories and Technology: Providing Mathematics Opportunities for All
Speakers: Dennis DeBay, Karen L Terrell and Neal McDonald
Language underpins the development of mathematical concepts. Through the union of storytelling and technological tools such as interactive whiteboards, PowerPoint, and Web-based assistive technologies, we will explore an interactive means to provide access to mathematics for all learners, including English language learners and students with learning disabilities.
Grade Band Audience: 9 to 12, 6 to 8 | 708/710/712 (Convention Center)
9:45 AM-11:00 AM

404
Conjectures and Quadrilaterals: Proof versus Convince Me
Speaker: Ray Klein
In most geometry classes, students are asked to prove statements about quadrilaterals. Shouldn't a first step be for them to discover the properties of these figures? Before we ask the "p question" (prove to me), shouldn't we first ask the "c question" (convince me)? Come see how this can be accomplished with **dynamic geometry on a calculator**.
Grade Band Audience: *9 to 12* | 403/404 (Convention Center)

406
Explore Real-World Relationships through Mathematical Modeling
Speakers: Elizabeth Gasque and Judith Hicks
Use data collection activities and real data sets (including data collected by scientists to monitor fish populations) to engage students and help them develop a better understanding of how mathematical models are used in the real world. We will graph data with the TI-Nspire CX and explore a variety of functions.
Grade Band Audience: *9 to 12* | Centennial Ballroom E (Hyatt Regency)

409
Digitizing Preservice Teachers' Voices of Mathematical Justification: Assessing Algebraic Thinking
Speakers: Diane Rogers, Alden J. Edson and Christine A. Browning
Explore using assessment-for-learning strategies to develop preservice teachers' reasoning and sense-making habits of mind in algebra. Engage in a group problem-solving task, video-record the work, and assess justifications across groups by using **digital tools**. Bring your own laptops or iPads.
Grade Band Audience: Preservice and Inservice | Centennial Ballroom G/H (Hyatt Regency)
11:00 AM-12:00 PM

410
iPad 1.1: What We Learned Our First Year
Speakers: Shelly Moses and Kelli Cox
Are you implementing iPads? Find out what we learned after our first year. Reproduce our successes and avoid our mistakes. Learn how to use the devices to create content that requires critical thinking and to promote mathematical literacy according to the Common Core. Learn management tips and tricks. **iPads** are so much more than **apps**.
Grade Band Audience: General Interest/All Audiences | 601 (Convention Center)

423
Fractals: The Intersection of Math, Science, and Art
Speakers: Shephali K Chokshi-Fox and Victoria L. Miles
Fractals capture students' imagination, inviting them to explore patterns found in the world around them. Learn how you can use fractals as a springboard to explore number sense, area, perimeter, patterns, and algebra. Use the **Illuminations Fractal Tool** to explore the properties of self-similarity and have your students make their own fractal.
Grade Band Audience: *6 to 8, 3 to 5* | 709/711 (Convention Center)

424
Fraction Conversations: Effective Questioning and Technology Tools to Improve Instruction
Speakers: Mary Elizabeth Mendenhall and Lauri Susi
It's all about asking the right questions and listening to students. We will describe a successful professional development project supporting teachers in improving effective mathematical classroom discussions grounded in key Common Core fractional concepts with technology tools. We will also share implementation process materials. **More about Conceptua math** at this conference.
Grade Band Audience: *6 to 8, 3 to 5* | Centennial Ballroom D (Hyatt Regency)

427
How Do I Build/Sell Thee? Let Me Count The Ways
Speaker: Ilene Kanoff
Discover a multidimensional approach to learning about perimeter, area, and volume by building a home from start to finish within a budget. Through paper and computer models, students explore these concepts while creatively constructing a home they then try to sell. View projects and leave with ideas about how to use this project with your class.
Grade Band Audience: *6 to 8* | Mineral Hall F/G (Hyatt Regency)

429
Developing Fraction Sense and Proportional Reasoning with Action–Consequence Applets
Speakers: Wade Ellis, Gail Burrill and Thomas Dick
Investigate a suite of applets designed to develop understanding of fractions and proportions. We will consider how applets and well-posed questions can engage students in reasoning about mathematics. Also, we will examine student work for evidence of understanding.
Grade Band Audience: Preservice and Inservice, 6 to 8 | 203 (Convention Center)

431
No More Excuses: Reaching Students of Various Abilities through "Flipping"
Speakers: Karen Strader, Ilana B Marcus and Stephanie Adams
Are your students engaged during class? We will share our experience flipping math classes at various ability levels. Students watch our notes online for homework and spend class time deep in exploration and practice. We combined the forces of Livescribe, Jing, Google, and Khan Academy to teach our students. Learn how to do this in your classroom.
Grade Band Audience: *9 to 12, 6 to 8* | 505 (Convention Center)

