



Come learn.
Go teach.

2017 T³™ International Conference

March 10-12, 2017, Chicago, Illinois

#T3IC

[T³™ Professional Development]

Instructional practices | Technology integration | Content knowledge





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Friday Session Details	3
Saturday Session Details	29
Sunday Session Details	61
Presenter Index	63

A stylized, light-colored graphic of a city skyline with various building shapes, positioned behind the main text.

*Come learn.
Go teach.*

#T3IC

Friday Session Details

Deep practice: building conceptual understanding in the middle grades

TI-Nspire™ CX Teacher Software

Jill Gough, Atlanta, Georgia, United States

Jennifer Wilson, Brandon, Mississippi, United States

How might we attend to comprehension, accuracy, flexibility and then efficiency? What if we leverage technology to enhance our learners' visual literacy and make connections between words, pictures and numbers? In this session, we will look at new ways of using technology to help learners visualize, think about, connect and discuss mathematics. Let's explore how we might help young learners productively struggle, instead of thrashing around blindly.

10 – 11:30 a.m.

Dusable
West Tower, Third Floor

90-minute hands-on
All levels
Middle Grades Math

Scripting with Lua from the ground up

TI-Nspire™ CX Teacher Software

Bryson Perry, Lexington, Kentucky, United States

Come learn the basics of Lua programming from the ground up. Basics of the Lua Script Editor and basic coding techniques will be explored in this session. No Lua programming knowledge is necessary, but familiarity with TI-Nspire™ CX Student Software or TI-Nspire™ CX Teacher Software is strongly recommended.

10 – 11:30 a.m.

Field
West Tower, Third Floor

90-minute hands-on
Intermediate
Coding

Multiple tools for multiple modalities of learning – for young mathematicians

TI-15 Explorer™ elementary calculator

Tammy Jones, Lebanon, Tennessee, United States

Developing number sense is foundational for beginning mathematicians in the primary years. Participants will see how using multiple modalities of learning supports the development of deeper understandings and building fluency. Participants will engage with multiple tools of investigation as they experience an activity focused around building numeracy. The tools used will include the 100 chart, a piece of children's literature, manipulatives and the TI-15 Explorer™ elementary calculator.

10 – 11:30 a.m.

Horner
West Tower, Third Floor

90-minute hands-on
All levels
Elementary Math

Building Nspired-thinking classrooms

TI-Nspire™ CX CAS technology

Tom Steinke, Ottawa, Ontario, Canada

Paul Alves, Brampton, Ontario, Canada

In this session, the presenters will share and model what teaching and learning in a 360-degree classroom looks, sounds and feels like. Vertical Non-Permanent Surfaces (VNPS), Visibly Random Groups (VRG) and research ideas from Dr. Peter Liljedahl – when implemented with TI-Nspire™ CX technology – create an incredibly powerful and connected learning community in the math classroom. Student thinking is visible and actionable, where teachers can react in real time to help keep individuals and groups in a state of flow. The presenters will lead participants through rich activities that model these ideas, as well as share video of classroom episodes that we will critically unpack and analyze.

10 – 11:30 a.m.

Ogden
West Tower, Third Floor

90-minute hands-on
All levels
Formative Assessment

My TI-84 Plus Silver Edition graphing calculator can predict the weather?

TI-84 Plus Silver Edition graphing calculator

Bill Kujawa, Brookfield, Wisconsin, United States

Tim Owen, Brookfield, Wisconsin, United States

Many of us begin our day by looking outside and asking ourselves, “What will the weather be like today?” Join us as we investigate the relationship between the path our planet takes each year and its effect on the weather we experience each day. Beginning with just a TI-84 Plus Silver Edition and some basic climatology data, we will use regression to create an equation that predicts the weather for various cities across the globe.

10 – 11:30 a.m.

**Wright
West Tower, Third Floor**

90-minute hands-on
Intermediate
Trigonometry

Parametrics activities: building a common strand through precalculus topics

TI-Nspire™ CX CAS technology

Michael Caines, Chicago, Illinois, United States

Scott Galson, Chicago, Illinois, United States

It's time to rethink those families of functions by starting each unit with parametric modeling. We'll share various activities that involve collecting, analyzing and modeling data with TI-Nspire™ CX technology. These scenarios will engage you and your students in the process of using technology – and CAS, specifically – in genuine problem solving.

10 – 11:30 a.m.

**Addams
West Tower, Third Floor**

90-minute hands-on
Intermediate
CAS

The spirit of innovation

TI-84 Plus CE graphing calculator

John Hanna, Hopatcong, New Jersey, United States

Marc Garneau, Surrey, British Columbia, Canada

Introduce your students to the invention process using the new TI-Innovator™ Hub with TI LaunchPad™ Board development tool. This easy-to-use device is fun and rewarding. No experience is necessary; bring your curiosity and prepare to be inspired.

10 – 11:30 a.m.

**Gold Coast
West Tower, Concourse Level**

90-minute hands-on
All levels
Coding and STEM

Show me the data

TI-Nspire™ CX Navigator™ System

Andi Parr, Temple, Texas, United States

Calculator-Based Ranger™ (CBR™) motion sensors, temperature probes and the TI-Nspire™ CX Navigator™ System, oh my! Come learn how to support your students as they collect and decipher data. We will explore a variety of rich tasks applicable to middle grades and high school classrooms.

10 – 11:30 a.m.

**Water Tower
West Tower, Concourse Level**

90-minute hands-on
Beginner
General Math

Making the math-science connection through rates of change and TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Daniel Wilkie, Piedmont, South Carolina, United States

Rachael Gorsuch, Gahanna, Ohio, United States

Stacy Thibodeaux, Lafayette, Louisiana, United States

Making connections and meaningful conversations can be created with the help of TI-Nspire™ CX technology. In this session, science and math teachers come together to collaborate on the concept of rates of change – using data collection from a science and statistics perspective – while analyzing it through the lens of an algebra I or algebra II teacher.

10 – 11:30 a.m.

**Columbian
West Tower, Concourse Level**

90-minute hands-on
Intermediate
STEM/Connecting Science
and Math

The TI-84 Plus CE graphing calculator + 10 Minutes of Code + TI-Innovator™ Hub with TI LaunchPad™ Board = STEM career curiosity

TI-84 Plus CE graphing calculator

Terrance Mankus, Chicago, Illinois, United States

Margo Lynn Mankus, Beacon, New York, United States

STEM hides everywhere – let’s help students find it! In this session, we’ll write TI Basic code to control the calculator beyond the built-in functions. Next, using this coding power, we’ll write code to control blinking LEDs, sound and more using the TI-Innovator™ Hub. Give your students a springboard to STEM career curiosity! Using STEM career-related videos to kick off the coding experiences, this classroom structure can be used for class warm-ups over several days.

10 – 11:30 a.m.

**Picasso
West Tower, Concourse Level**

90-minute hands-on
All levels
Coding and STEM

Forensic science: using technology as an effective tool

TI-84 Plus CE graphing calculator

Jacklyn Bonneau, North Grosvenor, Connecticut, United States

Louise Chapman, Deland, Florida, United States

In this session, several activities will be done in the field of forensics science – some will use sensors and some will not. Directions for both the TI-84 Plus CE graphing calculator and TI-Nspire™ CX handheld will be given, so that participants can use the technology that best fits their individual classroom.

10 – 11:30 a.m.

**Haymarket
West Tower, Concourse Level**

90-minute hands-on
Beginner
General Science

Using 3-D graphing on TI-Nspire™ CX technology to create solids of revolution

TI-Nspire™ CX Navigator™ System

Steve Phelps, Cincinnati, Ohio, United States

Participants will take advantage of the 3-D graphing capabilities of TI-Nspire™ CX technology to create beautiful solids of revolutions. In this session, you will learn how to create solids of revolution by rotating functions around the x-axis or the y-axis. You will also be shown how to add sliders to bring these solids of revolution to life! In addition, you will learn how to modify colors to display gradients and heights. If you teach calculus, this is a “must attend” session.

10 – 11:30 a.m.

**Wrigley
West Tower, Concourse Level**

90-minute hands-on
All levels
Calculus

To engage your students, bring TI-Nspire™ CX technology programming into your classroom

TI-Nspire™ CX Navigator™ System

Amin Lalani, Richardson, Texas, United States

Participants in this session will learn how to create short programs on TI-Nspire™ CX technology. We will begin with the “hello world” activity, and quickly move to creating the following programs:
1. Determining if an integer is even or odd using modular arithmetic, 2. Using a loop to create two lists – with one list containing all even numbers and the other containing all odd numbers, and
3. Creating a program to find the hypotenuse of a right triangle.

10 – 11:30 a.m.

**Hong Kong
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Coding

Using the TI-Nspire™ CAS App for iPad® to explore a rich task in precalculus

TI-Nspire™ CAS App for iPad®

Art Mabbott, Woodinville, Washington, United States

In this session, we will explore a sinusoidal function using technology to build a graph, define an equation and assess our understanding of a real-world situation. How do we know our answer is correct?

10 – 11:30 a.m.

**Acapulco
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Precalculus

Getting started with the TI-Nspire™ App for iPad®, and more

TI-Nspire™ CAS App for iPad®

Jerry Scherer, Thornhill, Ontario, Canada

In this hands-on session, participants will be introduced to the basic features of the six applications of the TI-Nspire™ App for iPad® (utilizing the latest OS). These interactive tutorial documents engage students in problem-solving tasks (with instructions, solutions and keystroke sequences provided). Come to this session to receive the Getting Started documents for the TI-Nspire™ App for iPad®.

10 – 11:30 a.m.

**Toronto
West Tower, Ballroom Level**

90-minute hands-on
Beginner
General Interest

Deepening understanding of center and spread in statistics

TI-Nspire™ CX Navigator™ System

Kyle Atkin, Bakersfield, California, United States

David Reeves, Orangevale, California, United States

Coherence is important in mathematics. Come experience dynamic TI-Nspire™ CX technology lessons from the free Building Concepts series. We'll explore building an understanding of mean as a fair share and balance point to a distribution, as well as use it to build an understanding of spread. This session will focus on: 1. Connecting statistical relationships through a coherent story within and across grades six, seven and eight, 2. Leveraging TI-Nspire™ CX technology to enhance visualization in support of learning and developing concepts, and 3. Implementing effective teaching practices to support developing concepts.

10 – 11:30 a.m.

**Atlanta
West Tower, Ballroom Level**

90-minute hands-on
All levels
Statistics

Slide, turn and flip

TI-84 Plus CE graphing calculator

Jean McKenny, Derby, Vermont, United States

The Common Core State Standards for geometry state that "The concepts of congruence, similarity and symmetry can be understood from the perspective of geometric transformation." This session will present some creative ways and learning activities to use technology to help middle and high school students better understand how these rigid motions (isometries) can be used (alone or in combination) to more fully understand these concepts.

10 – 11:30 a.m.

**San Francisco
West Tower, Ballroom Level**

90-minute hands-on
All levels
Geometry

Activities and strategies for teaching mathematics with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Ruth Casey, Frankfort, Kentucky, United States

Margaret Bambrick, Deland, Florida, United States

Join us as we explore concepts from algebra to precalculus. We will use multiple representations in activities designed to deepen students' understanding of mathematical topics, including linear functions, systems of equations, transformations, zeroes of polynomials, mathematical modeling and more. Come see how using photographs and images with the TI-84 Plus CE can help make real-world connections to the mathematics in your classrooms.

10 – 11:30 a.m.

**Michigan 1B
East Tower, Concourse Level**

90-minute hands-on
Beginner
Algebra I

Basics of the TI-Nspire™ CX Navigator™ System

TI-Nspire™ CX Navigator™ System

Gina Allred, Ramseur, North Carolina, United States

Come explore the basic uses of the TI-Nspire™ CX Navigator™ System – with TI-Nspire™ CX technology – in an algebra I classroom. Attendees will explore basic uses for warm-ups, lesson enhancements and exit tickets, and will view easy ways to integrate this exciting technology into any lesson.

10 – 11:30 a.m.

**Michigan 1C
East Tower, Concourse Level**

90-minute hands-on
Beginner
Algebra I

How many ways are there for solving these great problems?

TI-84 Plus CE graphing calculator

Ron Lancaster, Toronto, Ontario, Canada

Participants in this session will consider the benefits for students when they solve a problem using different ways for setting it up. Picture your students revisiting the same problem over time using algebra, geometry, trigonometry, calculus and technology. Imagine them exploring the dynamic relationship between the solution of a problem and its initial conditions.

10 – 11:30 a.m.

Michigan 2
East Tower, Concourse Level

90-minute hands-on
Beginner
Algebra II

Simulations for algebra through precalculus using the TI-84 Plus Silver Edition graphing calculator

TI-84 Plus Silver Edition graphing calculator

Sister Alice Hess, I.H.M., Philadelphia, Pennsylvania, United States

Ray Klein, Glen Elyn, Illinois, United States

The use of simulation as a tool to lead students to higher-order thinking is the focus of this session. Participants will experience several activities which have been successfully used with students – from pre-algebra through precalculus. They include geometric and binomial probability, etc.

10 – 11:30 a.m.

Michigan 3
East Tower, Concourse Level

90-minute hands-on
Intermediate
Algebra II

Modeling and quantitative reasoning activities on the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Gregory Foley, Athens, Ohio, United States

John Ashurst, Baxter, Kentucky, United States

Attendees will use the TI-84 Plus CE to explore number and quantity; statistics and probability; and modeling using algebra and geometry. The National Council of Teachers of Mathematics says, "Every student should study mathematics every year through high school, progressing to a more advanced level each year." This session will involve participants in rich problems that typical seniors find engaging – problems that connect a wide range of mathematics, statistics and modeling – and that leverage mathematical action, technology, thinking and discourse.

10 – 11:30 a.m.

Columbus CD
East Tower, Ballroom Level

90-minute hands-on
Intermediate
General Math

TI-Nspire™ CX technology for beginners

TI-Nspire™ CX technology

Hugh Daniels, Yelm, Washington, United States

Are you new to TI-Nspire™ CX technology? Come to this session to learn the basics of the TI-Nspire™ CX handheld. You'll learn the basics of the Calculator, Graphs, Geometry, Notes, Lists & Spreadsheets, and Data & Statistics pages. Learning the basics will give you a great head start for the rest of the conference.

10 – 11:30 a.m.

Columbus EF
East Tower, Ballroom Level

90-minute hands-on
Beginner
General Math

How the TI-Nspire™ CX Navigator™ System changed the way I teach and assess my students

TI-Nspire™ CX Navigator™ System

Christine Bickett, Shepherdsville, Kentucky, United States

New to the TI-Nspire™ CX Navigator™ System? Come discover how the TI-Nspire™ CX Navigator™ System can encourage all of your students to have a voice in the classroom, while at the same time allowing you to formatively assess their progress. Become familiar with the question writing options, Quick Poll features and assessment opportunities. Learn to easily prepare questions in advance to send to students during the lesson; how to use the Screen Capture for accountability and providing assistance; and how to use the Live Presenter to allow students to lead discussions and share their work. Come see why I never want to teach without this technology.

10 – 11:30 a.m.

Columbus G
East Tower, Ballroom Level

90-minute lecture/demonstration
Beginner
Formative Assessment

Captivating review ideas students can't resist

TI-Nspire™ CX Navigator™ System

Lynn Adsit, Mercer Island, Washington, United States

Kim Schjelderup, Mercer Island, Washington, United States

Is review time a deadly bore for you and your students? Stop the yawns and put an end to indifference. Add a little gamification to your review time and you will be surprised at the positive results. In this session, you'll get and give ideas to spice up reviews, revive interest and ensure retention. Together, we will explore both tech and non-tech strategies that are sure to guarantee engagement for every student, for any type of review setting.

10 – 11:30 a.m.

**Columbus H
East Tower, Ballroom Level**

90-minute lecture/demonstration
All levels
General Interest

Sharing TI-84 Plus CE graphing calculator upgrades to excite your students

TI-84 Plus CE graphing calculator

Allister Wadden, Annapolis Royal, Nova Scotia, Canada

As you complete a series of work stations in this session, you'll explore the current upgrades to the TI-84 Plus CE. We'll also explore how those upgrades will help your students achieve success in learning.

10 – 11:30 a.m.

**Columbus IJ
East Tower, Ballroom Level**

90-minute hands-on
Intermediate
General Interest

Is it conceptual understanding or procedural fluency: what every math teacher and parent wants to know

Tim Kanold, Lodi, California, United States

Matt Larson, Lincoln, Nebraska, United States

Based on their best-selling 2016 book, "Balancing the Equation," co-authors and mathematics education leaders Dr. Matt Larson and Dr. Timothy Kanold will bring their sense of humor to a serious topic about the state of mathematics education today. They will provide a concise, 200-year journey of mathematics education belief swings and debunk the myth around the "Tyranny of the OR" that has held the procedural fluency and conceptual understanding of mathematics captive for far too long. They will also highlight important parental messages and essential actions with the school community – about the teaching and learning of mathematics – that are needed if the cultural activity for engaging in mathematics is to change for the graduating class of 2029. The presenters will challenge each and every educator and parent to stop the pendulum from swinging too far ever again, and will offer some practical tips for how to get it done.

10 – 11:30 a.m.

**Columbus KL
East Tower, Ballroom Level**

90-minute lecture
All levels
General Interest

Resources galore and more

TI-Nspire™ CX technology

Susan Riker, Kalamazoo, Michigan, United States

Karen Cockburn, Spokane, Washington, United States

In this session, participants will explore the education.ti.com website with two experienced teachers. Come investigate the excellent, teacher-friendly resources to be found there, including how to find activities for all types of handhelds and content; learning to code; Building Concept activities; and much more.

12:45 – 1:45 p.m.

**Dusable
West Tower, Third Floor**

60-minute lecture/demonstration
All levels
General Interest

An inspired solution to the 2012 AP* Calculus BC No. 4 problem

TI-Nspire™ CX Teacher Software

John Cocharo, Arlington, Texas, United States

Attendees will participate in a demonstration utilizing TI-Nspire™ CX Teacher Software to solve the 2012 AP* Calculus BC Exam problem No. 4. The TI-Nspire™ CX handheld can be used to solve various types of problems involving slope fields, Riemann sums, integration, Euler's method and tangent lines. A solution to the 2012 AP* Calculus BC No. 4 problem will be given; a second, similar problem will be provided; and the solution will be given in the session using TI-Nspire™ CX Teacher Software.

12:45 – 1:45 p.m.

Field
West Tower, Third Floor

60-minute hands-on
Advanced
Calculus

Be a “true blue” follower of the TI-15 Explorer™ elementary calculator

TI-15 Explorer™ elementary calculator

Marsha Burkholder, Columbus, Ohio, United States

Chris Ruda, Miami, Florida, United States

In this hands-on elementary workshop, participants will explore math tasks using the TI-15 Explorer™ calculator. Concepts will range from third grade to fifth grade. After this workshop, you will be a “true blue” follower of the TI-15 Explorer™ calculator.

12:45 – 1:45 p.m.