434
Engaging Students and Addressing Standards in a Multiplayer Online Game
Speakers: Louisa Rosenheck and Susannah Gordon-Messer
Immerse yourself in MIT's virtual game world that engages high school math students. Learn how the game addresses the Common Core and gives real-time teacher feedback about student learning. Sign your class up to play.
Grade Band Audience: *9 to 12* | 102 (Convention Center)

436
Flipping Calculus
Speakers: Jean M. McGivney-Burelle, Larissa Schroeder and Mako Haruta
We will describe our experiences flipping calculus. We will discuss the technology and logistics involved as well as the benefits and challenges of this pedagogy. See and discuss a sample of short videos and collaborative in-class activities. We will also share preliminary student and instructor survey data.
Higher Education Session
Grade Band Audience: Higher Education, 9 to 12 | 405 (Convention Center)

437
Supporting Beginning Teachers through Online Social Communities
Speakers: Emily Thrasher and Ayanna Franklin
Explore how to cultivate a supportive community for beginning mathematics teachers through online collaborative environments. Discuss how to engage beginning teachers in professional development opportunities, reflection, and research-based practices.
Grade Band: Preservice and Inservice, Higher Education | 605 (Convention Center)

447
Movie Making in Math
Speaker: Catherine W Greenslade
Students take an active part in learning new skills when they create their own short videos explaining concepts and giving examples. See how one fourth-grade class created an easily accessible resource of videos to reinforce their learning.
Burst Session
Grade Band Audience: *6 to 8, 3 to 5* | Mile High 3 C (Convention Center)

450
Dynamic Euclid: Using GeoGebra to Construct and Present Geometric Proofs
Speaker: Jeffrey Hall
Using **GeoGebra**, a free and open-source software program, you can easily construct and dynamically present geometric proofs. Learn how to construct Euclidean geometric proofs, present the constructions dynamically, and share creations with secondary students or the global community of **GeoGebra** users.
*9-12 Burst Session Session*Grade Band Audience: *9 to 12* | 503/504 (Convention Center)

453
Incorporating Different Learning Styles into Online College Statistics Courses
Speakers: Judi A Ink and Elisabeth Suarez
Activities that have been successfully used in the traditional classroom can be creatively translated to the online environment while addressing the three learning styles. This presentation will guide professors who are new to the virtual classroom and want statistics classes that energize students with an excitement for learning.
Higher Education Burst Session Session
Grade Band Audience: *Higher Education* | 506/507 (Convention Center)

466
Response to Intervention: Identifying and Building on Students' Mathematical Understanding
Speakers: Katherine E Lewis, Marie B Fisher and Helen Thouless
Explore how assessments of student understanding can inform the design of instruction in a response to intervention model. We share videotaped examples and student work for topics including counting principles, arithmetic operations, and fractions. We will discuss implementation in a classroom or special education context.
Grade Band Audience: *3 to 5* | Centennial Ballroom B/C (Hyatt Regency)

468
Scan It, Solve It, Show It
Speakers: Joan Smith and Kelli Shrewsberry
Are you "scanning" the world, looking for ways to engage your students? Power up student engagement by using QR codes to launch rich problems presented through animated videos. Learn how to create your own animated videos and QR codes to replicate this idea with your students. (BYOT: iPad 2 or 3, iPhone, iTouch 4+, tablets.)
Grade Band Audience: *3 to 5, 6 to 8* | 203 (Convention Center)
12:30-1:30pm

470
Your View, My View: Show and Win Me Over
Speakers: Cynthia Seto and Lisa Choy
A spreadsheet allows teachers to design tasks for students to manipulate pictorial and quantitative inion and to make and test conjectures as they discover relationships between variables. This approach promotes mathematical argumentation. These different viewpoints are rich resources to develop students' mathematical competencies, such as justification.
Grade Band Audience: *6 to 8, 3 to 5* | 505 (Convention Center)

471.1
A Smart Way to Thrive in Algebra
Speakers: Vanessa E Cleaver and Marcelline Carr
This session details strategies, including a professional development model, used in a district's summer and Saturday programs that promote access and equity for all students in algebra 1. Engage in hands-on activities, including technology and games, that drive student motivation to learn.
Grade Band Audience: *6 to 8* | 709/711 (Convention Center)
12:30-1:30pm

476
Help Students Understand Slope and Graphs with Free Smartgraphs Software
Speakers: Andrew A Zucker and Carolyn Staudt
After traditional instruction, more than 40 percent of students still have trouble understanding average velocity and other slope-related concepts. Learn to use free **SmartGraphs software** that helps students understand slope. There is nothing to download; activities run directly in a Web browser. You can even create and share your own activities.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 2 C (Convention Center)

480
Transional Geometry and the Core Math Tools
Speaker: W. Gary Martin
The Common Core State Standards call for an emphasis on transitional geometry, which is unfamiliar to many students and teachers alike. See how you can use the Core Math Tools, a

suite of software tools available free from the NCTM website, to introduce transions and extend their use to more advanced geometric concepts.
Grade Band Audience: *9 to 12, 6 to 8* | 705/707 (Convention Center)

481
Using Technology Simulations to Reason about Probability and Statistics
Speakers: Hollylynne Lee and Blake Whitley
We will explore two tasks, using a variety of **technology tools** to conduct simulations modeling actual data and to compare likelihoods of different events. We will discuss building models, conducting repeated samples, and dynamic graphs as ways to promote reasoning among students. You will share data via text message and website polls.
Grade Band Audience: *9 to 12, 6 to 8* | 108 (Convention Center)

483
Take Time to Question the Questions
Speaker: Mark Howell
With the help of **technology**, math teachers have a rich array of engaging exploration environments to lay before students. It takes thoughtful reflection, though, to construct meaningful and appropriate questions. We will see activities from algebra, geometry, and calculus and explore what makes a question good.
Grade Band Audience: *9 to 12* | 709/711 (Convention Center)

492
Reading and Writing: In Math Class?
Speaker: Lori Price
Use children's literature books and math journals to engage children in problem-solving activities that encourage development of the Standards for Mathematical Practice. Leave with activities you can use in the classroom on Monday. Student work samples and video clips will give a glimpse into how this looks in the classroom.
Grade Band Audience: *PreK to 2* | 704/706 (Convention Center)

499
The Good, the Bad, and the Ugly: Fractions
Speaker: Christine Ruda
Fractions don’t have to be ugly. Discover how good use of the SMART Board, TI-34 Multiview, and manipulatives combine to build conceptual understanding and make fractions meaningful and fun. Hands-on activities will integrate unique features of the technologies, appropriate for all learners. Leave with ready-to-use lessons, guided by the Common Core State Standards.
Grade Band Audience: Preservice and Inservice, 3 to 5 | Four Seasons 4 (Convention Center)

502
Help Students Dig into Data, Statistics, and Probability with TinkerPlots
Speaker: Elizabeth DeCarli and Karen M. Greenhaus
We’ll explore the Common Core Statistics and Probability Standards for grades 6–8 by using TinkerPlots. We’ll generate data through hands-on activities and then use TinkerPlots to morph and manipulate graphs to create colorful representations of real-world data. Bring your own laptop to play along.
Grade Band Audience: *6 to 8* | Mile High 2 B (Convention Center)

507
Parabolas, Ellipses, and Hyperbolas: From Paper Folding to the iPad
Speaker: Arthur T. Mabbott
Develop a deeper understanding of the definition of parabolas, ellipses, and hyperbolas by paper folding; discover that what looks like each conic section is really the "envelope" of tangent lines; find where the loci of points actually is; mimic the same actions by using the iPad; and compare the ellipse with the hyperbola.
Grade Band Audience: *9 to 12* | Mineral Hall D/E (Hyatt Regency)

508
Statistical Inference through Simulation
Speaker: Paul L Myers
Through hands-on techniques and technology to conduct simulations, we will explore concepts of statistical inference. These simulations (randomization tests) offer more flexibility in the hypotheses our students can test and allow them to focus on conceptual understanding and statistical thinking.
Grade Band Audience: *9 to 12* | 603 (Convention Center)

509
The Mathematics of Forensic Science
Speaker: Martha Peters
Sample activities in forensic science that use mathematics. Activities will include snippets from crime scene mapping, blood pattern analysis, anthropology, odontology, taphonomy, and crash scene investigations. The mathematics used will range from prealgebra to calculus 2 concepts. Please bring a calculator.
Grade Band Audience: *9 to 12* | Centennial Ballroom G/H (Hyatt Regency)

511
Reasoning and Sense Making with CAS: Generalizing Patterns in Algebra
Speaker: Donald T Porzio
According to the Common Core, students are to learn how to use appropriate tools, such as a computer algebra system (CAS), strategically. Investigate how you can use a CAS to help students make sense of and generalize patterns in algebra, as per the Common Core high school content standard for algebra.
Grade Band Audience: 9 to 12, Preservice and Inservice | 104/106 (Convention Center)

518
Model for a Self-Paced, Flipped Mathematics Classroom
Speaker: Steven Alan Harris
Explore the theory, rationale, and fleshing out of a flipped mathematics classroom. I will explain an actual working model, from the theoretical foundation to the end product. This presentation will detail classroom procedures, outside of class procedures and grading procedures
Grade Band Audience: General Interest/All Audiences | 102 (Convention Center)

520
Using Video Mosaic Collaborative Repository to Promote Student Reasoning
Speaker: Carolyn A. Maher and Marjory F. Palius
Explore the **open-source, online resources** of Video Mosaic Collaborative (VMC) to support teaching practices that promote development of student reasoning in mathematics. The VMC videos and related resources come from long-term research and span elementary to secondary levels in several mathematics content areas.
Grade Band Audience: General Interest/All Audiences | 601 (Convention Center)