Horner
West Tower, Third Floor

60-minute hands-on
Beginner
Elementary Math

Using TI-Nspire™ CX technology to mimic on-line assessments

TI-Nspire™ CX technology

Ronda Davis, Albuquerque, New Mexico, United States

Pareesa Shirazi, Albuquerque, New Mexico, United States

Don't want to take time out of the classroom to prepare your students for on-line assessments like the Partnership for Assessment of Readiness for College and Careers (PARCC) or Smarter Balanced Assessment Consortium (SBAC)? You don't have to! Learn how your TI-Nspire™ CX Navigator™ System can be used to give students ongoing practice for both the Content and Technology expectations of the computer-based Common Core State Standards (CCSS) assessments. We will look at the various online question types and see how those questions are mimicked – using TI-Nspire™ CX technology – to help you provide ongoing practice for the Common Core State Standards Mathematics. Walk away with past-released items already made into .tns files, and leave with .tns question templates that can be used daily to prepare students for sixth through 12th grade PARCC or SBAC assessments.

12:45 – 1:45 p.m.

Ogden
West Tower, Third Floor

60-minute hands-on
All levels
Assessment

STEM activities with sinusoidal functions and TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Jeff Corn, Cincinnati, Ohio, United States

In this session, we will be exploring sinusoidal functions using real-time data from three different STEM-related websites. These are classroom activities that can be completed in one class period – with TI-Nspire™ .tns files and student created applications available for sharing.

12:45 – 1:45 p.m.

Wright
West Tower, Third Floor

60-minute hands-on
Intermediate
Precalculus

Small steps ensure student success

TI-Nspire™ CX CAS technology

Anthony Farrell, Philadelphia, Pennsylvania, United States

Students come to school carrying powerful handheld technology with their phones each day, yet they enter mathematics classrooms to use old, or no, technology. Come to this session to see how the TI-Nspire™ CX CAS handheld and software supports student learning in mathematics. Examples from algebra, calculus and statistics will be demonstrated. Students using this technology have advantages in learning and showing mathematical knowledge. Come see why your students could succeed with this technology.

12:45 – 1:45 p.m.

Addams
West Tower, Third Floor

60-minute lecture/demonstration
All levels
CAS

The use of CAS in exams

TI-Nspire™ CX CAS technology

Helmut Heugl, Stockerau, Austria

In the first part of the lecture, frameworks like the National Council of Teachers of Mathematics Standards and German or Austrian Competence Models for Standards will be presented. The lecture will continue by investigating the influence of CAS in the quality and structure of exams (written exams in the classroom as well as final exams). Exams in countries where CAS tools are admitted will be compared with exams in countries where CAS is forbidden. Examples of exams in countries like Norway, Denmark, Germany, Austria, Australia and the USA will be compared. Generally, the influence of tests in the quality and the output of the educational process will be discussed, and changes caused by the use of CAS in teaching, learning and testing will be demonstrated.

12:45 – 1:45 p.m.

**McCormick
West Tower, Third Floor**

60-minute lecture
All levels
CAS

The power in the palm of your hand

TI-84 Plus CE graphing calculator

John Hanna, Hopatcong, New Jersey, United States

Marc Garneau, Surrey, British Columbia, Canada

Math and science teachers, you can tap the rich and rewarding world of computer programming using the graphing calculators already in your classroom. The TI-84 Plus family of graphing calculators has a rich and robust built-in programming language that is powerful and yet easy to use. Come and learn to tap into that Power (with a capital 'P') in the 2017 edition of this session. We will be focusing on the TI-84 Plus CE graphing calculator, and adapting programs for both TI-84 Plus and TI-84 Plus CE handhelds.

12:45 – 1:45 p.m.

**Gold Coast
West Tower, Concourse Level**

60-minute hands-on
All levels
Coding and STEM

STEM investigations for the math classroom – engage students and have fun

TI-Nspire™ CX technology

Betty Gasque, Charleston, South Carolina, United States

Jeff Lukens, Sioux Falls, South Dakota, United States

Why should students only experience hands-on learning for STEM in their science classes? Learn how to bring inquiry-based learning into your classroom using investigations that allow students to reason mathematically, solve problems and explore concepts in real contexts. We'll also discuss how STEM investigations can be used to gain insight into students' thinking, and to engage them in rich mathematics discussions.

12:45 – 1:45 p.m.

**Water Tower
West Tower, Concourse Level**

60-minute hands-on
Beginner
STEM/Connecting Science
and Math

Investigation and inquiry in STEM fields

TI-84 Plus Silver Edition graphing calculator

Caroline Smith, Fairfield, Connecticut, United States

This workshop will help educators encourage students to ask questions and consult sources – instead of simply receiving information. Using investigation strategies, students must find, analyze, and evaluate information, sources or data; in this way, classrooms are transformed into student-centered and student-driven workspaces.

12:45 – 1:45 p.m.

**Columbian
West Tower, Concourse Level**

60-minute hands-on
All levels
STEM/Connecting Science
and Math

Coding Mondays in every class – no experience needed

TI-Nspire™ CX Navigator™ System

Robyn Poulsen, Lake Placid, New York, United States

Tammy Casey, Lake Placid, New York, United States

Coding is an essential 21st-century skill. The flipped classroom has allowed us to incorporate coding into all of our classes on Mondays, and continue to preserve "No Homework Weekends." Participants will be actively engaged in TI's 10 Minutes of Code activities in the same progression as my students. In addition to learning how to code on your TI-Nspire™ CX technology, we will have a discussion of the ins and outs of the flipped classroom, as time permits. Bring your own laptop with TI-Nspire™ CX software installed.

12:45 – 1:45 p.m.

**Picasso
West Tower, Concourse Level**

60-minute hands-on
Beginner
Coding and STEM

Getting over graphs in the science classroom with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Jessica Kohout, Fulton, Maryland, United States

Leann Iacuone, Riverside, California, United States

Many science students have difficulty with analyzing and interpreting graphs. These skills are needed for students to be successful in everything – from today’s standardized tests to college and career readiness. In this session, participants will learn techniques to engage students in the creation and interpretation of multiple types of graphs used in the science classroom. Participants will use easy and quick data collection activities to help students develop an understanding of graphical analysis. With practice, you can develop ways to spark conversations among your students about data – in that, no matter the result, the data can tell you a great deal about an experiment.

12:45 – 1:45 p.m.

Haymarket
West Tower, Concourse Level

60-minute hands-on
Beginner
General Science

My favorite TI-Nspire™ CX Teacher Software files for teaching calculus

TI-Nspire™ CX Teacher Software

Patrick Mara, Pueblo, Colorado, United States

You don’t need a classroom set of TI-Nspire™ CX handhelds in order to give your students a visual representation of important calculus concepts. With the TI-Nspire™ CX Teacher Software and a media projector, you can share dynamic files that illustrate concepts in both differential and integral calculus – at the AP* AB and BC level – in two and three dimensions. Participants will be given a folder with 35 TI-Nspire™ CX Teacher Software demonstrations.

12:45 – 1:45 p.m.

Wrigley
West Tower, Concourse Level

60-minute lecture/demonstration
All levels
Calculus

Creating screencasts for the TI-84 Plus CE graphing calculator and TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Denny St. John, Mount Pleasant, Michigan, United States

Join this session to learn how to use the characteristics of worthwhile screencasts for the TI-84 Plus CE graphing calculator and TI-Nspire™ CX handheld. Your audience for these screencasts includes your students and their parents; your colleagues; and local school administrators. Please bring a laptop with the software pre-installed: screencast software, the TI Connect™ CE software application and/or TI-SmartView™ Emulator Software for the TI-84 Plus graphing family.

12:45 – 1:45 p.m.

Hong Kong
West Tower, Ballroom Level

60-minute hands-on
Intermediate
Authoring

Building Concepts: ratios and proportional reasoning

TI-Nspire™ App for iPad®

Daniel Ilaria, Chester Springs, Pennsylvania, United States

Michelle Rinehart, Midland, Texas, United States

In this session, participants will deepen their understanding of ratios by examining alternative ways to think about solving ratio problems. We will use tables to explore the additive and multiplicative properties of ratios.

12:45 – 1:45 p.m.

Acapulco
West Tower, Ballroom Level

60-minute lecture/demonstration
All levels
Middle Grades Math

Euler’s enduring understandings: AP* Calculus’ Big Ideas, technology and “e”

TI-Nspire™ CAS App for iPad®

Stephanie Ogden, Knoxville, Tennessee, United States

Pi is relatively accessible to students, but deep understanding of “e” often eludes even advanced students. Participants in this session will sample technology-based lessons exploring e through the lenses of AP* Calculus’ Big Ideas. Activities for early in the year will help students to connect algebra II understandings of continuous compounding with limits, derivatives and L’Hopital’s Rule. Graphing and numerical activities for mid-year will help students to use accumulation of area and the Fundamental Theorem of Calculus to improve understandings of e. Wrapping up with historical series for e, we hope that participants will be able to help their students to develop enduring understandings and deep appreciation for Euler’s beautiful number.

12:45 – 1:45 p.m.

Toronto
West Tower, Ballroom Level

60-minute lecture/demonstration
All levels
Calculus

Statistical simulations with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Don Worcester, Winter Park, Florida, United States

In this session, participants will learn how to use TI-Nspire™ CX technology to effectively use simulations in their statistics classes.

12:45 – 1:45 p.m.

Atlanta
West Tower, Ballroom Level

60-minute hands-on
All levels
Statistics

Creating constrained mathematical environments for understanding topics from middle school mathematics

TI-Nspire™ CX Teacher Software

Wade Ellis, San Jose, California, United States

The Common Core State Standards Mathematics (CCSSM) provides an opportunity to create short, dynamic and interactive programs that students can use to understand mathematical concepts. The Progressions documents associated with these standards provide an order for the presentation of the topics in the standards. This presenter will discuss a framework for creating dynamic and interactive TI-Nspire™ CX documents, and also demonstrate the student use of several such documents from the Expressions and Equations module of the CCSSM.

12:45 – 1:45 p.m.

San Francisco
West Tower, Ballroom Level

60-minute lecture/demonstration
Intermediate
Middle Grades Math

TeacherTube® LLC – organizing your media

Adam Smith, Frisco, Texas, United States

Let's get organized! This session will explore how you can organize the media in your classroom for a more engaged approach that your students, parents and fellow educators will love. Our goal is to provide an online community for sharing instructional videos, and we seek to fill the need for a more educationally-focused and safe venue for teachers, schools and home learners. TeacherTube® LLC provides anytime, anywhere professional development, based on a format of teachers educating other teachers. It's also a site where teachers can post videos designed for students to view, in order to learn a concept or skill.

12:45 – 1:45 p.m.

New Orleans
West Tower, Ballroom Level

60-minute lecture/demonstration
Beginner
General Interest

Game of phones: engaging middle school lessons

TI-Nspire™ CX technology

Maria Benzon, Houston, Texas, United States

Combining the popularity of the show "Game of Thrones" with the popularity of mobile apps, participants will explore a few lessons focused on middle grades math concepts and innovative integration with TI-Nspire™ CX technology, along with the use of popular mobile apps.

12:45 – 1:45 p.m.

Michigan 1A
East Tower, Concourse Level

60-minute hands-on
Beginner
Middle Grades Math

Analyze, compare and choose – making informed consumer decisions in the real world

TI-Nspire™ CX Navigator™ System

Nancy McMahon, Churchville, New York, United States

Bombarded by persuasive advertisements and misleading social media posts, today's students are vulnerable consumers. In this session, I will share consumer product analysis activities that will help students build consumer decision-making and STEM skills through high interest scenarios. Using basic TI technology and simple tools to gather data, participants will engage in hands-on investigations of real-world consumer scenarios. This session focuses on functions and functional analysis skills that students need in order to build the analytical skills to make adequate comparisons in the real world through algebra. Participants will walk away with ready-to-use activities.

12:45 – 1:45 p.m.

Michigan 1B
East Tower, Concourse Level

60-minute hands-on
Beginner
Algebra I

Quadratics 101 using the TI-84 Plus family of graphing calculators

TI-84 Plus CE graphing calculator

Vicki Cable, Langley, Washington, United States

Roots, solutions and factors – so much info, so little time. This session will incorporate best practices using the TI-84 Plus family of graphing calculators and conceptual understandings of quadratic functions for the algebra I student. This will be a hands-on workshop, and factoring, finding roots, axis of symmetry, and max and min – using graphing and tables on the calculator – will be shared and explored. Problem solving activities and formative assessments will be investigated by participants.

12:45 – 1:45 p.m.

Michigan 1C
East Tower, Concourse Level

60-minute hands-on
All levels
Algebra I

Composition and inverses with quadratic functions

TI-84 Plus CE graphing calculator

Fred Decovsky, Millburn, New Jersey, United States

In this session, we will look at the following ideas and make connections between symbolic, graphical and numerical representations using the TI-84 Plus family of graphing calculators:
1. Exploring the composition of functions, including domain and range, 2. Finding inverse functions and relations, 3. Graphing a function with a restricted domain and graphically confirming its inverse, and 4. Graphing inverses parametrically. We will also discuss strategies for effectively incorporating technology into the classroom.

12:45 – 1:45 p.m.

Michigan 2
East Tower, Concourse Level

60-minute hands-on
Intermediate
Algebra II

An Nspired look at transformations in algebra

TI-Nspire™ CX technology

Landy Godbold, Atlanta, Georgia, United States

Many activities help students infer what multiplications and additions to – or “inside” functions – accomplish. This session won’t do any of that. Instead, we will “crawl under the hood” of transformations and discover what makes them tick. Now you’ll have an answer when students say, “I see what it’s doing, but WHY does it work like that?” We will use our feet (for real!) along with TI-Nspire™ CX technology for spreadsheets, dynamic mapping diagrams and more. Learn how to build and interpret “any” sequence of “any” number of transformations of “any” kind! Come wow and amaze your friends.

12:45 – 1:45 p.m.

Michigan 3
East Tower, Concourse Level

60-minute lecture/demonstration
All levels
Algebra II

Technology in the updated AP* Calculus classroom

TI-Nspire™ CX CAS technology

Vicki Carter, Florence, South Carolina, United States

The updated AP* Calculus course includes a new curriculum framework that ties course content and mathematical practices to clearly stated learning objectives. How do these mathematical practices for AP* Calculus define instruction? How are they related to the conceptual understanding of calculus? What is the role of technology in the new curriculum framework? This session will explore these topics.

12:45 – 1:45 p.m.

Columbus CD
East Tower, Ballroom Level

60-minute hands-on
Intermediate
Calculus

Flipping out in your classes using TI-Nspire™ CX CAS technology

TI-Nspire™ CX CAS technology

Juan de la Cruz, Sherman Oaks, California, United States

In this session, participants will leverage TI-Nspire™ CX technology to maximize teaching using the flipped classroom format. Elements of the flipped classroom will be introduced and TI-Nspire™ CX technology will be used as a tool to enhance student understanding under this teaching format. Participants will be introduced to the power of quick polls as a formative assessment tool to gauge student understanding in real time. We will also examine how the marriage of TI-Nspire™ CX technology with the flipped classroom format can improve student learning and outcomes.

12:45 – 1:45 p.m.

Columbus EF
East Tower, Ballroom Level

60-minute lecture/demonstration
All levels
General Math

Transformational geometry – immediate interactive engaging investigations

TI-Nspire™ CX technology

Tom Reardon, Poland, Ohio, United States

Students discover the geometry in less than 15 seconds! In this session, you'll get hands-on experience and have your students Play-Investigate-Explore-Discover the geometric properties of reflections, translations, rotations and dilations. Using a handheld, iPad® or computer software, students will become engaged quickly and deeply in the activity. Obtain hands-on experience on how to implement the investigations in your classroom, and get a free and complete unit of student and teacher materials for grades eight through 10. There are over 30 creative and interactive activities that can be done individually on TI-Nspire™ CX handhelds, or as a demonstration using TI-Nspire™ CX software for the entire class. Utilized are compass and straightedge; inductive and deductive reasoning; problem solving strategies; interactive technology; and pedagogy.

12:45 – 1:45 p.m.

**Columbus G
East Tower, Ballroom Level**

60-minute hands-on
Beginner
Geometry

Deep and powerful mathematics – encouraging students to think

TI-Nspire™ CX CAS technology

Jim Lowe, Kelvin Grove, Australia

Many traditional classroom activities focus on the application of a rule or procedure to find an answer. Often, the technique required is clearly evident in the question or exercise – necessitating little thinking from the student. This session will explore some techniques – incorporating TI-Nspire™ CX technology – to turn routine activities into opportunities for deeper thinking, and also embed some powerful mathematical ideas. The activities included in the presentation range from calculations with fractions and solving linear equations, and extend to the properties of quadratic functions. In each case, the technology is used to provide the stimulus for deeper mathematical investigation, rather than as a means of obtaining a solution.

12:45 – 1:45 p.m.

**Columbus H
East Tower, Ballroom Level**

60-minute hands-on
All levels
General Interest

High-stakes testing – help! The TI-84 Plus CE graphing calculator to the rescue

TI-84 Plus CE graphing calculator

Beth Smith, Jacksonville, Florida, United States

When students use graphing calculators frequently, they tend to score higher on national-, state- and school-level tests. Efficient use of the TI-84 Plus CE on high-stakes tests – such as the SAT*, ACT*, AP* and IB® exams – can help students achieve their goals. During the school year, the TI-84 Plus CE handheld should be used by students to verify results, make discoveries and see connections. This workshop will cover tips and tricks that will help students effectively use the TI-84 Plus CE on high-stakes tests.

12:45 – 1:45 p.m.

**Columbus IJ
East Tower, Ballroom Level**

60-minute hands-on
All levels
General Interest

Fighting for the C in PLC

Tim Kanold, Lodi, California, United States

When teachers commit to the PLC at Work™ process, they answer the heartprint question: “Are you a person open to influence and shared values, able to be relationally intelligent and work interdependently with others?” In this session, Dr. Timothy D. Kanold will reveal why the C in PLC is worth fighting for: Community is central to student learning and success. Based on his soon-to-be released book: “HEART! Fully Forming Your Professional Life as a Teacher and Leader,” (Solution Tree Press, mid-March 2017), this session will focus on how teachers can build community within their teams and temper self-interest. In building community and tempering self-interest, teachers will unleash their “unselfish gene” – but not to the point where they allow others to take advantage of their work. The presenter will help teachers cut through the noise of work and erase student-learning inequities caused by the teachers’ own isolated behaviors. As they push to improve their relational intelligence, teachers will examine if they are a part of a wise team and learning community. Participants will learn whether they are givers, takers or matchers for their teams, as well as learning which style is most successful. In this session, teachers and leaders will take a deep look at how helping others will drive their own success in the mathematics classroom.

12:45 – 1:45 p.m.

**Columbus KL
East Tower, Ballroom Level**

60-minute lecture
Beginner
General Interest

Tracking in the wild

TI-Nspire™ CX Teacher Software

Adam Pennell, Greensboro, North Carolina, United States

Julie Riggins, Kernersville, North Carolina, United States

Follow us into the wilds of the classroom to track the path of the elusive “flying ball.” You will use “Tracker,” a free video analysis modeling program developed by Douglas Brown, and TI-Nspire™ CX technology to discover and understand this creature’s behavior. Using rare video footage, you will track our “flying ball” to generate its position data. Then back in our home environment of TI-Nspire™ CX technology, you will analyze position and velocity of our quarry; develop models for horizontal and vertical motion; and create parametric models of the flight of this exotic creature.

2 – 3 p.m.

Dusable
West Tower, Third Floor

60-minute hands-on
All levels
STEM/Connecting Science and Math

The flipped classroom with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Tammy Casey, Lake Placid, New York, United States

Robyn Poulsen, Lake Placid, New York, United States

Come see how TI technology can be used in your flipped classroom. We will share what our flipped classrooms look like and offer suggestions that you can use in your classroom.

2 – 3 p.m.

Field
West Tower, Third Floor

60-minute hands-on
All levels
General Math

Exploring the truth behind the trick: investigating “Pick a Number”

TI-15 Explorer™ elementary calculator

Lindsay Gold, Dayton, Ohio, United States

Mike Houston, New Castle, Pennsylvania, United States

Children, as well as adults, can be fascinated by the mind-reading game, “Pick a Number.” Learn the mathematics behind the mystery and how revealing the truth behind the trick can not only foster computational strategies, but give students a deeper understanding of number manipulation. Using the TI-15 Explorer™ elementary calculator, participants will explore how to read someone’s mind with mathematics, and learn how students can use technology to create their own mathematical magic.

2 – 3 p.m.

Horner
West Tower, Third Floor

60-minute hands-on
Beginner
Elementary Math

Using the TI-Nspire™ CX Navigator™ System to formally assess in an AP* classroom

TI-Nspire™ CX Navigator™ System

Damion Beth, Baraboo, Wisconsin, United States

Come to this session to see how I use the TI-Nspire™ CX Navigator™ System platform to build formative assessment into the daily lessons of my AP* classes. We will use the system to model styles of AP* questions, as well as assess ways of linking multiple representations (graphical, numeric, algebraic and verbal) within explorations.

2 – 3 p.m.

Ogden
West Tower, Third Floor

60-minute hands-on
Beginner
Formative Assessment

The joy of parametric equations

TI-84 Plus CE graphing calculator

Debbie Poss, Marietta, Georgia, United States

Don Slater, Marietta, Georgia, United States

Parametric equations are powerful tools for making connections between various concepts in mathematics and science. In this session, we’ll explore how the TI-84 Plus CE graphing calculator helps students visualize them.

2 – 3 p.m.

Wright
West Tower, Third Floor

60-minute lecture/demonstration
Intermediate
Precalculus

Common Core topics for algebra II with the TI-Nspire™ CX CAS handheld and TI-Nspire™ CX Navigator™ System

TI-Nspire™ CX Navigator™ System

Patsy Fagan, Des Moines, Iowa, United States

Mary Moler, Albuquerque, New Mexico, United States

TI-Nspire™ CX CAS technology can be a useful tool to teach the hard-to-teach topics found in the Common Core. They include sequences in List & Spreadsheet and Graphs; graphical representations of non-linear systems; and inverse functions. This session will demonstrate how you can show the visualization of these and other concepts using the TI-Nspire™ CX Navigator™ System – even if your students do not have TI-Nspire™ CX CAS handheld units. This session is for novice and intermediate users.

2 – 3 p.m.

**Addams
West Tower, Third Floor**

60-minute hands-on
Intermediate
CAS

Learning experiences with calculus

TI-Nspire™ CX Navigator™ System

Yew Fook Chan, Singapore, Singapore

In this session, learning activities on how students can investigate, inquire, learn and understand the basic concepts of the derivative – from first principles and the concept of the gradient function – will be shared with participants. Further activities on the idea of convergence of limits may also be discussed and shared.

2 – 3 p.m.

**McCormick
West Tower, Third Floor**

60-minute hands-on
Beginner
Calculus

Teaching beginner programming concepts with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Christopher Mitchell, New York, New York, United States

Thomas Dickerson, Kingston, Massachusetts, United States

This session will introduce you to TI Basic for the TI-84 Plus C Silver Edition graphing calculator/ TI-84 Plus CE technology, and will motivate the pedagogical value of encouraging your students to pursue graphing calculator programming. Attendees will learn important programming commands and will write a few programs of your own. The lesson will be grounded in material from the book “Programming the TI-83 Plus/TI-84 Plus” by Christopher R. Mitchell, and sample lesson plans that you can use to teach programming (as a primary topic or curriculum enrichment) will be presented.

2 – 3 p.m.

**Gold Coast
West Tower, Concourse Level**

60-minute hands-on
All levels
Coding and STEM

Why do scientists linearize data and mathematicians don't?

TI-Nspire™ CX Navigator™ System

Greg Dodd, Charleston, West Virginia, United States

Science and math teachers speak a different “language,” with terminology varying between the two classrooms. This causes students to fail to make the necessary connections between science and math. Six of the major disconnects include: significant figures; solving/isolating variables; literal equations; linearizing data; the use of units in measurements; and the use of the metric system in place of the English system. This disconnect between science and math instruction occurs because science analyzes data to find a mathematical relationship, while mathematics manipulates an already established relationship. This session will explore Boyle's Law and kinetics data analysis to help bridge the gap between science and math.

2 – 3 p.m.

**Water Tower
West Tower, Concourse Level**

60-minute hands-on
Beginner
STEM/Connecting Science
and Math

Simple machines design challenge for middle school science and math students

Kimberly Brandt, Lyndhurst, Ohio, United States

Anna Delia, Lyndhurst, Ohio, United States

Would you like to provide your middle school science and math students the opportunity to incorporate inquiry, equations, construction and graphical representations, all in one unit? We have developed a design challenge to investigate the historical use, function and physics of levers, inclined planes, pulleys and trajectory motion. Participants will experience the various stages of the design challenge – from the perspective of both the student and the teacher. Activities include physics and geometric calculations; use of the Video Physics program for recording the path of a projectile, and then importing it into TI-Nspire™ CX technology; the dimensional analysis process for converting between units; executing a budget; and graphical representations of data using TI-Nspire™ CX software.

2 – 3 p.m.

**Columbian
West Tower, Concourse Level**

60-minute lecture/demonstration
All levels
STEM/Connecting Science
and Math

So you want to have a STEM camp – coding and creating with the TI-Innovator™ Hub with TI LaunchPad™ Board

David Willis, Lufkin, Texas, United States

Lorelei Cummings, Lufkin, Texas, United States

Last summer, two newbies offered a coding and creating camp built around the TI-Innovator™ Hub ... and we survived! Come learn what we did, what we discovered and what we will do differently next time. Topics addressed will include preparation, supplies, curriculum, schedule and lessons learned. The activities are available in TI-84 Plus CE and TI-Nspire™ technology versions. This camp could easily be adapted to other time frames and grade levels. Teachers, bring your administrator with you!

2 – 3 p.m.

**Picasso
West Tower, Concourse Level**

60-minute lecture
All levels
Coding and STEM

Investigating temperature with TI-Nspire™ CX technology

TI-Nspire™ CX technology

Elizabeth Belcher, Panama, Oklahoma, United States

Jeff Lukens, Sioux Falls, South Dakota, United States

You don't have to reinvent the thermometer to meet your science standards. Connecting thermal energy investigations to mathematical data analysis is easier than you think. Even beginners can use the TI-Nspire™ CX handheld to capture data and analyze rates of change. Technology integration can help you bring the heat to your science classroom.

2 – 3 p.m.

**Haymarket
West Tower, Concourse Level**

60-minute hands-on
Beginner
General Science

Dynamic Riemann sums to evaluate integrals and volumes with TI-Nspire™ CX CAS technology

TI-Nspire™ CX CAS technology

Jean-Jacques Dahan, Toulouse, France

In this session, we will construct – for each given function – the N rectangles representing some Riemann sums. We will only use piecewise functions, the sum tool and a slider to command N. At the end, we will obtain a file that can be used by the teacher – and his or her students – as an app to investigate the areas of these rectangles and understand what is an integral. In a second part – with the same technique – we will approach the volumes of solids of revolutions with the volumes of cylinders.

2 – 3 p.m.

**Wrigley
West Tower, Concourse Level**

60-minute lecture/demonstration
All levels
Calculus

Coding on the TI-84 Plus CE graphing calculator and TI-Nspire™ CX technology

TI-Nspire™ CX technology

Lisa Suarez, Columbia Station, Ohio, United States

Sheryl Edwards, Cleveland, Ohio, United States

Participants will learn how to use the programming feature – on both the TI-84 Plus CE and TI-Nspire™ CX technology – to teach computer science concepts, while also helping students better understand mathematical concepts along the way. Come learn how to write several programs – such as a quadratic equation solver and equation grapher – side-by-side, on both the TI-84 Plus CE and TI-Nspire™ CX technology.

2 – 3 p.m.

**Hong Kong
West Tower, Ballroom Level**

60-minute lecture/demonstration
Beginner
Coding

Muffin mania

TI-Nspire™ App for iPad®

Tamara Penn, Guaynabo, Puerto Rico

Food – the ultimate learning tool. Join us for an activity with the TI-Nspire™ App for iPad® that allows calculus students to apply their knowledge of calculating volumes and surfaces of revolution of solids in a hands-on way. Participants will synthesize capabilities of the Graphs, Calculator, Lists & Spreadsheets, and Data & Statistics pages of the TI-Nspire™ App for iPad® into one engaging activity. Muffins provided!

2 – 3 p.m.

**Acapulco
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Calculus

Flipping the algebra I classroom utilizing the TI-Nspire™ App for iPad®

TI-Nspire™ App for iPad®

Karen Latham, Andover, Massachusetts, United States

Allowing students to learn and discover new algebraic relationships prior to class enhances and enriches the discussion in the classroom. With the help of the TI-Nspire™ App for iPad®, interactive lessons that explore the relationship between an equation and its graph can be created. In this session, I will demonstrate how I have been able to utilize TI-Nspire™ technology to achieve this goal in my algebra I classroom.

2 – 3 p.m.

**Toronto
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Algebra I

Learner-centered buffet: all you can teach

TI-84 Plus CE graphing calculator

Kristy Curran, Baltimore, Maryland, United States

Amy Parlette, Baltimore, Maryland, United States

Participants will engage in hands-on, low-tech and high-tech learner-centered strategies built for a secondary mathematics classroom. Instructional strategies will include best practices for formatively assessing students and implementing responsive, small group instruction. At the end of the session, participants will be provided with a buffet of instructional strategies to utilize in the mathematics classroom. Participants will also learn best practices relevant to 1-to-1 classroom environments in the subjects of algebra I, geometry, algebra II and calculus.

2 – 3 p.m.

**San Francisco
West Tower, Ballroom Level**

60-minute hands-on
Beginner
Geometry

Graphing one-variable data using the TI-84 Plus family of graphing calculators

TI-84 Plus CE graphing calculator

Valerie Roebuck, Houston, Texas, United States

Jennifer High, Conroe, Texas, United States

Attend this session to help your students engage in the learning process of graphing relevant data on the TI-84 Plus CE graphing calculator. Your students will quickly discover measures of central tendency and measures of variability as they explore box plots and histograms. You'll leave this session with a ready-made lesson to take back and use with your students.

2 – 3 p.m.

**New Orleans
West Tower, Ballroom Level**

60-minute hands-on
Beginner
Middle Grades Math

Variable? What's that?

TI-Nspire™ CX Navigator™ System

Jane Damaske, Saint Joseph, Michigan, United States

Judy Hicks, Arvada, Colorado, United States

Is equal the same as equivalent? Do our students fully make the connection and comprehend the differences? What if we, as educators, could enhance our students' numeracy by using dynamic lessons where learners become involved in mathematical concepts by using interactive technology? In this session, participants will experience the dynamic TI-Nspire™ simulations – from the free Building Concepts lesson series – that push students' thinking to an understanding that a variable can take on any one of a range of values, and that solutions to an equation are the replacement values for the variable that make the equation true.

2 – 3 p.m.

**Michigan 1A
East Tower, Concourse Level**

60-minute hands-on
Beginner
Middle Grades Math

Starfish family transformed with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Barbara Ward, Montgomery, Texas, United States

Let's create "Patrick the Starfish" and his family using transformations on the TI-84 Plus CE. Participants will create a connected line plot on a starfish image, and then create the whole starfish family using transformations and functions. In addition, line segments, line plots and functions – including QuickPlot and Fit-EQ – will be used to explore relations and their inverses. Join us to see how color has enhanced the TI-84 Plus C Silver Edition graphing calculator.

2 – 3 p.m.

**Michigan 1B
East Tower, Concourse Level**

60-minute hands-on
Beginner
Algebra I

5Es learning cycle lesson plans using TI technology

TI-84 Plus Silver Edition graphing calculator

Miriam Santana, Rochester, New York, United States

This presentation focuses on planning inquiry lessons using the 5Es lesson plan model (Engagement, Exploration, Explanation, Elaboration and Evaluation). During the presentation, we will explore topics such as linear and quadratic functions using the TI-84 Plus family of graphing calculators and its apps.

2 – 3 p.m.

**Michigan 1C
East Tower, Concourse Level**

60-minute hands-on
Beginner
Algebra I

Engaging student activities using the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Josh Mize, Glenelg, Maryland, United States

Every teacher would agree: if your students are engaged in your classroom, they experience greater success in their learning. Using technology the right way allows us to ask questions and look at mathematics in a way that not only increases student engagement, but also addresses the Common Core State Standards and makes learning more fun. We will explore these activities using the TI-84 Plus CE. You will walk away with activities that are ready to use in your classroom, and that address Common Core.

2 – 3 p.m.

**Michigan 2
East Tower, Concourse Level**

60-minute hands-on
Intermediate
Algebra II

Statistics in algebra I

TI-Nspire™ CX technology

Robin Levine-Wissing, Buckeye, Arizona, United States

Lee Kucera, Laguna Beach, California, United States

In this session, algebra teachers will experience actual classroom lessons/activities for the statistics standards in the new math curriculum being implemented around the nation. TI-Nspire™ CX technology will be used, but the lessons are adaptable to any technology. Come and collaborate with algebra teachers on statistics concepts.

2 – 3 p.m.

**Michigan 3
East Tower, Concourse Level**

60-minute hands-on
Beginner
Algebra I

Breakout EDU with TI-Nspire™ CX technology

TI-Nspire™ CX technology

Jennifer Kelly, Pearland, Texas, United States

Breakout EDU brings the escape-room experience to the classroom by creating ultra-engaging learning games for people of all ages. Games (Breakouts) teach teamwork, problem solving, critical thinking and troubleshooting by presenting participants with challenges that ignite their natural drive to problem solve. Participants will use the features of TI-Nspire™ CX technology – including geometry tools, regressions, matrices and sliders – to complete a series of challenges, reveal clues and unlock mysteries in order to win the game. This session will begin with a short introduction – followed by playing the game – and will conclude with a short discussion about the game and how the activity can be used.

2 – 3 p.m.

**Columbus CD
East Tower, Ballroom Level**

60-minute hands-on
All levels
General Math

Six degrees of separation

TI-Nspire™ CX Navigator™ System

Ray Barton, Salt Lake City, Utah, United States

How many common acquaintances separate you from anyone else in the world? You know people are networked, but did you know that diseases, research papers, business entities, web pages and many other surprising objects are connected in remarkable ways? This topic provides rich tasks with multiple access points for students to explore, reason and problem solve. We will use the TI-Nspire™ CX Navigator™ System to set up our own classroom network, and see how this powerful technology can help teachers manage meaningful classroom discourse.

2 – 3 p.m.

**Columbus EF
East Tower, Ballroom Level**

60-minute hands-on
All levels
General Math

How might we develop mindsets, opportunities and access to STEM for more students?

John Staley, Towson, Maryland, United States

Creating rich learning environments that ensure access to STEM-related experiences for more students must be embedded in the K–12 classroom. “Recent” changes in mathematics and science standards provide opportunities for a mindset shift that involves teacher use of integrated tasks, cross-curricular collaboration and shifts in teaching practices. During this session, participants will engage in opportunities to develop their STEM mindset as they participate in activities and discussions focused on the teaching and learning of STEM content courses. This session is for classroom teachers, teacher leaders, building level leaders and all who support the teaching and learning process.

2 – 3 p.m.

**Columbus G
East Tower, Ballroom Level**

60-minute lecture
All levels
STEM/Connecting Science
and Math

Always in transition

TI-84 Plus CE graphing calculator

Jim Nakamoto, Richmond, British Colombia, Canada

Simple tree diagrams are the start to solving extensive decision-making problems with the power of the TI-84 Plus CE graphing calculator. In this session, the use of matrices will be demonstrated in analyzing and solving stochastic processes.

2 – 3 p.m.

**Columbus H
East Tower, Ballroom Level**

60-minute lecture/demonstration
All levels
General Interest

Meaningful two-way assessments using the TI-Nspire™ CX Navigator™ System

TI-Nspire™ CX Navigator™ System

Robin Gapinski, Highland Park, Illinois, United States

Deborah Dicker, Highland Park, Illinois, United States

In this session, you'll learn the "pros and cons" of quick polls versus sending and collecting documents. You'll observe how students can do their homework on the TI-Nspire™ CX handheld and then submit it to you for feedback. An emphasis will be placed on how the teacher can use the Portfolio & Review features on the TI-Nspire™ CX Navigator™ System. Participants will learn how to give in-depth feedback to students through a two-way approach involving redistributing graded self-check assessments with individualized and meaningful feedback. It will not only make collecting and grading assessments easy, but will encourage your students to reflect, persevere in problem solving and take ownership of their own learning process.

2 – 3 p.m.

**Columbus IJ
East Tower, Ballroom Level**

60-minute lecture/demonstration
Intermediate
General Interest

TI-Nspire™ CX CAS technology and a play on the notion of variation

TI-Nspire™ CX CAS technology

Julián Ricardo Gómez Niño, Bogotá, Colombia

This workshop will show the pedagogical importance of the different tools within TI-Nspire™ CX CAS technology. It will do so in the construction of the notion of variation, and in a mediated game situation that articulates various techniques of representation. The session aims to reflect on the educational potential that presents the dynamics to optimize processes, experiment with models and develop fluency in representational geometry. A game called "Estimator" – where data is collected – will be played, and the game is represented in different environments of TI-Nspire™ CX technology (in order to model various situations of variation).

3:15 – 4:15 p.m.

**Dusable
West Tower, Third Floor**

60-minute lecture/demonstration
Intermediate
CAS

The TI-Nspire™ CX Navigator™ System – as easy as 1-2-3

TI-Nspire™ CX Navigator™ System

Della Highman, Columbus, Ohio, United States

The TI-Nspire™ CX Navigator™ System is an awesome way to keep your students more engaged in your lessons. Learn how to create documents, activities and quick polls for your students to explore and learn. So many possibilities! Come see how easy it is to get started today.