527
iPad Apps That Work in Our Mathematics Classrooms
Speaker: Timothy W. Pelton and Leslee Francis Pelton
Many educational apps exist for the **iPad**, but finding apps that go beyond drill and practice is difficult. We will share apps that offer opportunities for students to explore, reason, discuss, and understand mathematical concepts and that support consolidation and practice. We will also share strategies for classroom use of **iPads**.
Grade Band Audience: *6 to 8, 3 to 5* | Mile High 2 C (Convention Center)

528
iSolve with iPad
Speakers: Donna Gee and Trey Smith
This session offers ideas for teachers and students at the middle school level to use the **iPad**, with a focus on algebraic reasoning. We will discuss and share apps used to help students learn math and for teachers to use in teaching.
Grade Band Audience: *3 to 5, 6 to 8* | Mile High 2 A (Convention Center)

529
English Language Learners' Use of Gestures in Arguments
Speaker: Anthony Fernandes
See how English language learners (ELLs) make a convincing argument by incorporating gestures along with speech. We will also analyze gestures through **video clips** that involve ELLs' communicating their thinking.
Grade Band Audience: *6 to 8* | 405 (Convention Center)

531
Our iPad Story: Helping Our Students Develop Their Practice
Speakers: Erin Igo and Beth Nickle
Sustainable student learning happens when students' abilities are validated, explored, and challenged in an environment that fosters student discourse. We'll share how we've been using **iPad video features** in middle school math classrooms to develop students' accountable talk and deepen students' mathematical practices.
Grade Band Audience: *6 to 8* | Capitol Ballroom 4 (Hyatt Regency)

533
Tools and Activities to Support Statistical Reasoning and Sense Making
Speakers: Mary Majerus, Debbie Perkowski and Michael Perkowski
Learn how to use NCTM's **free online statistics tools** to simulate probability experiments, collect and display data, and analyze the results. Engage in activities that address the Common Core State Standards for Mathematics, encouraging students to make sense of statistical concepts, describe and compare data sets, discuss probabilities, and draw reasonable conclusions from data.
Grade Band Audience: *6 to 8* | 702 (Convention Center)

537
Student Response Systems and Getting Students Talking
Speakers: Brandon Milonovich, Helen M Doerr and Collin Bruce
Clicker question use in classrooms has grown rapidly, but how does a teacher effectively integrate them into instruction? Although clicker questions provide feedback, they are significantly more useful in engaging students in discussion. We will examine what makes a good clicker question and present strategies for using them in the classroom.
Grade Band Audience: *9 to 12* | Mile High 4 E/F (Convention Center)

538
Modeling Data with Core Math Tools: Enhancing Mathematical Practices Implementation
Speaker: Erin Elizabeth Krupa
Explore using Core Math Tools, a suite of free Java-based mathematical software tools, to model algebraic data. We will use the Computer Algebra System and Spreadsheet features to enhance implementation of Common Core content and mathematical practice standards.
Grade Band Audience: Preservice and Inservice, 9 to 12
401/402 (Convention Center)

539
Transional Geometry: Linking Geometry and Algebra with the Common Core
Speaker: Vivian La Ferla
Explore how to get students to think geometrically and algebraically about transional geometry, its properties, and its algebraic representation. The Common Core and international curricula offer rich tasks that include **technology**; cultural perspectives; and connections to mathematics, art, and science.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 207 (Convention Center)

540
Two of the Calculator's Lesser-Known Modes: Sequence and Parametric
Speaker: David Kapolka
Ever wonder how a daily dose or megadose of medicine affects you? We will explore medical and environmental applications of convergence. We will also explore parametric representations including motion in applications, baseball, the classic train problem, Lissajou figures, complex powers and roots, inverse of functions, rose curves, and conics.
Grade Band: Preservice and Inservice, 9 to 12 | Centennial Ballroom B/C (Hyatt Regency)

541
Energizing Geometry, Reasoning, Proof, and Mathematical Practices through Technology
Speaker: Gina M. Foletta
Dynamic geometry environments (DGEs) help students explore mathematics while generalizing, reasoning, and proving. Get examples that address Common Core State Standards for Mathematics for geometry and mathematical practices through constructing viable arguments. Specific examples will use both a **computer DGE** and an **iPad applet**.
Grade Band Audience: Preservice and Inservice | Mile High 4 A/B (Convention Center)

542
Mathematical Modeling: The Core of the Common Core State Standards
Speaker: Christian R Hirsch
As a Common Core Content Standard and a Standard for Mathematical Practice, mathematical modeling affords a rich opportunity around which to develop and unify the mathematical content of the high school conceptual categories and the mathematical practices. We will examine several illustrative modeling tasks by using **NCTM's free software, Core Math Tools**.
Grade Band: Preservice and Inservice | 203 (Convention Center) | 2:45 PM-4:00 PM
Highlight: **See article about Dr. Hirsch's work**.