3:15 – 4:15 p.m.

**Field
West Tower, Third Floor**

60-minute hands-on
Beginner
Formative Assessment

Getting the most from your TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Deb Nutt, Celina, Ohio, United States

You've used the TI-84 Plus CE in your classroom for years, but do you know everything it can do to help your students? Every family has its secrets, so come and learn about some of the little known menu features and pre-loaded apps that are a part of the TI-84 Plus family of graphing calculators. Every time I present this session, I hear attendees say, "Wow, I didn't know we could do that!"

3:15 – 4:15 p.m.

**Horner
West Tower, Third Floor**

60-minute hands-on
Beginner
General Interest

Women, woodworking and the wonders of math

TI-Nspire™ CX Navigator™ System

Lauren Carr, Philadelphia, Pennsylvania, United States

What do you do as an end-of-the-year project? This session explores students who created a service-learning based project involving woodshop, calculus and statistics – along with a genuine message to truly Nspire an appreciation for mathematics.

3:15 – 4:15 p.m.

**Ogden
West Tower, Third Floor**

60-minute lecture/demonstration
All levels
Calculus

Time to build – project-based learning for math/physics/engineering

TI-84 Plus CE graphing calculator

Nathan Durbin, Louisville, Kentucky, United States

Looking for a way to get students engaged and excited about class? This presentation will provide a project idea for building a catapult that will do just that. This simple project can be used and modified to meet students' needs at both high and low levels, and will cover multiple standards in a variety of disciplines. Creativity, collaboration, data collection, graphing, calculations and writing are just a few areas that can be involved, and the project can be utilized by teachers of algebra I/II, geometry and precalculus. The TI-84 Plus CE graphing calculator is typically used in this exercise, but a variety of models can be incorporated.

3:15 – 4:15 p.m.

**Wright
West Tower, Third Floor**

60-minute lecture/demonstration
All levels
Precalculus

CAS across the curriculum

TI-Nspire™ CX CAS technology

Fred Ferneyhough, Brampton, Ontario, Canada

Ron Armontrout, Oxford, Maine, United States

We all know that CAS can be used advantageously in early algebra and in calculus. But what about in other courses? This session will focus on the many CAS features that can help students learn concepts in algebra II and precalculus.

3:15 – 4:15 p.m.

**Addams
West Tower, Third Floor**

60-minute hands-on
Intermediate
CAS

Investigating functions using TI-Nspire™ CX CAS technology

TI-Nspire™ CX CAS technology

Ken Collins, Charlotte, North Carolina, United States

In this session, participants will explore the characteristics of the precalculus functions using TI-Nspire™ CX CAS technology and sliders. Come learn how to construct these explorations and how to develop games where students will create a function that matches a given graph. Classroom ready handouts will be provided.

3:15 – 4:15 p.m.

**McCormick
West Tower, Third Floor**

60-minute hands-on
Intermediate
Precalculus

STEM investigations with the TI-Innovator™ Hub with TI LaunchPad™ Board

TI-84 Plus CE graphing calculator

Stacy Thibodeaux, Lafayette, Louisiana, United States

In this session, teachers will use the TI-84 Plus CE graphing calculator, combined with the TI-Innovator Hub™, to connect STEM to a real world problem: "How Clean is Your Water?"

3:15 – 4:15 p.m.

**Gold Coast
West Tower, Concourse Level**

60-minute hands-on
Beginner
Coding and STEM

STEM made easy – bringing math and science together through technology

TI-Nspire™ CX Navigator™ System

Karlheinz Haas, Hobe Sound, Florida, United States

Ever wonder how to get your colleagues in the math and science departments to join together and use data to learn the mathematics behind the science – or the science behind the math content? How can you get your science colleagues to use real data to explore the mathematics behind the science? Come see how TI-Nspire™ CX technology can help. Our workshop will offer ideas to move from the typical teacher-led classroom to one that focuses on problem-solving and exploratory learning through the use of data. Additional focus will center on making the STEM connections between numerical and graphical representations, and on linking the science to the math. You can use one, or multiple sensors for lab-based- or in-the-field data collection, to collect and analyze data.

3:15 – 4:15 p.m.

**Water Tower
West Tower, Concourse Level**

60-minute hands-on
All levels
STEM/Connecting Science
and Math

Using STEM to create art

TI-Nspire™ CX CAS technology

Suzanne Tucker, Madeira, Ohio, United States

Christy Barton, Madiera, Ohio, United States

In this session, you'll learn about how students can study parabolic trajectories in out-of-the-box situations. First, students will create equations and use List & Spreadsheets, and graphing utilities, to model these trajectories. They will then align and suspend ping pong balls – to create the sense of motion of their trajectories – throughout your classroom or school in this exercise.

3:15 – 4:15 p.m.

**Columbian
West Tower, Concourse Level**

60-minute lecture/demonstration
All levels
STEM/Connecting Science
and Math

Problems worth coding

TI-Nspire™ CX Navigator™ System

Peter Fox, Clayton South, Australia

Help your students develop a sense of inquiry through TI technology and some basic coding. The mathematical problems posed in this session are simple to understand, yet they provide genuine opportunities for students to explore. Students can learn to code as the demand arises. Whether you're an absolute novice or have already graduated to 10 Minutes of Coding, you will find plenty of rich activities and opportunities for you and your students. Note: While the session will use the TI-Nspire™ CX CAS handheld, the activities and coding can also be completed using a TI-84 Plus CE graphing calculator.

3:15 – 4:15 p.m.

**Picasso
West Tower, Concourse Level**

60-minute hands-on
Intermediate
Coding and STEM

Lab RAT: Laboratory Readiness Abilities Test

TI-84 Plus Silver Edition graphing calculator

Rachal Roessler, Lorena, Texas, United States

This presentation is devoted to laboratory teaching and how to assess students' skills in order to prepare them for college and careers. Throughout the semesters, students will have used computers, calculators and probes as an integral part of their lab experiences. In a "Lab RAT," the instructor will give them an open-ended objective in which they must determine the procedure to evaluate the objective successfully. Students must then research and discuss various options, and define what their lab limitations are – this will enable them to determine an appropriate procedure. They will also be expected to produce appropriate charts and graphs, and extrapolate information for the explanation of their data.

3:15 – 4:15 p.m.

**Haymarket
West Tower, Concourse Level**

60-minute lecture
Beginner
Chemistry

Project-based lesson in AP* Calculus

TI-Nspire™ CX CAS technology

Michael Long, Kapolei, Hawaii, United States

Graduating seniors in AP* Calculus need a way to say 'mahalo' (thank you) to adults who have helped them get to this point. Come to this session and explore a unique, hands-on project-based learning project that allows students to apply calculus and statistics to a task that accomplishes this goal. A demonstration will be given of how TI-Nspire™ CX CAS technology supports the students' heartfelt projects, which have been well received by both the students and adults.

3:15 – 4:15 p.m.

Wrigley
West Tower, Concourse Level

60-minute lecture/demonstration
Intermediate
Calculus

The basics of coding with TI Basic and TI-Nspire™ CX technology

TI-Nspire™ CX CAS technology

Johnny Ashurst, Baxter, Kentucky, United States

Lindsay Gold, Dayton, Ohio, United States

This session will introduce participants to the TI Basic coding language for TI-Nspire™ CX technology. We will learn how to use programming commands built into TI-Nspire™ CX technology; write a few simple programs; explore options for storing and using our programs; and discuss the benefits of coding. TI-Nspire™ CX CAS handhelds will be available.

3:15 – 4:15 p.m.

Hong Kong
West Tower, Ballroom Level

60-minute hands-on
Beginner
Coding

Graphing functions is easy. Just use the Force

TI-84 Plus CE graphing calculator

Richard Boyd, Miami, Florida, United States

With the emphasis on high stakes testing, students need to use the tools of algebra II to recognize the graph of a function based on vertex, vertical stretch or compression, roots, and skills such as completing the square. This session will examine these topics.

3:15 – 4:15 p.m.

Acapulco
West Tower, Ballroom Level

60-minute hands-on
Intermediate
Algebra II

That's the way the ball bounces

TI-84 Plus CE graphing calculator

Michelle Merriweather, Bronxville, New York, United States

This session will demonstrate how to collect data using probes and the TI-84 Plus CE family of graphing calculators. We will work through several activities that will help to connect the functions we study with their applications. Applications include ball bounce – to study quadratic and exponential functions – and an aspirin simulation to study power functions.

3:15 – 4:15 p.m.

Toronto
West Tower, Ballroom Level

90-minute hands-on
Beginner
Precalculus

Statistical understanding through simulation

TI-Nspire™ CX Navigator™ System

Jessica Kachur, Kenosha, Wisconsin, United States

Erik Herbrechtsmeier, Kenosha, Wisconsin, United States

The use of simulations in statistics leads well into an exploration and discovery of mathematics. Come participate in some activities that you can bring right back to your classrooms.

3:15 – 4:15 p.m.

Atlanta
West Tower, Ballroom Level

60-minute hands-on
All levels
Statistics

Setting bounds – coping with approximation errors in calculus

TI-Nspire™ CX Navigator™ System

Dennis Wilson, Fairburn, Georgia, United States

Calculus gives access to quick approximations through various methods. But how accurate are these approximations? Students frequently struggle in dealing with errors of approximation. This session will explore using TI-Nspire™ CX technology in various ways to help students visualize both error bounds and the methods used to find them. As “Alternating Series Error Bound” is added to the AP* exam this year, we will address this topic and its difference from “Lagrange Error Bound” using the Mathematical Practices for AP* Calculus (MPACs).

3:15 – 4:15 p.m.

**San Francisco
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Calculus

Origami boxes as a context for rich mathematical thinking

TI-84 Plus CE graphing calculator

Arsalan Wares, Valdosta, Georgia, United States

This session will allow participants to make a non-traditional origami box – and explore various mathematical properties of the constructed box – using TI-83 Plus graphing calculators/TI-84 Plus CE graphing calculators. The session will give participants – especially teachers – an opportunity to understand and experience how many of the Common Core process standards can be addressed through origami and technology. For instance, the participants will solve challenging mathematical problems using graphing technology and the constructed origami box. Participants will get a chance to see how origami can create a context for rich mathematical thinking in middle school, high school and beyond. The session will help teachers to integrate TI technology into their teaching repertoire.

3:15 – 4:15 p.m.

**New Orleans
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Geometry

What’s that app key for, and why should I care?

TI-84 Plus Silver Edition graphing calculator

Donna Harris, Saginaw, Texas, United States

There are many free apps for the TI-84 Plus CE graphing calculator that can engage your students as they learn new information – or review topics they may have forgotten. We will explore a variety of apps, including Area Formulas, Decimal Defender, Math By Hand, Probability Simulation, Rational Number Rampage and Topics in Algebra I. Feel free to bring your own TI-84 Plus Silver Edition graphing calculator, or you may borrow one for this session. Please note: With the exception of Probability Simulation, these apps are not yet compatible with the color-screen members of the TI-84 Plus family.

3:15 – 4:15 p.m.

**Michigan 1A
East Tower, Concourse Level**

60-minute hands-on
All levels
Middle Grades Math

Rich tasks using the TI-84 Plus CE graphing calculator for reasoning and problem-solving

TI-84 Plus CE graphing calculator

Howard Stern, Bronx, New York, United States

We know that students must be involved in making sense of math if they are to be engaged in their own learning. Using rich tasks in reasoning and problem-solving – with the TI-84 Plus CE platform – can help students with that involvement. Join us in this session where the speaker will share some activities he has used in his Common Core State Standards algebra classroom.

3:15 – 4:15 p.m.

**Michigan 1B
East Tower, Concourse Level**

60-minute hands-on
Intermediate
Algebra I

Inspire low-level algebra learners using TI-Nspire™ CX technology

TI-Nspire™ CX technology

Holly Terrill, Vernon, New Jersey, United States

In this session, the presenter will walk participants through step-by-step instructions on algebraic activities. Participants will be able to experience the role of the teacher as well as the student, and activities will be individual as well as group-based. Special emphasis will be placed on modifying projects for low-level and special needs students. Files will be shared with interested participants.

3:15 – 4:15 p.m.

**Michigan 1C
East Tower, Concourse Level**

60-minute hands-on
Intermediate
Algebra I

Statistics labs for algebra I

TI-Nspire™ CX Navigator™ System

Sharon Cichocki, Orchard Park, New York, United States

Come explore how to engage your students with statistics, using hands-on statistics labs that promote learning and understanding of difficult statistics concepts. Hard copy labs will be provided, as well as a materials list to complete the labs.

3:15 – 4:15 p.m.

**Michigan 2
East Tower, Concourse Level**

60-minute hands-on
Beginner
Algebra I

Slow motion to accelerate math

TI-Nspire™ CX CAS technology

Marco Martinez, Albuquerque, New Mexico, United States

In this session, teachers will learn how to combine slow motion videos to generate data to mathematical models. The use of smartphones in class – combined with tablets or computers, along with TI-Nspire™ CX CAS handhelds – provide a sense of reality to students; shows them how mathematical models can be used in real life; and how the behavior of different elements can be modeled using the features included in TI-Nspire™ CX CAS handhelds. This session will include parabolic motion, exponential decay and simple harmonic motion. The presenters are Laura Corral, current teacher at Del Norte High School, and Marco Martinez, assistant principal at Sandia High School (who also received the Presidential Award for Excellence in Mathematics and Science Teaching – 2013).

3:15 – 4:15 p.m.

**Michigan 3
East Tower, Concourse Level**

60-minute hands-on
Intermediate
Algebra II

Differentiating instruction using TI-Nspire™ CX technology

TI-Nspire™ CX technology

Chris Longueria, Clover Park, Washington, United States

Everyday in our classroom, we as educators struggle with how to meet the diverse needs of our students. In this session, you will experience firsthand how you can use TI technology when differentiating your lessons to meet the needs of each student in your classroom. In addition, you will experience firsthand how this differentiation can increase your classroom discourse and student engagement.

3:15 – 4:15 p.m.

**Columbus CD
East Tower, Ballroom Level**

60-minute hands-on
Intermediate
General Math

Picture it: algebraic transformations

TI-84 Plus CE graphing calculator

Jennifer High, Conroe, Texas, United States

Debbie Sheridan, Spring, Texas, United States

Come explore equations found in real-life pictures using the Transformation Graphing app for the TI-84 Plus CE graphing calculator. Learn how to download pictures on your TI-84 Plus CE that represent linear, quadratic, absolute value and more. Then use the Transformation Graphing app to manipulate equations to model the pictures.

3:15 – 4:15 p.m.

**Columbus EF
East Tower, Ballroom Level**

60-minute hands-on
Beginner
General Math

Math practices, rich tasks and modeling should have twists and turns

TI-84 Plus CE graphing calculator

Allan Bellman, Oxford, Mississippi, United States

Linda Antinone, Ft. Worth, Texas, United States

To support mathematical practices, rich tasks and modeling, problems need multiple entry points and approaches. They also need interesting twists and turns as models are developed. Come experience how to help students take charge of their own learning through a motivating activity. Start with a video that sets context – you will have to determine both the question and how to extract data. As you develop your model, not all needed information will be obvious. By the end, you will have worked with quadratic functions, descriptive statistics, data collection, ratios and proportions using digital images ... and who knows what else will come your way. As you work, you'll need to test and revise your models. Collaborative grouping will be discussed.

3:15 – 4:15 p.m.

**Columbus G
East Tower, Ballroom Level**

60-minute hands-on
All levels
Algebra II

Building teacher engagement, enthusiasm and interest through interactive professional development events

TI-84 Plus CE graphing calculator

Christine Kasitz, San Fernando, California, United States

Building excitement through engagement and gaining teacher buy-in to use technology is often times challenging. We took a unique approach and brought our teachers/tutors together – as students – to walk them through the technology activities within the curriculum in a safe, collaborative and fun environment. Drawing on the knowledge and expertise of both the math and science teachers, these cross-curriculum teams had to work together through exploratory activities. At the end of the day, the teachers were asking for more days of professional development (PD) and more activities to use with their students. In this session, you will learn the learning objectives for the event; how the day was designed; the overall, long term PD plan; and how to measure success.

3:15 – 4:15 p.m.

**Columbus H
East Tower, Ballroom Level**

60-minute lecture
All levels
General Interest

Calculating wind chill in the Windy City

TI-84 Plus CE graphing calculator

Scott Keltner, Eudora, Kansas, United States

Want to put the “Windy City” claim to the test? This session will show how to use the TI-Nspire™ CX handheld and/or TI-84 Plus CE graphing calculator to collect wind and temperature data to compute the wind chill in real-time. This session will focus on making real connections to exponential and multi-variable data.

3:15 – 4:15 p.m.

**Columbus IJ
East Tower, Ballroom Level**

60-minute lecture/demonstration
Intermediate
Algebra II

STEM Behind Sports: the field goal activity and how to create your own on the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Tom Reardon, Poland, Ohio, United States

Capture your students’ interest in STEM by kicking around this activity. In this session, we’ll explore having your students play and investigate the mathematics and science needed to engineer how to kick the game-winning field goal using TI technology. This activity is written for three different levels: eighth grade and algebra I; geometry; and algebra II and beyond. It includes all the materials needed to engage your students, including preassignments, worksheets (gifts), programs, teacher notes and solutions. Have your students model the flight of the ball; simulate the defense; decide graphically and algebraically if the kick is good; and more! The background on how this activity was created will be illustrated, and participants will learn how to create your own similar type of activity.

3:15 – 4:15 p.m.

**Columbus KL
East Tower, Ballroom Level**

60-minute hands-on
Beginner
General Math

A stylized white line-art graphic of a city skyline with various building shapes, positioned behind the main text.

*Come learn.
Go teach.*

#T3IC

Saturday Session Details

Code mode: learn to teach coding to adolescent and young adult students using the TI-84 Plus Silver Edition graphing calculator

TI-84 Plus Silver Edition

John Isaacs, Huber Heights, Ohio, United States

Participants in this session will learn to code a provided TI-84 Plus Silver Edition graphing calculator using TI Basic. Instructional techniques, lesson planning and assignments will be highlighted to apply proven practices to code working programs. I will present my war stories of successful teaching strategies, with demonstrations. Participants will learn how to teach adolescent and young adult students how to create code and write working programs. Successful instructional techniques regarding pedagogy, terminology, logic, lesson planning and assignments will be highlighted. A provided calculator will be used to apply hands-on proven practices to write code and create working programs that teachers can take back to their classrooms.

8:30 – 10 a.m.

**Dusable
West Tower, Third Floor**

90-minute hands-on
Beginner
Coding

Coloring your world – introduction to Lua programming

Becky Byer, Casper, Wyoming, United States

Becky Underwood, Casper, Wyoming, United States

Have you ever looked at a TI-Nspire™ document and wondered, “How’d they do that? It looks like an applet.” Chances are, it might have been a file coded in Lua. Come learn Lua programming from the ground up. You’ll learn how to say “Hello world,” color your world, give it shapes and execute actions. We’ll get you started and then provide you with resources to help you further your programming adventure.

8:30 – 10 a.m.

**Field
West Tower, Third Floor**

90-minute hands-on
Beginner
Coding

Developing number sense with technology-based science experiments in primary grades

TI-84 Plus Silver Edition graphing calculator

Irina Lyublinskaya, Staten Island, New York, United States

In this workshop, participants will engage in inquiry-based science lab activities that address National Council of Teachers of Mathematics standards for mathematics. The session will focus on such topics as comparing positive numbers; comparing decimals; placing numbers on a number line; addition of positive and negative numbers; commutative and associate properties of addition; and more. The unique feature of the lab activities is the natural connection that is made between a mathematics concept and a science topic. This allows the teacher to use these experiments to integrate mathematics and science learning in the elementary classroom – and to make real-life connections for the childrens’ development of the number sense.

8:30 – 10 a.m.

**Horner
West Tower, Third Floor**

90-minute hands-on
All levels
Elementary Math

Navigating your data: student data tracking and PLC

TI-Nspire™ CX Navigator™ System

Monique Chatman, Missouri City, Texas, United States

Ariel Taylor, Richmond, Texas, United States

Do data digs with your PLC leave you feeling overwhelmed? Come learn how to integrate technology with student data tracking to help you streamline this process. Technology will be used to help students track their progress so they become more self-aware of their strengths and areas for improvement. It will also be used to spark math discussions and to help drive PLC decisions about instruction. Participants will leave with ideas so they never have to work harder than their students ... at least where data is concerned.

8:30 – 10 a.m.

**Ogden
West Tower, Third Floor**

90-minute lecture/demonstration
All levels
Assessment

Create silent movies with the TI-84 Plus family of graphing calculators to model the real world

TI-84 Plus CE graphing calculator

John LaMaster, Fort Wayne, Indiana, United States

Stuart Moskowitz, Arcata, California, United States

In this session, you'll bring your textbook story problems to life and make them into silent movies using the TI-84 Plus family of graphing calculators. Animations heighten student engagement and understanding, as well as strengthen connections between math and the real world. Examples for the precalculus curriculum will be highlighted, and you will leave with the tools to create your own silent movies.

8:30 – 10 a.m.

**Wright
West Tower, Third Floor**

90-minute hands-on
Beginner
Precalculus

Student engagement in calculus with CAS in an active learning classroom

TI-Nspire™ CX Navigator™ System

Douglas Lapp, Mount Pleasant, Michigan, United States

This session focuses on how technology changes teaching and learning in a calculus course. The role of student discourse is examined as participants get experience with the use of a computer algebra system (CAS) in a manner consistent with an Active Learning Classroom. In this approach, students are given a great deal of control over the mathematical explorations and labs, and are held accountable for reporting out their observations and conjectures – both with and without a student response system (TI-Nspire™ CX Navigator™ System). Connections to the Common Core State Standards are discussed, with particular attention to standards of mathematical practice.

8:30 – 10 a.m.

**Addams
West Tower, Third Floor**

90-minute hands-on
Intermediate
CAS

CAS in the nine through 16 mathematics curriculum? Indeed

TI-Nspire™ CX CAS technology

Jay Schiffman, Philadelphia, Pennsylvania, United States

Students often view mathematics in isolation and therefore become frustrated. In this hands-on workshop, participants will solve problems from various branches in the secondary mathematics curriculum, including algebra; number and operations; geometry; pre-calculus; calculus; probability; and discrete mathematics. For example, the computer algebra system (CAS) will enable one to furnish simple proofs via algebra; explore and discover patterns; form conjectures based upon the analysis of these patterns; and create counterexamples – all in the spirit of engaging mathematics. In addition, the TI-Nspire™ CX CAS handheld enables one to alleviate the tedium of long and rather unproductive computations, while paving the way for a more productive discussion and analysis of essential mathematics.

8:30 – 10 a.m.

**McCormick
West Tower, Third Floor**

90-minute hands-on
Intermediate
CAS

Introduction to projects with the TI-Innovator™ Hub with TI LaunchPad™ Board using the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Fred Fotsch, Dallas, Texas, United States

Are you interested in introducing student projects that incorporate math, coding (programming) and science into your classroom? Participate in this hands-on workshop and you will learn skills and pedagogy needed to incorporate the new TI-Innovator™ Hub technology into your curriculum. Skills practiced in this session will include writing a TI Basic program to control an input or output circuit (that will be built on a breadboard using electronic sensors and actuators). This session will use the TI-84 Plus CE technology platform; the skills learned here are also relevant to the TI-Nspire™ CX handheld platform. Beginners welcome!

8:30 – 10 a.m.

**Gold Coast
West Tower, Concourse Level**

90-minute hands-on
Beginner
Coding and STEM

STEM = S+T+E+M

TI-Nspire™ CX Navigator™ System

Linda Antinone, Fort Worth, Texas, United States

Allan Bellman, Oxford, Mississippi, United States

Participants in this session will apply math and science practices to engage students in multi-disciplinary lessons that are doable in either math, physics or chemistry classes. We'll make connections for students to topics in the curriculum – from standard courses – to enhance students' conceptual understanding of important ideas. Mathematical modeling with transformations will be a focus in these real-world, data collection lessons.

8:30 – 10 a.m.

**Water Tower
West Tower, Concourse Level**

90-minute hands-on
Beginner
STEM/Connecting Science
and Math

Innovative blast off with pipette rockets and TI-Nspire™ CX CAS technology

TI-Nspire™ CX CAS technology

Todd Morstein, Kalispell, Montana, United States

In this session, we'll use the TI-Innovator™ Hub with TI LaunchPad™ Board to program blast off for pipette rockets. Participants will generate hydrogen and oxygen for the pipette rockets, and then program the TI-Innovator™ Hub to launch them. We will focus on creating the best ratio to create the greatest launch velocity, as measured with the Motion detector. Explore propulsion, chemical reactions, velocity and a little programming, in this session.

8:30 – 10 a.m.

**Picasso
West Tower, Concourse Level**

90-minute hands-on
Beginner
Coding and STEM

Exploring renewable wind energy

TI-Nspire™ CX technology

Judy Day, Raleigh, North Carolina, United States

Patti Smith, Leonard, North Carolina, United States

For thousands of years, people have been harnessing wind energy to do work. In this session, participants will learn how wind turbines work while exploring resistance and blade pitch, number and design using the Vernier KidWind MINI Wind Turbine with Blade Design™, the Vernier Energy Sensor™ and the TI-Nspire™ CX handheld with the TI-Nspire™ Lab Cradle.

8:30 – 10 a.m.

**Haymarket
West Tower, Concourse Level**

90-minute hands-on
All levels
General Science

Using sample data to make predictions

TI-Nspire™ CX CAS technology

David Steeves, Chelmsford, Massachusetts, United States

Jackie Bonneau, North Grosvenor, Connecticut, United States

In this session, participants will explore an exercise that teaches students how to accurately estimate the population of certain fish species within a defined area. One of the most common ways to do this is through tag-and-release. For a fish population under study, wardens catch a group of the fish and tag them. The fish are then released back into the wild. Later, a new group of fish is caught or observed, and the tagged fish counted. Students will use this method to make and estimate the population of goldfish in a lake. By releasing a fixed number of tagged fish into the bowl, they will take samples and use this to estimate the total fish population. This activity uses Lists & Spreadsheet and Pie Charts.

8:30 – 10 a.m.

**Wrigley
West Tower, Concourse Level**

90-minute hands-on
Intermediate
Middle Grades Math

Coding for beginners with the TI-84 Plus Silver Edition graphing calculator

TI-84 Plus Silver Edition graphing calculator

Kristy Mann, Opelika, Alabama, United States

In this session, you'll learn the basics of programming for the TI-84 Plus CE graphing calculator in order to calculate the volume of a cylinder and solve an equation. Then, you'll be challenged to write a program of your own choosing – once you've learned a few basics. Come collaborate with colleagues as you brainstorm creative ways to use coding in the classroom.

8:30 – 10 a.m.

**Hong Kong
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Coding

Strengthening students' understanding of fractions

TI-Nspire™ App for iPad®

Tammy Jones, Lebanon, Tennessee, United States

As elementary and middle grades students develop an understanding of the number system, they must have a strong concept of fractions as numbers. In this session, we will explore a series of dynamic, interactive TI-Nspire™ simulations that will help students cultivate a deeper understanding of equivalence, ordering and operations with fractions. Using pictorial representations, students will learn how to use equivalence as a strategy to add and subtract fractions, while they apply previous understandings of multiplication and division to fractions. See how TI-Nspire™ CX technology can better prepare students for later extensions of the number system – such as rational, irrational and complex numbers.

8:30 – 10 a.m.

**Acapulco
West Tower, Ballroom Level**

90-minute hands-on
All levels
Elementary Math

Makerspace meets the TI-Nspire™ CAS App for iPad®

TI-Nspire™ CAS App for iPad®

Michelle Goetz, St. Louis, Missouri, United States

Ann Schlemper, Columbia, Missouri, United States

Two of our favorite ways to engage students – Makerspace and TI-Nspire™ CX technology – combine for a very powerful lesson about optimization. We will explore the classic box problem – and the building of prototypes, Makerspace style – thus allowing students to collaborate, create, invent and learn. This STEM investigation will continue as we examine the optimization of this problem using Math Nspired activities in order to improve the prototype. You won't want to miss this session.

8:30 – 10 a.m.

**Toronto
West Tower, Ballroom Level**

90-minute hands-on
All levels
Precalculus

Is there a statistically significant difference between the TI-84 Plus CE graphing calculator and the TI-Nspire™ CX handheld?

TI-84 Plus CE graphing calculator

Corey Boby, Benton, Arkansas, United States

Tracy Watson, Benton, Arkansas, United States

This session will explore common statistical problems involving descriptive statistics, regression and inference. Side-by-side demonstrations on the similarities and differences between the TI-84 Plus CE and the TI-Nspire™ CX handheld will be explored.

8:30 – 10 a.m.

**Atlanta
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Statistics

Let's end this year and begin a new one

TI-Nspire™ CX Navigator™ System

Alice Carson, Powell, Tennessee, United States

This session will take a look at how TI-Nspire™ CX technology can help students understand circles and all of their properties. We will also visit sum of the interior angles of a polygon in a discovery task.

8:30 – 10 a.m.

**San Francisco
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Geometry

“Let us learn guessing.” – George Polya

TI-Nspire™ CX CAS technology

William Caroscio, Elmira, New York, United States

This session will provide an opportunity to investigate some interesting problem situations made accessible to students by using dynamic geometry tools.

8:30 – 10 a.m.

**New Orleans
West Tower, Ballroom Level**

90-minute hands-on
All levels
Geometry

Discovering mathematics! “If you never did you should. These things are fun and fun is good!” – Dr. Seuss

TI-84 Plus CE graphing calculator

Kathleen McKinley, Philadelphia, Pennsylvania, United States

In this session, we’ll explore ways to promote cognitive discourse and achieve identified Common Core State Standards by investigating product packaging claims. You’ll discover how probing questions and the use of technology might be used to facilitate learning number operations and statistics across grades levels. We’ll use technology to create and analyze visual representations – box plots, histograms, probability spinners and spreadsheets – of student generated data to validate/reject product claims. You’ll also assess student understanding through extensions and transfer to new situations. Enjoy eating your manipulatives in the end!

8:30 – 10 a.m.

**Michigan 1A
East Tower, Concourse Level**

90-minute hands-on
All levels
Middle Grades Math

Supporting middle grades math standards with TI-84 Plus CE graphing calculator/ TI-83 Plus graphing calculator/TI-73 Explorer™ graphing calculator programs and activities

TI-84 Plus CE graphing calculator

Judy Wheeler, Bridgman, Michigan, United States

Marian Prince, Sawyer, Michigan, United States

Games – explorations – mastery skill-drills – concept development! In this session, we’ll explore keeping your students engaged – while also focused on attaining proficiency on the math standards – by using the many programs and activities created by the presenters. Some lessons from the TI-84 Activity Central ‘Middle Grades Math’ online resource will also be explored. Participants will interact with many of the activities; others will be demonstrated. The TI-84 Plus CE will be used during the session. Tips on using the new TI-SmartView™ CE Emulator Software for the TI-84 Plus graphing family – and the latest version of the TI Connect™ CE software application to manage your TI connected classroom – will be shared.

8:30 – 10 a.m.

**Michigan 1B
East Tower, Concourse Level**

90-minute hands-on
All levels
Middle Grades Math

Using the TI-84 Plus CE graphing calculator to teach algebra I with color

TI-84 Plus CE graphing calculator

Pam Littleton, Stephenville, Texas, United States

During this hands-on session, participants will use the TI-84 Plus CE to explore a variety of algebraic concepts to support instruction in the algebra classroom. The session will focus on ways to use color to enhance instruction.

8:30 – 10 a.m.

**Michigan 1C
East Tower, Concourse Level**

90-minute hands-on
Beginner
Algebra I

I've turned it on, now what? Getting started with TI-Nspire™ CX technology

TI-Nspire™ CX technology

Sherry Everding, St. Louis, Missouri, United States

This session introduces new users to the world of TI-Nspire™ CX technology. Come participate in activities you can bring back to students to help them gain a deeper understanding through exploring and “discovering” key mathematical concepts using multiple representations. No experience is necessary, and it’s easier than you think! Activities will touch on algebra I and beyond.

8:30 – 10 a.m.

**Michigan 2
East Tower, Concourse Level**

90-minute hands-on
Beginner
General Interest

Picture this

TI-Nspire™ CX Navigator™ System

Brad Posnanski, Pomfret, Connecticut, United States

Ellen Browne, Pomfret, Connecticut, United States

In this session, participants will use functions and relations to create whole-class graphing mosaics. Watch your classroom come alive by using collaboration, creative problem solving and student intercommunication. This activity will allow students to become inventive thinkers and apply their knowledge of graphing, while working in concert with each other. This also stimulates them to use functions and relations that are new to them. Using the TI-Nspire™ CX handheld and TI-Nspire™ CX Navigator™ System, participants will experience whole-class problem-based learning. Some elements to be presented will include transformations of functions; systems of equations; geometric figures; domains and ranges; inequalities; student communication; and whole-class collaboration.

8:30 – 10 a.m.

**Michigan 3
East Tower, Concourse Level**

90-minute hands-on
All levels
Algebra II

What? Statistics are on the redesigned SAT*?

TI-Nspire™ CX Navigator™ System

Jeff McCalla, Cordova, Tennessee, United States

Diane Broberg, Rochester, New York, United States

Statistics have crept into both algebra and geometry classes, so it shouldn’t be a surprise that the redesigned SAT* includes statistics. However, you may be surprised by the specific topics that have been included. Does your curriculum reflect these changes? Come and learn about two-way tables, conditional probability, inference, confidence intervals, shape, center and spread. Students will need to understand these concepts; to that end, we will do some hands-on activities.

8:30 – 10 a.m.

**Columbus CD
East Tower, Ballroom Level**

90-minute hands-on
Beginner
General Math

Sequencing rich mathematical tasks

TI-84 Plus CE graphing calculator

Pamela Harris, Kyle, Texas, United States

Rich tasks are cool and they help engage students, but how do you sequence them so that the tasks actually teach the math? Is that even possible? I’ll share with you how I’m sequencing important lesson structures and integrating technology so that students are constructing understanding better – while I’m telling/explaining less than I ever thought possible.

8:30 – 10 a.m.

**Columbus EF
East Tower, Ballroom Level**

90-minute hands-on
All levels
General Math

“Anatomically correct” graphs by technology

TI-84 Plus Silver Edition graphing calculator

Paul Foerster, San Antonio, Texas, United States

Accurate graphs produced by computer allow students to learn concepts by multiple methods. These include measuring with a ruler and protractor on printed copies, to graphing software on screen, to using computer algebra systems for verification of concepts learned. Participants will work with classroom-tested materials developed over the presenter’s 50-year teaching career.

8:30 – 10 a.m.

**Columbus G
East Tower, Ballroom Level**

90-minute hands-on
All levels
Precalculus

Read, apply, learn: best practices for integrating TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Jennifer Wilson, Flowood, Mississippi, United States

Jill Gough, Atlanta, Georgia, United States

How might we take action on current best practices and research in learning and assessment? What if we make sense of new ideas and learn how to apply them in our own practice? Let's learn together; deepen our understanding of formative assessment with the TI-Nspire™ CX Navigator™ System; make thinking visible using Building Concepts activities; and more. We will bring examples of actions taken to tinker with ideas from Tim Kanold, Dylan William, Jo Boaler and others, and we will discuss and share their impact on learning.

8:30 – 10 a.m.

**Columbus H
East Tower, Ballroom Level**

90-minute hands-on
All levels
Formative Assessment

Math and science exploration, discovery and project-based learning made E-A-S-Y!

TI-84 Plus CE graphing calculator

Delbra Robinson, Chesterfield Township, Michigan, United States

David Sword, Grosse Pointe, Michigan, United States

Participants in this session will investigate ideas for math and science projects using technology to collect and analyze real-time, real-world data. We'll use the Vernier EasyData™ app on the TI-84 Plus CE graphing calculator to collect various forms of data, including voltage, sound, temperature, light, distance, pH and more. This session also involves inquiry-based learning strategies that will assist teachers in developing and facilitating a learning environment where their students delve deeply into making mathematics and science connections, discoveries and fun.

8:30 – 10 a.m.

**Columbus IJ
East Tower, Ballroom Level**

90-minute hands-on
Intermediate
General Interest

STEM = high student engagement

TI-84 Plus CE graphing calculator

Sherri Abel, Greenville, South Carolina, United States

Jan Mitchener, Indianapolis, Indiana, United States

Want to ignite your classroom? Roll up your sleeves and get hands-on with STEM using the TI-84 Plus CE graphing calculator. Participants will be involved in activities that will support critical thinking in their classrooms by integrating STEM with real-world tasks.

8:30 – 10 a.m.

**Columbus KL
East Tower, Ballroom Level**

90-minute hands-on
All levels
General Interest

Calculus conference within a conference

TI-Nspire™ CX CAS technology

Tom Dick, Corvallis, Oregon, United States

Various speakers

Join us for any part of – or for the entire day – at this special conference especially for teachers of calculus. Hear from a collection of renowned speakers about issues, challenges and opportunities facing teachers of calculus. Special emphases will include the new AP* Calculus course description; transition issues facing students moving from high school to college; and ways of exploiting technology to improve student learning of calculus.

8:30 a.m. – 5 p.m.

**Regency Ballroom C
West Tower, Ballroom Level**

All-day session
All levels
Calculus

Inspired by Google Earth™ and Google™ Maps

TI-Nspire™ CX Navigator™ System

Matthew Owens, Columbia, South Carolina, United States

Jeff McCalla, Memphis, Tennessee, United States

Come explore ways to inspire students to think differently about the math that can be used to explain their world and to solve problems using TI-Nspire™ CX technology, Google Maps™ and Google Earth™. This webinar will focus on: 1. Empowering students to tackle challenges using problem-solving skills – and their TI technology – to evaluate, analyze and explain the math behind their favorite topics, and 2. Inspiring students to explore a variety of careers and the math that makes them possible.