550
Graph, Analyze, Play: Address the GAP and "Excel" in Math
Speakers: Anna LaForgia, Ginalouise Palermo and Alyse Jennifer Sciolla
Increase your knowledge of spreadsheet creation and functions while exploring games, graphs, and problem solving. Simultaneously develop your students' working knowledge of technology while addressing both Process and Content Standards in your classroom. Explore simple yet powerful ways to incorporate spreadsheets into your current curriculum.
Grade Band Audience: *6 to 8, 3 to 5* | 708/710/712 (Convention Center)

551
Interactive Reasoning Leading to Proof with Online Tools and Games
Speaker: David Barnes
Make your classroom come alive while developing reasoning, sense making and proof. NCTM's free online games and interactive applets are perfect for you to demonstrate key content topics in your classroom and for your students to investigate mathematical conjectures on their own. We will use both physical manipulatives and online/mobile tools.
Grade Band Audience: *6 to 8, 3 to 5* | Four Seasons 4 (Convention Center)

553
Math Snacks: Animations and Video Games Teaching Middle School Math
Speaker: Karen M. Trujillo
ath Snacks animations and video games are free tools accessible to teachers and parents, teaching essential middle school math concepts such as ratio, proportional reasoning, number line, and number sense. See these tools in action and use them tomorrow in your class. We will view an animation, play a game, and discuss student learning.
Grade Band Audience: *6 to 8* | Mile High 3 C (Convention Center)

554
NASA: Distance–Rate–Time Math in Air Traffic Control
Speakers: Rebecca Green and Gregory Condon
Learn to predict and solve real-world problems in air traffic control by using a hands-on experiment, a Web-based interactive graphing tool, and print-based instructional materials. You will apply distance–rate–time relationships at the prealgebra and algebra levels. All materials are free and readily available on the Internet.
Grade Band Audience: *6 to 8* | Mile High 1 A/B (Convention Center)

557
AP Calculus: Strategies to Support All Learners
Speaker: Carol A Hynes
Math teachers need to use strategies in Pre-AP and AP Calculus that will make calculus concepts and skills more accessible to students. We will try out strategies/graphic organizers: rule of 4 link sheets, sorts/matches, webs, concept splashes, labs, and learning stations. You will gain access to our website with hundreds of examples
Grade Band Audience: *9 to 12, 6 to 8* | 111/113 (Convention Center)

559
Linearity: A Moving Experience in Reasoning
Speakers: Fay Zenigami, Judith Olson and Melfried Olson
Experience tasks adapted from curriculum materials developed in a professional development project that focused on linearity and graphing, two tough-to-teach, tough-to-learn topics in algebra. We describe teachers' experiences with the lessons and share **video** and samples of student work.
Grade Band Audience: *6 to 8, 9 to 12* | 506/507 (Convention Center)

560
Powerful Online Tools Promote Powerful Mathematics
Speakers: Eli Luberoff and Patrick Vennebush
The **free calculator** available from Desmos (www.desmos.com) allows for exceptional graphing. Combine this tool with the resources at Illuminations (http://illuminations.nctm.org) to create powerful lessons. Learn how to combine these two resources to craft exceptional mathematical experiences for your students. **BYOD**, and get ready to get funky.
Grade Band Audience: *9 to 12, 6 to 8* | 406/407 (Convention Center)

565
Blogarithms: Converting Number Concepts into Talking Points
Speakers: Wendy W Prater and Beverly G Frederick
Connect your students to each other and to the outside world through **blogging**. Students gain a deeper understanding when they write about math. Blogs enable students to write, ask questions, collaborate, and research—and **blogs** will do the same for you. Bring your own **wireless device** for a completely paperless experience.
Grade Band Audience: Preservice and Inservice | 104/106 (Convention Center)

566
Building Mathematics Learning Communities with NCTM Reflection Guides
Speaker: Chonda L Long
Explore journal articles that NCTM's Professional Development Services Committee has enhanced with reflection guides, available for free online. We will model how to use the reflection guides to build school-based professional learning communities.
Grade Band Audience: Preservice and Inservice
603 (Convention Center) | 3:30 PM-4:30 PM

571
Pedagogy and Student Engagement Enhanced with Livescribe SmartPens
Speakers: Peter M Eley and Elizabeth K Rogers
Discover how we engaged and motivated students to do their work at home, with the same detail and attentiveness as done in the classroom. Learn how to (1) cover more in your class; (2) personalize tutoring, without any extra work; (3) build your teaching portfolio for later use; and (4) engage low-, average-, and high-level students at once.
Grade Band Audience: General Interest/All Audiences
Mile High 2 C (Convention Center)

573
Science and Mathematics in Cinema: Can the Event Happen?
Speaker: John C. Park
The magic of the **cinema** allows the storyteller to engage our minds in the possible and the impossible. With proper editing, the silver screen can allow our minds to accept just about anything. Measurements can be made or inferences can be generated that enable us to analyze the scene. Explore how this can be done.
Grade Band Audience: General Interest/All Audiences | 107/109 (Convention Center)