10:15 – 11:15 a.m.

**Dusable
West Tower, Third Floor**

60-minute hands-on
Intermediate
Algebra II

Formative assessments of olympic proportions

TI-Nspire™ CX Navigator™ System

Valerie Hudson, Colleyville, Texas, United States

Are you looking for ways to incorporate engaging formative assessments into your classroom? Do you use TI-Nspire™ CX Teacher Software or the TI-Nspire™ CX Navigator™ System? If the answer to these questions is “Yes!” then this session is for you. Participants will learn how to incorporate photos, color and multiple representations in TI-Nspire™ CX documents in order to create engaging formative assessment opportunities for students. Bring your laptop with TI-Nspire™ CX Teacher Software or the TI-Nspire™ CX Navigator™ System installed, and leave with formative assessment documents ready to go for your algebra I or algebra II classes.

10:15 – 11:15 a.m.

**Field
West Tower, Third Floor**

60-minute hands-on
Intermediate
Formative Assessment

How can technology support a growth mindset?

TI-84 Plus CE graphing calculator

Nancy Johnson, Westborough, Massachusetts, United States

Participants will learn about strategies to consistently implement a growth mindset in their classrooms. Rich learning tasks will be explored using TI-84 Plus CE technology to engage students to investigate, explore, discover and discuss mathematics inside the classroom and beyond. All activities will be made available to participants including student handouts and teacher notes. Lessons will align to Common Core State Standards for grades seven through 12.

10:15 – 11:15 a.m.

**Ogden
West Tower, Third Floor**

60-minute hands-on
All levels
General Math

Making connections in trigonometry with TI-Nspire™ CX CAS technology

TI-Nspire™ CX CAS technology

Scott Knapp, Northbrook, Illinois, United States

Come view TI-Nspire™ CX technology activities that have helped create an ‘open floor plan’ in the trigonometry classroom – a place where students can make deeper connections between trigonometry lessons and units. Trigonometry topics include the unit circle, trigonometry function graphing, inverse trigonometry functions, solving trigonometry equations, the law of cosines and polar graphing. Leave the conference with calculator activities and demonstrations that are classroom-ready and proven to enhance student learning.

10:15 – 11:15 a.m.

**Wright
West Tower, Third Floor**

60-minute hands-on
All levels
Trigonometry

The power of the TI-Nspire™ CX Navigator™ System, CAS and algebra in action

TI-Nspire™ CX Navigator™ System

Anthony Record, Avon, Indiana, United States

Sean Bird, Indianapolis, Indiana, United States

Formative assessment with the TI-Nspire™ CX Navigator™ System is a powerful tool to check for and deepen understanding of mathematics. You may not realize that it has built-in CAS capabilities. Even if your students don't use the TI-Nspire™ CX CAS handheld, come see how the CAS built into TI-Nspire™ CX Navigator™ System can be leveraged. CAS can be an outstanding tool to encourage exploring and student confidence. In this session, ready-to-use activities (available at <https://sites.google.com/site/tinspiregroup/cas>) will be shared. You'll also learn about its limitations and new capabilities (to help students tackle literal equations or formula), and the practical application of what they are learning in algebra (to things like nanotechnology).

10:15 – 11:15 a.m.

**Addams
West Tower, Third Floor**

60-minute hands-on
All levels
CAS

Inspiring minds through C.O.R.E. Teacher Academy

TI-Nspire™ CX Teacher Software

Claudia Gutierrez, Edinburg, Texas, United States

Kris McKinney, Edinburg, Texas, United States

Texas Instruments and the Gear Up: Ready, Set, College! partnership grant at the Region One Education Service Center (in Edinburg, Texas) have developed a unique professional development model that provides support to math and science teachers – focused on the needs of the most at-risk students. The evolution of this model over 10 years has produced communities of effective teachers and technology-rich classroom environments, driven by the needs of students.

10:15 – 11:15 a.m.

**McCormick
West Tower, Third Floor**

60-minute lecture
All levels
Administrator

Design challenges using the TI-Innovator™ Hub with TI LaunchPad™ Board

TI-84 Plus CE graphing calculator

Fred Fotsch, Dallas, Texas, United States

Motivate your students to learn math, science, coding (programming) and engineering skills by solving real-world problems that are relevant to themselves and to their community. In this hands-on session, participants will learn the technology skills and pedagogy needed to bring problem-based learning models into their classrooms using the TI-Innovator™ System. This session will use TI-84 Plus CE graphing technology; the skills learned here are also relevant to TI-Nspire™ CX technology. Beginners welcome!

10:15 – 11:15 a.m.

**Gold Coast
West Tower, Concourse Level**

60-minute hands-on
Beginner
Coding and STEM

Stepping up STEM with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Audrey Cucci, Frankfort, New York, United States

Are you looking for ways to improve STEM instruction in your classroom? Come and work through STEM activities that you can use in your math classroom. Learn how to present these activities using TI-Nspire™ CX technology; you'll see how these STEM activities can help reach our students and get them excited about STEM careers. Come learn a few tricks on how to use these activities in a flipped classroom in order to expand student learning; let's get our students excited about STEM, together.

10:15 – 11:15 a.m.

**Water Tower
West Tower, Concourse Level**

60-minute hands-on
Intermediate
STEM/Connecting Science
and Math

Why do we have parabolic antennas? (Mathematics Florida Standards [MAFS].912.G-GPE.1.2)

TI-Nspire™ CX Navigator™ System

Cesar Lozano Diaz, Zapopan, Jalisco, Mexico

By using collaborative learning environments with the TI-Nspire™ CX Navigator™ System, the TI-Nspire™ CX handheld, a laser and aluminium foil, we will deduce how to graph a parabola. We will also deduce how to obtain its equation – enabling the making of construction plans and allowing us to create a metal structure. We will see for ourselves the importance of the focus of a parabola by simply using a shaft of light, and we will build and discuss this project – as it applies to STEM principles – to encourage significant learning in our students.

10:15 – 11:15 a.m.

**Columbian
West Tower, Concourse Level**

60-minute hands-on
Beginner
STEM/Connecting Science and Math

AP* Computer Science Principles through TI-Nspire™ CX technology and the TI-Innovator™ Hub with TI LaunchPad™ Board

TI-Nspire™ CX technology

Todd Graba, Crystal Lake, Illinois, United States

With the programming language flexibility of the new AP* Computer Science Principles course, participants in this session will learn how to use TI-Nspire™ CX technology – and the new TI-Innovator™ Hub – to help students learn programming and how to produce artifacts.

10:15 – 11:15 a.m.

**Picasso
West Tower, Concourse Level**

60-minute hands-on
All levels
Coding and STEM

Forensics: new class. New calculators. Now what?

TI-Nspire™ CX technology

Lorelei Cummings, Lufkin, Texas, United States

You're teaching forensics next year – and you're thrilled! Then you learn you will have technology you've never seen before. Now, not only do you have to select meaningful learning experiences, you also have to incorporate these calculators you don't even know how to use. This session will address how the TI-Nspire™ CX handheld and TI-Nspire™ CX Navigator™ System technology is used daily within the context of a forensics classroom – but many of the ideas will easily transfer to other disciplines. Assessments, class discussion, graphic organizers, laboratory experiments, literacy initiatives and differentiated assignments will be shared. This session will be equally beneficial for new or veteran TI-Nspire™ CX technology users, whether you're interested in the forensics, the technology, or both.

10:15 – 11:15 a.m.

**Haymarket
West Tower, Concourse Level**

60-minute lecture/demonstration
Beginner
General Science

CSI Baltimore

TI-84 Plus Silver Edition graphing calculator

Levi Straight, Baltimore, Maryland, United States

Participants in this session will use the power of the TI-84 Plus CE graphing calculator to identify relationships between various pairs of human body measurements – in order to help solve a case!

10:15 – 11:15 a.m.

**Wrigley
West Tower, Concourse Level**

60-minute hands-on
Beginner
Statistics

Basic coding for math with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Lisa Conzemius, Detroit Lakes, Minnesota, United States

This session will help you learn how to engage your students through coding in TI Basic on the TI-84 Plus CE. Coding can spark their interest in programming and help them become better problem solvers. This session will show the steps for how to get your students started with coding.

10:15 – 11:15 a.m.

**Hong Kong
West Tower, Ballroom Level**

60-minute hands-on
Beginner
Coding

M&Ms® and Bayes' theorem

TI-Nspire™ CAS App for iPad®

Deobra Solomon, Sparks, Nevada, United States

In this session, we'll take a look from middle school through AP* Probability and Statistics into the use of M&Ms® and data collection. Then, participants will look into the world of data science and the use of Bayes' Theorem to calculate data sets from the world of Big Data and the Internet of Things.

10:15 – 11:15 a.m.

**Acapulco
West Tower, Ballroom Level**

60-minute hands-on
Beginner
Statistics

Geometry goodies on the TI-Nspire™ CAS App for iPad®

TI-Nspire™ CAS App for iPad®

Jon Lepeska, Winnetka, Illinois, United States

Margaret Stetsko, Winnetka, Illinois, United States

What happens when all geometry students have the TI-Nspire™ CAS App for iPad® in their hands? In our case, it has allowed for some serious investigation, exploration and discovery. Participants will work through and discuss a few of our favorite, open-ended problems and walk away with student-tested, ready-to-use activities. (While these activities are intended for the TI-Nspire™ CAS App for iPad®, they can easily be adapted for use with handhelds.)

10:15 – 11:15 a.m.

**Toronto
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Geometry

Why do I use a TI-84 Plus CE graphing calculator in intro stats?

TI-84 Plus CE graphing calculator

Juan Manuel Gonzalez, Laredo, Texas, United States

The majority of students that enroll in my Introductory Statistics course at university have access to a TI-84 Plus CE. The others will use either a TI-Nspire™ CX handheld, a scientific calculator, a four-function calculator (yikes!) or no calculator at all (double yikes!). The versatility of its statistics features to calculate binomial probabilities, measures of central tendency, confidence intervals, areas under the Gaussian curve, Chi-square and hypothesis testing, make the TI-84 Plus CE one of the best tools available for maximizing student understanding.

10:15 – 11:15 a.m.

**Atlanta
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Statistics

Global greatness – using interactive models and calculators to determine global distances along latitudes and longitudes

TI-Nspire™ CX Navigator™ System

Brian Lannen, Yackandandah, Australia

Are we there yet? Great Circle distance calculations and global geometry are included in the measurement and geometry section of many math courses. This session shares a set of rather cool TI-Nspire™ CX Navigator™ files, student worksheets and teacher notes that are all set to use with your class.

10:15 – 11:15 a.m.

**San Francisco
West Tower, Ballroom Level**

60-minute hands-on
All levels
Geometry

All done teaching transformational geometry? Now is the time to introduce the coordinate approach

TI-Nspire™ CX CAS technology

Stephen West, Geneseo, New York, United States

Using a coordinate approach to first introduce the notions of transformational geometry is not recommended, since it can lead to memorization of rules as opposed to the understanding of concepts. However, once the fundamental ideas of transformational geometry have been learned, a coordinate approach can provide an opportunity for both further discovery and applications. In this session, we will use dynamic geometry to discover the analytic equations for the basic rigid motions, and then use these equations to extend the results to more general forms.

10:15 – 11:15 a.m.

**New Orleans
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Geometry

The TI-82 STATS graphing calculator, equity and your middle school classroom

TI-84 Plus CE graphing calculator

Veronica Ocampo, Milwaukee, Wisconsin, United States

Using the STAT and 2nd STAT PLOT keys to present essential statistical ideas to your middle school students set the stage for success in high school courses. This session is directed to sixth through eighth grade teachers seeking to broaden their students' understanding of key statistical concepts. Come join us in professional conversations around addressing equity issues – utilizing the TI-84 Plus family of graphic calculators – to create student access to foundational statistical content.

10:15 – 11:15 a.m.

Michigan 1A
East Tower, Concourse Level

60-minute hands-on
Beginner
Middle Grades Math

Can you predict the future?

TI-84 Plus Silver Edition graphing calculator

Lisa Bendall, Key West, Florida, United States

Have you ever wondered if past winning times for Olympic Games events are a predictor of future performance? With the popularity of the Olympic Games and the level of competition present, is the trend of champions' times throughout the years, in certain events, a linear relationship? How strong a correlation is there between the individual winning times? If the data appears non-linear, is there a more precise model that can be determined from a scatterplot of the data? Attendees will take data from Olympic Games events and determine the answers to these questions, and more, during this session. Participants will leave with materials for implementation into their own classrooms.

10:15 – 11:15 a.m.

Michigan 1B
East Tower, Concourse Level

60-minute hands-on
Intermediate
Algebra I

Functions and fun in math I with parachuting Lego® men

TI-Nspire™ CX Navigator™ System

Julie Riggins, Kernersville, North Carolina, United States

Trying to find real-world applications and fun activities to engage math I students can be a challenge. In this activity, you will video a parachuting Lego® man and then plot his height, frame-by-frame, as he falls. What's going to happen? Will he reach terminal velocity? Can you use a piecewise function to model his descent? What would the pieces be? Can this Lego® man intrigue you and my math I students? Join the experiment and find out.

10:15 – 11:15 a.m.

Michigan 1C
East Tower, Concourse Level

60-minute hands-on
Intermediate
Algebra I

My favorite “real-world” problems

TI-Nspire™ CX Navigator™ System

Heidi Rudolph, Pepper Pike, Ohio, United States

In this session, we will look at the braking distance of a car with our newest, young drivers; ladder safety in the work place; and other short mini-tasks with “real-world” applicability.

10:15 – 11:15 a.m.

Michigan 2
East Tower, Concourse Level

60-minute hands-on
Beginner
Algebra II

Orchestrating low floor, high ceiling tasks

TI-Nspire™ CX Navigator™ System

Sam Gough, Atlanta, Georgia, United States

In this session, tasks that allow students easy entry – but can build to complex ideas and multiple solutions – will be investigated. The tasks will be facilitated using Smith and Stein's five practices for orchestrating productive mathematics.

10:15 – 11:15 a.m.

Michigan 3
East Tower, Concourse Level

60-minute hands-on
All levels
Algebra II

Let's grow our best muscle ... the brain

TI-84 Plus CE graphing calculator

Corina Srygley, Amarillo, Texas, United States

Our brains grow more when we struggle and wrestle with rich problems. Come to this session and check out resources and activities that we can use in our classroom to help students become better thinkers and problem solvers.

10:15 – 11:15 a.m.

Columbus CD
East Tower, Ballroom Level

60-minute hands-on
All levels
General Math

Data collection: it's not just for the science classroom anymore

TI-Nspire™ CX Navigator™ System

Ed Roberts, Columbus, Ohio, United States

Doug Roberts, Hilliard, Ohio, United States

Science teachers have been using data collection in their classrooms for a long time. Now is a perfect time for math teachers to use the power of data collection to help their students understand different mathematics concepts. In this hands-on session, participants will use various sensors to collect and analyze data from a math and science perspective. Some of the sensors that will be used are the Calculator-Based Ranger 2™ (CBR 2™) motion sensor, the stainless steel temperature probe and the dual range force sensor.

10:15 – 11:15 a.m.

**Columbus EF
East Tower, Ballroom Level**

60-minute hands-on
Beginner
General Math

Overcoming obstacles to make mathematics work for each and every student

Matt Larson, Lincoln, Nebraska, United States

In order to raise the achievement of students and simultaneously close learning differentials, we must overcome the obstacles that have traditionally stood in the way of mathematics working for students. This session will engage participants in examining the six principles of highly effective mathematics programs, as outlined in the National Council of Teachers of Mathematics's document, "Principles to Actions"; look at the action steps necessary to overcome these obstacles; and offer strategies for how we can better communicate to parents and other stakeholders what meaningful mathematics learning looks like today (and why it is important).

10:15 – 11:15 a.m.

**Columbus G
East Tower, Ballroom Level**

60-minute lecture
All levels
General Interest

Beautiful math

TI-Nspire™ CX Navigator™ System

Sarada Toomey, Las Vegas, Nevada, United States

Participants in this session will be able to use TI's STEM Behind Hollywood activities to create lessons to reinforce linear and exponential functions. We will go from beautiful people to dead people, zombies to destroying the earth.

10:15 – 11:15 a.m.

**Columbus H
East Tower, Ballroom Level**

60-minute lecture/demonstration
All levels
General Math

Building Concepts: statistics in middle school and algebra I

TI-Nspire™ CX Navigator™ System

Katie England, Westminster, Maryland, United States

Is the analysis of one- and two-variable data sets new to a course you teach? Some statistical concepts have shifted grades or courses with Common Core State Standards implementation. How can we use research to build deep understanding of these statistics concepts? How will we provide rich tasks that support student proficiency in these statistics standards and mathematical practices? We'll dig deep into what learning progressions tell us about how students learn one- and two-variable statistics. We'll also explore statistics standards in middle grades courses – and in algebra I – with Building Concepts activities using TI-Nspire™ CX technology.

10:15 – 11:15 a.m.

**Columbus IJ
East Tower, Ballroom Level**

60-minute hands-on
All levels
Middle Grades Math

SySTEMs of discovery

TI-Nspire™ CX and TI-Nspire™ CX CAS technology

Tina Alhashimi, Collinwood, Tennessee, United States

Discovery is such an integral part of STEM education. This session will promote student and teacher cross-curricular exploration of STEM education, and spotlight a STEM classroom where concepts are not taught individually, but as a collection of connected things forming a complex whole. The presenter will share how students can learn through an integrated, hands-on and context-rich learning environment, by making, tinkering, coding, building, testing, collaborating and sharing.

10:15 – 11:15 a.m.

**Columbus KL
East Tower, Ballroom Level**

60-minute lecture
All levels
General Interest

Ciphers and coding

TI-Nspire™ CX CAS technology

Jody Crothers, Safety Bay, Australia

Codes and ciphers have been used for centuries to create secure messages. This session will explore various ciphers using paper-based and technology-based activities. By the end of the session, you will be able to create programs to encode and decode messages – for the secret agent in all of us.

11:30 a.m. – 12:30 p.m.

Dusable
West Tower, Third Floor

60-minute hands-on
All levels
Coding

Learning math with your TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Manuel Antonio Montero Gaona, Bogota, Colorado, Colombia

Julian Ricardo Gomez Niño, Bogota, Colombia

This session will examine how to teach math programming using the TI-84 Plus CE. You will learn to create programs to solve systems of equations (to graph from a program), and solve problems algorithmically with the use of this powerful calculator.

11:30 a.m. – 12:30 p.m.

Field
West Tower, Third Floor

60-minute hands-on
Beginner
General Math

From problem solvers to problem posers – taking students deeper into correlation with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Ashley Sergi, Ashville, Ohio, United States

Rachael Gorsuch, Gahanna, Ohio, United States

Is your GPA related to the amount of video games you play? In this session, we will explore student-centered correlation activities that promote inquiry and gather data. We will use TI-Nspire™ CX technology to analyze the data and draw conclusions based on the results. No experience is necessary. You will leave this session with a ready-to-use lesson that can be applied at any grade level.