580
Discover Mathlanding: Resources and Tools for Elementary Specialists and Teachers
Speakers: Betsy Peisach and Pat Hemler
Elementary math leaders and teachers will learn about **Mathlanding**, a project focused on improving the knowledge and instruction of elementary math. Developed to support professional development, Mathlanding harnesses the **best free resources on the Web** for use as an effective, **technology-driven tool**.
Grade Band Audience: *3 to 5, PreK to 2* | Mile High 1 C/D (Convention Center)

586
Moving Beyond the Right Answer: Developing Students' Math Communication Skills
Speakers: Suzanne Alejandre and Erin Igo
The Math Forum's rubric emphasizes a combination of good problem solving and strong mathematical communication. We score in six areas, including interpretation, strategy, accuracy, completeness, clarity, and reflection. We'll share stories from **online** and classroom exchanges of our efforts to help students develop mathematical communication skills.
Grade Band Audience: *6 to 8, 3 to 5* | 601 (Convention Center)

591
Making a Computer Speak Math Like a Teacher Would
Speakers: Beth Brownstein and Susan A. Osterhaus
Synthetic speech for math is just getting started: it doesn't always speak math the way you'd like and isn't interactive. We're developing **synthetic speech** for high school algebra that speaks it better—and you can customize it too. (Funded by a grant from the U.S. Department of Education Institute for Education Sciences.)
Grade Band Audience: *9 to 12, 6 to 8* | 108 (Convention Center)

594
What Were They Thinking? Going Beyond "Show Your Work"
Speakers: Mary Lou Metz and Edel Reilly
How do you know what your students are thinking? With smartpens, you can not only see their work but also hear their thinking and reasoning as they solve problems. See how we used **smartpens** with preservice elementary and middle-level math teachers and what we learned about our students' mathematical thinking.
Grade Band Audience: Preservice and Inservice | 203 (Convention Center) | 3:30-4:30 pm

Saturday, April 20, 2013

603
Measure What Matters: Building an Assessment System for Everyone's Learning
Speaker: David Woodward
Explore teacher-created rubrics, student anchors, and assessment tasks aligned with the Common Core, organized and accessible **online**, with integrated data collection and reporting. Boulder Valley Schools and the CDE have worked with www.forefrontmath.com to make this this session—combining professional development, professional learning communities, and response to intervention—a reality.
Grade Band Audience: *3 to 5, PreK to 2* | 705/707 (Convention Center) | 8:00-9:00am

605
Developing Reasoning through the 5E Learning Cycle
Speakers: Jennifer J. Wall and Heidi N. Beatty
The use of the 5E Learning Cycle lesson plan model is growing in mathematics education, but still far too few math teachers know about it. We will specifically look at using technology in the Exploration phase to increase your students' comprehension and reasoning skills and to develop specific Mathematical Practices specified in the Common Core.
Grade Band Audience: Preservice and Inservice, 3 to 5 | 505 (Convention Center)

607
Teaching Students Principles for Comparing Fractions
Speaker: John Laskarzewski
Examine important principles that students must understand to compare fractions. We will explore each in a variety of contexts and models, including manipulative materials and free **online tools**, to help students understand and extend their previous understandings of whole numbers to fractions.
Grade Band Audience: *3 to 5, 6 to 8* | Mile High 4 E/F (Convention Center)

608
Leveraging Middle School Students' Algebraic Understanding: Predict, Check, and Explain
Speakers: George J. Roy, Phillip Vahey and Vivian Fueyo
Middle school teachers often search for ways to assess their students' understanding. Explore middle school students' conceptions of rate and proportionality, as well as ways to develop this understanding by using **dynamic technology** and the heuristic Predict, Check, and Explain.
Grade Band Audience: *6 to 8* | 703 (Convention Center)

609
Mobile Math: Understanding the CORE Mathematics in Mobile Apps
Speakers: Christine C. Benson and Sara H. Rogers
Using mobile apps can be intriguing, but we must go beyond just "That looks cool!" to "Oh, I see the math!" Come see examples of mathematical reasoning with middle school students using apps (not exclusively iApps), even some not touted as "educational" apps. Go beyond just generating interest. Find and justify the math in the app.
Grade Band Audience: Preservice and Inservice, 6 to 8
207 (Convention Center)

612
Calculator Scene Investigation
Speaker: Mary R. Walz
What type of polygon does this look like? This is a lesson on providing numerical evidence to prove the type of polygon. "It looks like a . . ." is not sufficient evidence. After we gather and calculate numerical evidence, and present a case, a decision will be rendered before the jury convicting the polygon of classification.
Grade Band Audience: *9 to 12* | 506/507 (Convention Center)