11:30 a.m. – 12:30 p.m.

Horner
West Tower, Third Floor

60-minute hands-on
Intermediate
Statistics

Formative assessment in the TI-Nspire™ CX Navigator™ System classroom

TI-Nspire™ CX Navigator™ System

Richard Smith, Warren, Michigan, United States

Formative assessments are the key to understanding what students understand in the classroom. The TI-Nspire™ CX Navigator™ System can be used to assess what students know in a quick and efficient manner, and this data can help drive your instruction. This presentation will show how to seamlessly integrate several different types of formative assessments, and how to use the data that they generate.

11:30 a.m. – 12:30 p.m.

Ogden
West Tower, Third Floor

60-minute hands-on
Intermediate
Formative Assessment

Exploring parametric representation with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Richard Parr, Houston, Texas, United States

Alice Fisher, Houston, Texas, United States

Participants will explore the use of parametric representations, and consider strategies that help students make connections and improve understanding of important function concepts in second-year algebra and precalculus.

11:30 a.m. – 12:30 p.m.

Wright
West Tower, Third Floor

60-minute lecture/demonstration
All levels
Precalculus

I know I should, but how can I start? The Computer Algebra System

TI-Nspire™ CX CAS technology

Tom Fox, Houston, Texas, United States

Want to get started using the computer algebra system (CAS) on your TI-Nspire™ CX CAS technology? This is the session to get a hands-on intro to CAS. We'll also talk about some guided discovery CAS activities you can use with your algebra students – and how the use of the CAS might impact evaluation.

11:30 a.m. – 12:30 p.m.

**Addams
West Tower, Third Floor**

60-minute hands-on
Beginner
CAS

CAS-ing up the conics with the TI-Nspire™ CX CAS handheld

TI-Nspire™ CX Navigator™ System

Steve Phelps, Cincinnati, Ohio, United States

Participants will take advantage of the computer algebra and 3-D graphing capabilities of the TI-Nspire™ CX CAS handheld to explore questions about conics that aren't typically addressed – but should be – in the high school classroom. Stop by and get the complete picture of the conics.

11:30 a.m. – 12:30 p.m.

**McCormick
West Tower, Third Floor**

60-minute hands-on
Intermediate
CAS

Embedding coding and engineering design into engaging math lessons with the TI-Innovator™ Hub with TI LaunchPad™ Board

TI-84 Plus CE graphing calculator

Michelle Rinehart, Midland, Texas, United States

Toni Norrell, Robstown, Texas, United States

Plug-and-play and ready-to-use with TI graphing calculators, the TI-Innovator™ Hub enables students to learn basic coding and design; use those skills to program and build working solutions; and connect science, technology, engineering and math (STEM) concepts. Come experience engaging, hands-on math lessons that leverage the power of the TI-Innovator™ Hub for taking STEM to the next level. In this session, we'll explore how this device can change the way students experience and perceive mathematics. No prior programming experience is necessary.

11:30 a.m. – 12:30 p.m.

**Gold Coast
West Tower, Concourse Level**

60-minute hands-on
Beginner
Coding and STEM

Putting mathematics back into STEM

TI-Nspire™ CX Navigator™ System

Rodney Anderson, Wynnum, Australia

How many helium balloons does it take to lift a koala? How fast can you hit a table tennis ball? How fast does a fan rotate? An education in STEM fosters a sense of enquiry, promotes quantitative skills and develops different ways of thinking. In this session, we'll explore various STEM activities; collect data using a range of sensors (microphone, light, motion and force); and then analyze it using TI technology.

11:30 a.m. – 12:30 p.m.

**Water Tower
West Tower, Concourse Level**

60-minute hands-on
All levels
STEM/Connecting Science
and Math

Our journey to a STEM collaboration with TI-Nspire™ CX technology

TI-Nspire™ CX technology

Angela Principato, St. Clair Shores, Michigan, United States

Paul Voydanoff, St. Clair Shores, Michigan, United States

What started as a lighthearted joke – that the math department “must not be teaching slope” – grew into a multi-year collaboration among the math and science teachers in a small high school. Our journey began with shared vocabulary and consistent variable use. It has grown to the use of TI-Nspire™ CX handhelds and Vernier Software & Technology™ probes for inquiry in both math and science classrooms. Join us as we share our journey to a meaningful STEM collaboration via TI-Nspire™ CX handhelds. We'll discuss how we overlap content as much as possible; how we use the calculators for bellwork and remediation; and how the Vernier Software & Technology™ probes – in conjunction with the handheld – have transformed the collection and analysis of real-world data in our math and science classes.

11:30 a.m. – 12:30 p.m.

**Columbian
West Tower, Concourse Level**

60-minute lecture
Beginner
STEM/Connecting Science
and Math

Coding simulations to solve math problems

TI-Nspire™ CX technology

Marc Garneau, Surrey, British Columbia, Canada

Coding can be a powerful problem-solving strategy, as one can get a sense of a solution which may enlighten a more direct approach. In this session, we'll explore some probability and other problems, as well as use coding to run a simulation.

11:30 a.m. – 12:30 p.m.

Picasso
West Tower, Concourse Level

60-minute hands-on
Intermediate
Coding and STEM

The gravity of the matter

TI-Nspire™ CX technology

Ian Galloway, Southampton, United Kingdom

Deriving the acceleration due to gravity – from measurements made in the classroom – has never been so easy. This hands-on workshop will show you how easy it is to measure gravity, and go on to use the motion sensor as a weighing machine. Time permitting, we will explore the use of dynamic geometry and PhET to show how energy is conserved in a vertically oscillating system. Ordinarily, this is not so easy – with kinetic, gravitational and elastic energies all interchanging. Bungee jumpers beware!

11:30 a.m. – 12:30 p.m.

Haymarket
West Tower, Concourse Level

60-minute hands-on
Intermediate
Physics

Party time, “Common Core” style

TI-Nspire™ CX technology

Scott Washburn, Redlands, California, United States

Edward Chaves, Miami, Florida, United States

In this session, we will endeavor to calculate how expensive it would be to throw a party in compound function-type format – taking into account the number of tables, chairs, waiters and square feet of the venue. We will demonstrate how to do this with both TI-Nspire™ CX technology as well as the TI-84 Plus CE graphing calculator.

11:30 a.m. – 12:30 p.m.

Wrigley
West Tower, Concourse Level

60-minute hands-on
Beginner
Algebra II

Visualizing one-variable linear inequalities – plus a behind the scenes look at creating number line graphs

TI-Nspire™ CX technology

Ray Fox, Mt. Juliet, Tennessee, United States

Ruth Casey, Frankfurt, Kentucky, United States

How can we use technology to help students visualize inequalities such as $x < 2$? Or $x^3 < 3$? In this session, we will use a TI-Nspire™ file to graph inequalities on a number line. There's more! Participants will have a behind-the-scenes look at the .tns file as they create a document that uses scatter plots, sliders and conditional statements to display number line graphs. Step-by-step instructions and completed .tns files will be provided.

11:30 a.m. – 12:30 p.m.

Hong Kong
West Tower, Ballroom Level

60-minute hands-on
Advanced
Coding

Explore projectile motion with the TI-Nspire™ CAS App for iPad®

TI-Nspire™ CAS App for iPad®

Marsha Guntharp, West Palm Beach, Florida, United States

Fred Browning, West Palm Beach, Florida, United States

By videotaping flying balls and then using an iPad® app to track the flight for use in a TI-Nspire™ CX graphs page, session participants will model the flight path with quadratic and parametric equations.

11:30 a.m. – 12:30 p.m.

Acapulco
West Tower, Ballroom Level

60-minute hands-on
Beginner
Algebra II

Nspired iPad® activities for your struggling geometers

TI-Nspire™ App for iPad®

Chris Moody, Clayton, Missouri, United States

Kyle McCord, Clayton, Missouri, United States

The iPad® is a great option for visualization and hands-on exploration of geometric concepts and relationships. In this session, we will share iPad® based activities, focusing on points of concurrency and indirect measurement, targeted toward struggling students.

11:30 a.m. – 12:30 p.m.

**Toronto
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Geometry

AP* Statistics: type II error and the power of a test

TI-84 Plus CE graphing calculator

Mike Koehler, Kansas City, Missouri, United States

Come to this session to explore the necessary background and activities that can be effectively used in the classroom to teach type II error and the power of a test. Participants will get hands-on experience using simulations that model effective classroom use of technology, as well as activities that have been effectively used in AP* Statistics classes. The topic is difficult for students, and some teachers have a difficult time explaining the concept to students. This workshop will address both concerns.

11:30 a.m. – 12:30 p.m.

**Atlanta
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Statistics

Exploring equations and relationships with TI-Nspire™ CX technology in junior high math

TI-Nspire™ CX Navigator™ System

Sarah Bauguss, Katy, Texas, United States

Participants will experience activities – using the TI-Nspire™ CX handheld and TI-Nspire™ CX Navigator™ System – that will build student understanding of the expressions, equations and relationships Texas Essential Knowledge and Skills (TEKS) strand. Participants will leave with ideas for how to use this technology in the 5Es instructional model, and with the knowledge of where to find resources.

11:30 a.m. – 12:30 p.m.

**San Francisco
West Tower, Ballroom Level**

60-minute hands-on
Intermediate
Middle Grades Math

Exploring constructions with the Cabri™ Jr. geometry app in the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Naomi Kokason, Chatsworth, California, United States

Let's explore how to use the compass tool in the Cabri™ Jr. geometry app to have students make constructions in their TI-84 Plus CE. We will also explore other uses for this app in geometry.

11:30 a.m. – 12:30 p.m.

**New Orleans
West Tower, Ballroom Level**

60-minute hands-on
Beginner
Geometry

Double your productivity at TI-Nspire™ CX technology!

TI-Nspire™ CX CAS technology

Mehmet Altundal, Sydney, Australia

In this session, we will focus on the features that will make TI-Nspire™ CX technology users more productive. We'll cover the different memory types such as documents, problems, pages, functions, programs and different types of variables. Your students will love these tips and shortcuts.

11:30 a.m. – 12:30 p.m.

**Michigan 1A
East Tower, Concourse Level**

60-minute lecture/demonstration
Beginner
Middle Grades Math

The Tortoise and the Hare: multi-method problem solving using the TI-84 Plus family of graphing calculators

TI-84 Plus CE graphing calculator

Mark Drago, Prides Crossing, Massachusetts, United States

Who will win – the tortoise or the hare? This classic race problem can be represented using equations, graphs and parametric functions. Using the TI-84 Plus family of graphing calculators can aid students as they assess how to approach this and other similar-related rate problems. Along with using the TI-84 Plus CE graphing calculator, this workshop will also look at how to structure students for success in tackling this problem.

11:30 a.m. – 12:30 p.m.

Michigan 1B
East Tower, Concourse Level

60-minute hands-on
Beginner
Algebra I

Daily warm ups in the algebra I classroom

TI-Nspire™ CX Navigator™ System

Jessica Esquibel, Albuquerque, New Mexico, United States

Come see how I use the TI-Nspire™ CX Navigator™ System for daily warm ups in my algebra I classroom. We will look at estimation, patterns, comparisons, functions and more! Walk away with ideas you can use in your classroom tomorrow.

11:30 a.m. – 12:30 p.m.

Michigan 1C
East Tower, Concourse Level

60-minute hands-on
All levels
Algebra I

Algebraic inverses and the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Kimberley Thomas, Phoenix, Arizona, United States

Veronica Carlson, Phoenix, Arizona, United States

Using conversion formulas for temperature as a starting point, we will examine ways to work with algebraic inverses in this session. Participants will work with lists, scatter plots, regressions and the draw inverse feature as we reason abstractly and quantitatively. We'll also look for and express regularity in repeated reasoning.

11:30 a.m. – 12:30 p.m.

Michigan 2
East Tower, Concourse Level

60-minute hands-on
Beginner
Algebra II

The future: 1-1 ratio classroom and the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Antoinette Kidwell, Alexandria, Virginia, United States

The push for a 1-1 ratio classroom has amplified the use of online, interactive formative assessments. However, despite the proliferation of ready-made online assessments, there is still a need to tailor them to direct classroom discussions. This presentation will demonstrate the practical and important use of TI-84 Plus CE color graphics (with Adobe® Captivate® and other online resources) in the preparation of effective online assessments (in the analysis of polynomial and higher-order equations, and end behaviors of algebraic functions).

11:30 a.m. – 12:30 p.m.

Michigan 3
East Tower, Concourse Level

60-minute lecture/demonstration
All levels
Algebra II

Setting the stage to engage the struggling learner

TI-84 Plus Silver Edition graphing calculator

Melinda Wilder, Cartersville, Georgia, United States

Oftentimes, the key to helping a struggling learner is to engage the student in exciting, relevant, and interesting content and instruction. Teachers have the desire to engage, but sometimes lack the resources. Student engagement does not have to be expensive and time consuming. During this session, teachers will have the opportunity to explore multiple engagement strategies – and proven classroom techniques – that will engage all students, regardless of ability levels.

11:30 a.m. – 12:30 p.m.

Columbus CD
East Tower, Ballroom Level

60-minute lecture
Beginner
General Math

Explorations using the TI-Nspire™ CX Navigator™ System

TI-Nspire™ CX Navigator™ System

Patrick Sanchez, Goliad, Texas, United States

Abigail Sanchez, Goliad, Texas, United States

In this session, participants will experience how the TI-Nspire™ CX Navigator™ System can help students explore mathematical concepts. The system allows the teacher to become a facilitator when learning new concepts, and it encourages students to take ownership of their learning. This session will include activities from algebra I to calculus.

11:30 a.m. – 12:30 p.m.

**Columbus EF
East Tower, Ballroom Level**

60-minute hands-on
Intermediate
General Math

Strategies and tasks to build procedural fluency from conceptual understanding

Diane Briars, Pittsburgh, Pennsylvania, United States

Procedural fluency – skill in carrying out arithmetic and algebraic procedures flexibly, accurately, efficiently and appropriately – is an important component of mathematical proficiency. Yet despite our best efforts, many students fail to develop such fluency. Connecting procedures to underlying concepts is essential for building fluency. This session answers the questions: “What tasks and strategies help students build fluency from conceptual understanding?” and “What common pitfalls should I avoid?”

11:30 a.m. – 12:30 p.m.

**Columbus G
East Tower, Ballroom Level**

60-minute lecture
All levels
General Interest

Prepare2Nspire

Lesia Covington Clarkson, Woodbury, Minnesota, United States

Come explore the Prepare2Nspire program during this session. Prepare2Nspire is a near-peer tutoring/mentoring program that is preparing underserved students in algebra. These learning communities (LC) are formed with one undergraduate, three high school juniors and six eighth-grade students. The communities are exploring algebraic thinking and learning with the use of TI-Nspire™ CX technology. Participants in the LCs learn how to use the TI-Nspire™ CX handheld from TI instructors who visit annually. Then throughout the academic year, this technology is used by the students in their classrooms across the Twin Cities. Parents and teachers report that these students have been transformed as mathematics learners. Students report higher confidence in themselves as math learners because of the technology and relationships formed in their LC.

11:30 a.m. – 12:30 p.m.

**Columbus H
East Tower, Ballroom Level**

60-minute lecture
All levels
General Interest

High-stakes testing – help! The TI-Nspire™ CX handheld to the rescue

TI-Nspire™ CX Navigator™ System

Beth Smith, Jacksonville, Florida, United States

When students use graphing calculators frequently, they tend to score higher on national-, state- and school-level tests. Efficient use of the TI-Nspire™ CX handheld on high-stakes tests – such as the SAT*, ACT*, AP* and IB® exams – can help students achieve their goals. During the school year, the TI-Nspire™ CX handheld should be used by students to verify results, make discoveries and see connections. This workshop will cover tips and tricks that will help students effectively use the TI-Nspire™ CX handheld on high-stakes tests.

11:30 a.m. – 12:30 p.m.

**Columbus KL
East Tower, Ballroom Level**

60-minute hands-on
All levels
General Interest

Tips and tricks for authoring TI-Nspire™ CX Teacher Software documents

TI-Nspire™ CX Teacher Software

Mark Arguijo, San Benito, Texas, United States

Would you like to create your own interactive documents for your students to explore? Have you ever wondered how some of the pre-made documents on the Math Nspired web site were made? Attend this session and get your students motivated and excited with documents you’ve created yourself. Come learn how to use sliders, conditional statements and TI Basic programming to make your own short, interactive documents. We’ll make those tough-to-teach, tough-to-learn concepts come alive.

1:45 – 3:15 p.m.

**Dusable
West Tower, Third Floor**

90-minute hands-on
Intermediate
Authoring

Navigating formative assessment

TI-Nspire™ CX Navigator™ System

Sherri Phegley, Sugar Land, Texas, United States

Tori Soto, San Antonio, Texas, United States

In this session, participants will learn how to create and use formative assessments on the TI-Nspire™ CX handheld and TI-Nspire™ CX Navigator™ System to drive their instruction and improve their students' understanding. Participants will also learn to create their own quick polls and self-check documents – bring your flash drive!

1:45 – 3:15 p.m.

Field
West Tower, Third Floor

90-minute hands-on
Intermediate
Formative Assessment

Fractions: beyond pizza

TI-15 Explorer™ elementary calculator

Chris Ruda, Miami, Florida, United States

Marsha Burkholder, Columbus, Ohio, United States

Chicago pizza? Great for eating! But This lively, hands-on workshop will look beyond pizza to explore meaningful fraction models. Discover how the TI-15 Explorer™ elementary calculator builds conceptual and procedural understanding of fractions. Participants will engage in and practice rich tasks that integrate the unique features of TI technology, digital content and manipulatives. Activities and related discourse will provide specific examples of Mathematics Teaching Practices for all students, as outlined in the National Council of Teachers of Mathematics' "Principles to Actions."

1:45 – 3:15 p.m.

Horner
West Tower, Third Floor

90-minute hands-on
Beginner
Elementary Math

Simulate this!: inference for dummies (without the formal test)

TI-84 Plus Silver Edition graphing calculator

Eric Sever, Marietta, Georgia, United States

Both Common Core and traditional statistics courses ask students to interpret simulations. Luckily, they are now easy to do. Participants in this session will actively execute some simulations that can be done with both AP* and on-level students. In this session, easy-to-set-up classroom activities will be presented; the activities are designed so that students develop a better understanding of more abstract ideas (like p-values), instead of memorizing algorithms. Hands-on simulations will be executed first, then technology will be integrated into this session.

1:45 – 3:15 p.m.

Ogden
West Tower, Third Floor

90-minute hands-on
All levels
Statistics

Making music with math

TI-Nspire™ CX Navigator™ System

Molly Rockstroh, De Pere, Wisconsin, United States

Come to this session and experience an exciting, fun and classroom-ready precalculus activity in modeling with trigonometry functions. Participants will use Vernier Software & Technology™ microphones and the Vernier DataQuest™ application for TI-Nspire™ CX technology to create musical notes that will culminate in a group concert.