630
Reasoning and Proof with Free NCTM Interactive Applets and Games
Speaker: Sarah Marie DeLeeuw
Enliven your classroom while developing reasoning, sense making, and proof. **NCTM's free online games** and **interactive applets** are perfect for you to demonstrate key content topics in your classroom and for your students to investigate mathematical conjectures on their own. We will use both physical manipulatives and online/mobile tools.
Grade Band Audience: *3 to 5, 6 to 8* | 708/710/712 (Convention Center)

633
Struggling Learners Can Discover, Defend, and Demonstrate Common Core Practices
Speakers: Connie S. Schrock
Participate in strategies that engage struggling students with high-cognitive-demand problems. Each problem offers the opportunity to demonstrate the mathematical practices, ways to motivate the learner, use of **technology tools**, scaffolding to make the problem accessible, conceptual development, and examples of ive performance assessments.
Grade Band Audience: *6 to 8* | 10/112 (Convention Center)

635
Teach Mathematical Modeling with GeoGebra
Speaker: Lingguo Bu, Frackson Mumba and Mary Wright
GeoGebra is an **open-source learning technology** that supports mathematical modeling and problem solving in school mathematics. Discover the main features of GeoGebra in the context of mathematical modeling and reasoning involving field-tested problem situations. Bring your laptop and join the dynamics of onsite explorations.
Grade Band: Preservice and Inservice, 6 to 8 | Mile High 1 A/B (Convention Center)

651
Explain Your Thinking: Creating Comics, Videos, and Animations on iPads
Speakers: Leslee Francis Pelton and Timothy W. Pelton
See how students can quickly and efficiently create comics, videos, and animations on their iPads to show what they know and how they know it. We will share examples from number sense, ratio and proportion, geometry, and measurement.
Grade Band Audience: *6 to 8, 3 to 5*203 (Convention Center)

656
Make Math Count: Financial Literacy for a Technological World
Speakers: Leslie Williams and Michael Raskevitz
Address NCTM strands of problem solving, communication, and connections while fully engaging students with **Excel**, **Web 2.0 technologies**, and games created by Robert Kyosaki. Resources are available **online** that address income, careers, retirement, and linear and exponential growth, along with assessments differentiated by learning styles.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 4 A/B (Convention Center)

658
What, No Book? I Want to Take His Class
Speakers: Daniel R Miller and Paula R Stickles
What gives students the best opportunity to succeed? We explored this question by offering sections of college algebra where one section used an **e-book** and **online** homework, whereas the others used a traditional textbook and had no instructor-graded homework. What worked best? We share our results, including what was most important to students.
Grade Band Audience: Higher Education, 9 to 12 | 205 (Convention Center)

661
Teacher's Preparation for Geometric Black-Box Tasks with iPad
Speakers: Taehoon Choi, Melissa McAninch and Laurentius A. Susadya
Technology-based geometric black-box tasks formerly constructed by a teacher motivate students to explore unknown behavior of geometric objects and formulate/justify a conjecture. See how to prepare a black-box task for iPad and how the questioning strategies differ from those in a paper-and-pencil setting.
Grade Band Audience: Preservice and Inservice | Mile High 4 E/F (Convention Center)
9:45 AM-11:00 AM

676
Technology + Choice = Success
Speakers: Melissa G. Jackson and Meredith A. Howell
Do you long to hear your students say these three little words, "I love math"? Discover how hands-on lessons infused with technology and choice have transformed our students into highly motivated, engaged, successful learners. Highlighted technology will include TI technology, **math in movie clips**, the **SMART Board**, **Google Earth**, and **Voki avatars**.
Grade Band Audience: *6 to 8* | 708/710/712 (Convention Center)

680
An Invitation to Experience Online Lesson Study Firsthand
Speakers: Cheryl Fricchione and Diane Austin
Are you interested in lesson study but lack the support system and resources necessary to participate? Connect with other teachers just like you and form lesson study groups that will interact **online synchronously** and **asynchronously**.
Grade Band Audience: Preservice and Inservice | 607 (Convention Center)

684
Tools and Technology for Modern Math Teaching
Speaker: Dan Meyer
A lot of new tools and **technology** exist to help our students learn more meaningful mathematics. The question you may have now is, "Which tools deserve our limited time and resources?" I will offer a framework to guide you toward useful tools and more modern math teaching.
Grade Band Audience: General Interest/All Audiences | Four Seasons 1 (Convention Center)
***Highlight*: Follow Dan's blog**

685
Computers in Early Childhood: Getting the Best of All Worlds
Speakers: Julie Sarama and Douglas H. Clements
Technology use in pre-K–grade 2 is increasing. Use it to offer the best of all possible worlds—the worlds of mathematics, physical models, and **software** models; the worlds of number, geometry, measurement, and patterning; and the appropriate, combined pedagogy of the worlds of activities, problem solving, and tools.
Grade Band Audience: PreK to 2 | 705/707 (Convention Center)

697
Predator–Prey Models Meet the Common Core Standards
Speakers: Steven L. Blumsack and Robert C Schoen
We will examine mathematical models of interactions between humans and two species of fish. Discussion will focus on developing a model through data collection and analysis by using a stochastic simulation, adjusting the simulation to produce more realistic results, and formulating a discrete deterministic model.
Grade Band Audience: *9 to 12, 6 to 8* | 401/402 (Convention Center)
11:00-12:00pm

699
Using iPads to Enhance the Mathematics Classroom
Speakers: Ayanna Franklin and Emily Thrasher
Technology can help foster reasoning and sense making and motivate students. Come learn how to use free **iPad apps** to supplement instruction and mathematical understanding. If you have an **iPad**, bring it.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 2 C (Convention Center)
11:00-12:00pm

701
Using Computers Effectively in a High School Mathematics Class
Speaker: Michael B. Herzog
Computers can be used to deepen students' understanding, connections, interest, and engagement with high school mathematics. Learn about ways to use the computer as a vehicle to achieve these things. Topics include **programming, computer graphics, Wolfram-Alpha**, warm-ups and quizzes using Google Docs, flip-teaching, research, and useful **websites**.
Grade Band Audience: *9 to 12* | 102 (Convention Center)
11:00-12:00pm

702
Convincing Arguments and Proof with Core Math Tools
Speaker: Rose Mary Zbiek
Explore how **Core Math Tools** have helped prospective teachers to use mathematics technology well to inspire and produce arguments and proofs and to create related lessons for high school students. Mathematics topics include big ideas and essential understandings of geometry, function, statistics, and proving.
Grade Band Audience: Preservice and Inservice | 107/109 (Convention Center)

705
Using Video Study to Improve the Design of Mathematics Lessons
Speaker: Thomas E. Ricks
Learn the essentials of video study, a proven method to enhance your mathematics instruction through iterative lesson design at a pace that matches your busy schedule. Topics include satisfying legal hurdles for classroom videotaping, tips and technical know-how for better video, and maximizing the use of video for lesson enhancement.
Grade Band Audience: General Interest/All Audiences | Mile High 1 E/F (Convention Center)
11:30-12:00pm

707
Sharing Student Lessons with iBooks Author, iBooks, and an iPad
Speaker: Larry Osthus
See how math lessons were imported into **iBooks Author** to create **iBooks** that focus on sspecific math concepts. An iPad is used to access the lessons in the **iBook**. This is an innovative way for math supervisors, math coaches, and teachers to share lessons. You will have access to an **iBook** containing sample lessons.
Grade Band Audience: *3 to 5, PreK to 2* | Four Seasons 4 (Convention Center)

710
Skyping Problem-Solving Tasks to Improve Fraction Instruction
Speaker: Kim Hartweg and Bob Mann
Skype technology connected a fifth-grade classroom with preservice teachers to complete fraction problem-solving tasks. These tasks align with the grades 3–5 fraction progressions and mathematical practices for the Common Core State Standards. We will share the process and results involving students' ability to decompose fractions.
Grade Band Audience: Preservice and Inservice, 3 to 5 | 403/404 (Convention Center)

716
Alternative and Creative Assessments in the Math Classroom
Speakers: Michelle Neely and Melissa Archey
We will present various ways to assess students creatively. Going beyond simply grading homework or giving quizzes and tests, we will explore links to art, history, writing, and **technology**. We will also present ways to administer standard quizzes and exams creatively. Spend thirty minutes with us to discover some new assessment ideas.
Grade Band Audience: *9 to 12, 6 to 8* | 506/507 (Convention Center)

717
Effective Use of Virtual Manipulatives: Ready to Create Your Own?
Speakers: S. Asli Ozgun-Koca, Michael Meagher and Michael Todd Edwards
Can you touch a line? **Virtual manipulatives** have different capabilities to offer that traditional counterparts cannot. Explore well-established websites of virtual manipulatives and what those websites have to offer you. We will also share a virtual manipulative that we created using **GeoGebra**.
Grade Band Audience: *9 to 12, 6 to 8* | Mile High 1 A/B (Convention Center)

722
Tilings and Tessellations: Using Geometer's Sketchpad for Investigation and Proof
Speakers: Melissa McAninch, Taehoon Choi and Laurentius A. Susadya
Explore translation, reflection, and the merge feature in The **Geometer's Sketchpad** to create tilings and tessellations. See how to use geometric concepts in conjunction with Sketchpad to create a lesson that stimulates investigation and ideas for proof about tessellation in the Euclidean plane.
Grade Band Audience: Preservice and Inservice, 9 to 12 | 708/710/712 (Convention Center)

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Viral Math Videos: A Hart-to-Hart Conversation
Speakers: Vi Hart and George Hart
Father and daughter, George and Vi Hart make videos in their own styles with the common goal of showing real, awesome, beautiful math. Vi learned some math from George, and George learned about videos from Vi, and you can learn how they create content that educates, inspires, and makes people want to share.
Grade Band: General Interest/All Audiences | Four Seasons 2/3 (Convention Center)