1:45 – 3:15 p.m.

Wright
West Tower, Third Floor

90-minute hands-on
Intermediate
Precalculus

FUNctional art for algebra II and precalculus

TI-Nspire™ CX Navigator™ System

Ellen Piekarski, Killeen, Texas, United States

Alexis Jensen, Killeen, Texas, United States

My students "love" this semester project, wherein they transform parent functions covered in upper-level math classes. I will cover the ins and outs of getting started – both with and without the TI-Nspire™ CX Navigator™ System – including clicking and dragging to transform some functions; how to change the appearance of lines; and how to limit most functions – even vertical lines. Get 100s of ready-to-go student files, as well as quick reference sheets and examples of rubrics I have used in the past.

1:45 – 3:15 p.m.

Addams
West Tower, Third Floor

90-minute hands-on
Intermediate
Precalculus

Using TI-Nspire™ CX CAS technology to see beauty and harmony in high school mathematics

TI-Nspire™ CX Navigator™ System

Peter Flynn, Kyneton, Australia

Disallowing student use of CAS in high school mathematics places limitations on a student's mathematical experience. In this workshop, we will present a set of CAS-required activities that afford high school mathematics students the opportunity to experience and understand some wonderful mathematical results that would normally be out of reach. Topics covered include functions, algebra and calculus. In exploiting the power of TI-Nspire™ CX CAS technology to delve more deeply, we hope to raise the importance of the role of parameters in determining function behaviour; the ability to correctly interpret outputs derived from CAS; and the need to foster student mathematical reasoning when using a CAS device. No previous TI-Nspire™ CX CAS technology knowledge will be assumed, or is required, for this session.

1:45 – 3:15 p.m.

**McCormick
West Tower, Third Floor**

90-minute hands-on
All levels
CAS

Bot Cars and BASIC

TI-84 Plus Silver Edition graphing calculator

JoAnn Miltenberg, Farmingdale, New York, United States

In this session, we'll explore an introduction to TI Basic programming and calculator controlled robot cars. We'll use NASA's "Calculator-Controlled Robots" workbook activities for hands-on mathematics and science discovery, and we'll write programs accessing the built-in TI Basic – enabling the TI-84 Plus CE graphing calculator to act as a remote control for the "CarBot."

1:45 – 3:15 p.m.

**Gold Coast
West Tower, Concourse Level**

90-minute hands-on
Beginner
Coding and STEM

What to do if you only have one pressure probe!

TI-84 Plus Silver Edition graphing calculator

Gregory Williams, Norfolk, Virginia, United States

In this session, we'll explore a couple of experiments you can do even if you have only one pressure probe. We'll explore pressure versus depth – for water, and pressure versus temperature – for air.

1:45 – 3:15 p.m.

**Water Tower
West Tower, Concourse Level**

90-minute hands-on
Beginner
STEM/Connecting Science and Math

STEAM camp: functional art

TI-84 Plus CE graphing calculator

Ann Schlemper, Columbia, Missouri, United States

Kara Leaman, Tolono, Illinois, United States

Come learn how 24 fifth through eighth grade students came together for a week of STEAM activities – in which their major goal was to construct chairs out of cardboard. In the process, campers got the opportunity to learn about art, physics, chemistry, mathematics and computer programming. In this session, you'll hear about the camp. You'll additionally get an opportunity to do some programming on the TI-84 Plus CE graphing calculator, as well as explore the TI-Innovator™ Hub with TI LaunchPad™ Board.

1:45 – 3:15 p.m.

**Columbian
West Tower, Concourse Level**

90-minute lecture/demonstration
All levels
STEM/Connecting Science and Math

Engineering and the TI-Innovator™ Hub with TI LaunchPad™ Board

TI-Nspire™ CX Navigator™ System

Ellen Browne, Pomfret, Connecticut, United States

Cassie Whitecotton, Ft. Worth, Texas, United States

Using the TI-Nspire™ CX handheld and the new TI-Innovator™ Hub, come create working solutions using the principles of engineering design. Activities that encourage students to build, design and test projects that explore life and physical science will be presented.

1:45 – 3:15 p.m.

**Picasso
West Tower, Concourse Level**

90-minute hands-on
All levels
Coding and STEM

My favorite chemistry activities

TI-Nspire™ CX Navigator™ System

Ray Lesniewski, Chicago, Illinois, United States

Learn about some of my favorite and teacher-created Nspired chemistry activities. In this session, you will explore the topics of measurement, accuracy versus precision, density, stoichiometry, intermolecular forces and kinetics. This will be achieved through hands-on, minds-on work using the temperature sensor and the colorimeter.

1:45 – 3:15 p.m.

**Haymarket
West Tower, Concourse Level**

90-minute hands-on
Beginner
Chemistry

Data collection and analysis – the Chromebook™ notebook computer vs. TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Charles Smith, Sunbury, Ohio, United States

Michael Smith, Westerville, Ohio, United States

Participants in this session will gather and analyze data using both TI-Nspire™ CX technology and the Chromebook™ notebook computer. The advantages and disadvantages of each of the two popular systems will be experienced by the users.

1:45 – 3:15 p.m.

**Wrigley
West Tower, Concourse Level**

90-minute hands-on
Intermediate
Physics

Coding with the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Michelle Bonds, Bald Knob, Arkansas, United States

This session will show you how to use your TI-84 Plus CE to incorporate coding in your math class, and deepen understanding of mathematical concepts. No experience is required and all lessons will be available to take back to your classroom.

1:45 – 3:15 p.m.

**Hong Kong
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Coding

Building a bridge from fractions to ratios and proportions

TI-Nspire™ App for iPad®

Tammy Jones, Lebanon, Tennessee, United States

“The study of ratios and proportional relationships extends students’ work in measurement and in multiplication and division in the elementary grades.” Participants will explore the differences and similarities between ratios and fractions, as well as the connections between ratios and prior work with multiplication, division and measurement. See how using the kinesthetic and visual qualities of the TI-Nspire™ App for iPad® technology can support building ratio sense with attention to quantities and change. The shift from the consideration of quantities in relative terms – rather than absolute terms – and the shift from additive reasoning to multiplicative reasoning will be investigated.

1:45 – 3:15 p.m.

**Acapulco
West Tower, Ballroom Level**

90-minute hands-on
All levels
Middle Grades Math

TI STEM playroom: hands-on STEM solutions for your classroom

TI-Nspire™ App for iPad®

Stephen Arnold, Swansea, Australia

Want to create an affordable STEM-active classroom, get your students started with coding, explore and design solutions to practical problems, and make sense of the world through live, real-world data? Texas Instruments offers a range of affordable, classroom-ready tools and resources designed to help students (from middle grades through seniors) get started with STEM – and then apply what they have learned. In this session, we’ll explore activities including 10 Minutes of Code; designing a greenhouse (and within minutes, monitoring it from the cloud); building a BLE ultrasonic motion detector; and using an accelerometer to control an athlete. Come join us and get a taste of what accessing these free, online classroom resources for STEM could mean for your students.

1:45 – 3:15 p.m.

**Toronto
West Tower, Ballroom Level**

90-minute hands-on
All levels
STEM/Connecting Science
and Math

The Dam Project: how I fit project-based learning into my AP* Calculus curriculum

TI-84 Plus Silver Edition graphing calculator

Jana Forck, Jefferson City, Missouri, United States

Shelly Angerer, Jefferson City, Missouri, United States

How can I get my students to connect calculus concepts? Can I get them to make real-world connections? How will I ever have time to have my students complete projects? In this session, we will explore “The Dam Project,” “Electric Circuits and a Light Seeking Robot,” and “The Pipes That Didn’t Meet” (a problem from my husband’s workplace). I will also explain what I did to manage time and how I fit the projects into my curriculum. Bring your TI-84 Plus CE graphing calculator and/or TI-Nspire™ CX handheld to help explore the calculus involved in these projects.

1:45 – 3:15 p.m.

Atlanta
West Tower, Ballroom Level

90-minute lecture/demonstration
All levels
Calculus

Mapping rules – plural

TI-Nspire™ CX Navigator™ System

Travis Bower, Goleta, California, United States

OK, so you know how to use the Geometry Transformation tools, but you want to add the ability to transform with mapping rules to your repertoire. For example, $(x, y) \rightarrow (x+5, y-6)$ would be a translation. But how does one go about graphing a polygon and its transformation from a mapping rule? Come to this session and find out. We will also explore two projects: one that utilizes transformation tools, and one that employs multiple mapping rules to create a complex transformation.

1:45 – 3:15 p.m.

San Francisco
West Tower, Ballroom Level

90-minute lecture/demonstration
Intermediate
Geometry

Blended learning and TI-Nspire™ CX activities

TI-Nspire™ CX technology

Kim Zeydel, Meridian, Idaho, United States

TI-Nspire™ activities work well with blended learning. Starting with the standards and/or concepts you want to cover in your blended classroom, you can find ready-made activities to meet your needs as well as those of your students. This session will cover how to incorporate geometry activities from TI with a blended learning classroom, or any classroom.

1:45 – 3:15 p.m.

New Orleans
West Tower, Ballroom Level

90-minute hands-on
Intermediate
Geometry

Visualizing structure and helping students think

TI-Nspire™ CX Navigator™ System

Angela Melnyk, Fort Leavenworth, Kansas, United States

Martin Sanchez, Houston, Texas, United States

How many of your students struggle to understand solving equations? In this session, you will get hands-on experience with learning models that help students visualize the arithmetic structure of expressions. These models will help build conceptual knowledge as students use technology – not only to help them visualize structure, but also to help them develop thinking skills and find solutions for equations.

1:45 – 3:15 p.m.

Michigan 1A
East Tower, Concourse Level

90-minute hands-on
All levels
Middle Grades Math

Using simulations to engage seventh through 10th graders in statistics

TI-Nspire™ CX Navigator™ System

Sharon Bruce, Colorado Springs, Colorado, United States

Kymn Van Dyken, Raynesford, Montana, United States

Attendees will explore how to use simulations to engage students’ interest and deepen their understanding of statistical concepts. We’ll investigate several real-world scenarios that can be simulated with a hands-on approach, and then expanded with TI-Nspire™ CX technology. With the Common Core emphasis on seventh graders making statistical inferences from their simulation results, these ready-to-go activities will be applicable for both middle school and high school classrooms.

1:45 – 3:15 p.m.

Michigan 1B
East Tower, Concourse Level

90-minute hands-on
Beginner
Middle Grades Math

My social footprint

TI-Nspire™ CX Navigator™ System

Leanne Barbour, Martinsville, Virginia, United States

How can I use Facebook® and other social media outlets to help my students analyze data? This session will look at a project to collect likes from a post on social media, and on the data analysis that students can do. Box and Whisker plots, linear regression and other data models will be used, and your TI-84 Plus family graphing calculator/TI-Nspire™ CX technology can come along for the ride.

1:45 – 3:15 p.m.

Michigan 1C
East Tower, Concourse Level

90-minute hands-on
Beginner
Algebra I

Modeling mathematics with TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Katie Martinez, Encinitas, California, United States

Daniel Ilaria, Chester Springs, Pennsylvania, United States

One of the mathematical practices students should engage in is “Model with Mathematics.” In this session, we will examine the meaning of this practice and engage in tasks that promote modeling in algebra classes using the TI-Nspire™ CX platform. Participants will discuss how multiple representations help create flexible mathematical modelers in the classroom.

1:45 – 3:15 p.m.

Michigan 2
East Tower, Concourse Level

90-minute hands-on
All levels
Algebra I

Action-consequence activities: using TI-84 Plus CE technology to make math stick

TI-84 Plus CE graphing calculator

Karen Campe, New Canaan, Connecticut, United States

In this hands-on workshop, participants will learn strategies for leveraging TI-84 Plus CE graphing calculators to guide students toward deeper mathematical understanding. You’ll perform mathematical actions with technology and ask targeted questions to optimize students’ reasoning about the mathematical implications. Come explore classroom-ready, dynamic activities with multiple representations that build concepts in algebra, geometry and precalculus. Then engage your students in productive discussions that promote higher-level thinking and support the Common Core mathematical practices.

1:45 – 3:15 p.m.

Michigan 3
East Tower, Concourse Level

90-minute hands-on
All levels
Algebra II

Using TI-Nspire™ CX technology to clarify the understanding of geometric transformations

TI-Nspire™ CX technology

Zalman Usiskin, Winnetka, Illinois, United States

Ray Klein, Glen Ellyn, Illinois, United States

The Common Core State Standards for Mathematics (CCSSM) require that transformations be an essential part of the geometry curriculum. Even if you do not agree with the CCSSM overall, the presenters think you should agree with this aspect of the CCSSM. In this session, we show how TI-Nspire™ CX technology enables the use of geometric transformations to deepen student understanding of functions, congruence and similarity, and of the transformations themselves. (For the hands-on portion of this session, some facility with the Cabri™ Jr. geometry app on TI-Nspire™ CX technology is suggested.)

1:45 – 3:15 p.m.

Columbus CD
East Tower, Ballroom Level

90-minute hands-on
Intermediate
Geometry

Breaking the code: creatively integrate algebra, geometry and cryptology

TI-Nspire™ CX technology

Tom Reardon, Poland, Ohio, United States

In this session, we'll explore having your grades eight through 12 students utilize innovative problem-solving strategies and learn about secret codes to mathematically solve an intriguing mystery. This engaging activity can be solved "by hand" – using algebra and geometry – or it can be enhanced by using the graphing and geometry apps on the TI-Nspire™ CX handheld, TI-Nspire™ CX software or TI-Nspire™ App for iPad® (we suggest doing both!). Topics used in the solution include geometric rotations; electronic patty paper; applying slope; writing equations of lines; midpoints; perpendicular bisectors; creating and solving linear systems; and interpreting solutions. Join one of the activity's authors to learn about cryptology, how to use it to capture your students interest and how use it in the mathematics they are learning.

1:45 – 3:15 p.m.

**Columbus EF
East Tower, Ballroom Level**

90-minute hands-on
Beginner
General Math

Leveraging technology into great tasks

TI-Nspire™ CX CAS technology

Connie Schrock, Emporia, Kansas, United States

In this session, we'll explore great tasks. What are the components of a great task? A great task engages students with an interesting problem involving essential content. It seeks to build deep understanding of concepts, support rich discourse and provide the opportunity for students to persevere with the problem. If a task is great, then technology alone does not solve it – nor does technology replace thinking. Rather, learning is enhanced when we leverage classroom technology to guide students to deeper understanding. Come explore how this could look with a great task.

1:45 – 3:15 p.m.

**Columbus G
East Tower, Ballroom Level**

90-minute lecture/demonstration
All levels
General Interest

Reasoning from data: the path to inference

TI-Nspire™ CX technology

Gail Burrill, East Lansing, Michigan, United States

New standards call for beginning inferential reasoning in the middle grades, and informal inferential statistics in high school – with an emphasis on simulation. How can this play out across grades? What key concepts are important in this pathway? And how does technology help develop the necessary understandings – in particular, using activities from Building Concepts: Statistics and Probability? Also, what are the implications for AP*? Come to this session to explore these topics.

1:45 – 3:15 p.m.

**Columbus H
East Tower, Ballroom Level**

90-minute hands-on
All levels
Statistics

TI-Nspire™ CX CAS technology for modelling, analysis and application of mathematical concepts in STEM

TI-Nspire™ CX CAS technology

Sanjeev Meston, Berwick, Victoria, Australia

Participants in this session will focus on analysing mathematical concepts and applying the conceptual understanding to STEM subjects. We will model daylight hours at any location using circular functions (science and geography); maximising volume (engineering); and will consider mathematical models of exponential growth and decay in the field of sciences. We will also explore volume and gravimetric analysis in chemistry. All participants will be provided with a wide range of files and activities. They can easily be used in the classroom to further the understanding of concept-based mathematics and its integration with STEM subjects.

3:30 – 5 p.m.

**Dusable
West Tower, Third Floor**

90-minute hands-on
All levels
STEM/Connecting Science and Math

The TI-Nspire™ CX Navigator™ System for intermediate users

TI-Nspire™ CX Navigator™ System

Daryl Ewry, Dallas, Texas, United States

Jaryn Ingram, Dallas, Texas, United States

Once you have your TI-Nspire™ CX Navigator™ System set up – and you've started using it in class – it's time to extend your learning and see what you can really do with it. The TI-Cares™ team will demonstrate intermediate-level usage, tips and tricks to help you maximize the impact of the TI-Nspire™ CX Navigator™ System in your classroom.

3:30 – 5 p.m.

**Field
West Tower, Third Floor**

90-minute hands-on
Intermediate
General Interest

TI-84 Plus CE graphing calculators and algebra readiness go hand-in-hand

TI-84 Plus CE graphing calculator

Cynthia Cuellar Rodriguez, Milwaukee, Wisconsin, United States

Algebra ... is not just a course in high school! Algebraic reasoning and understanding grows through the grades. Join us in this interactive session as we engage in activities to promote algebra readiness in grades five through eight. We will share our district's definition and framework through which to view the teaching and learning of algebraic reasoning. Come engage in professional conversations around using handhelds to enhance students' understanding of key algebraic concepts.

3:30 – 5 p.m.

**Horner
West Tower, Third Floor**

90-minute hands-on
Beginner
Elementary Math

Using the TI-84 Plus Silver Edition graphing calculator to enhance assessment performance

TI-84 Plus Silver Edition graphing calculator

Kathy Hale, Abilene, Texas, United States

Preparing students for state assessments is different from the type of instruction used to develop conceptual understanding. This session will focus on narrowing the use of a handheld to make students more comfortable with assessments.

3:30 – 5 p.m.

**Ogden
West Tower, Third Floor**

90-minute hands-on
All levels
Assessment

Seeing electricity, does the light really go off and on 120 times each second?

TI-84 Plus Silver Edition graphing calculator

James Hus, Highland, Indiana, United States

Tracie Mezera, Highland, Indiana, United States

In this session, learn how students in the lab can investigate the voltage output found in a wall electricity outlet. Using the TI-84 Plus CE graphing calculator, a Calculator-Based Laboratory™ (CBL™) data collection device, the electrical probe and a common cell phone charger, students will obtain voltage versus time data. Data will then be analyzed using a sinusoidal regression and the student will determine the amplitude and period of the resulting periodic function. This lab activity investigates the calculus concept of average value of a function and the resulting average voltage output of their electrical device. But amazingly, they will verify with a high degree of accuracy that the period of their wave is one-sixtieth of a second, matching the frequency for the U.S. power supply. They will see the voltage output drop to zero twice, and “see” electricity on their graph.

3:30 – 5 p.m.

**Wright
West Tower, Third Floor**

90-minute hands-on
Intermediate
Precalculus

Using CAS to understand the behavior of rational functions and asymptotes

TI-Nspire™ CX CAS technology

Sheri Stayton, Lewisburg, Pennsylvania, United States

Participants will engage in an activity where they will use CAS to change the algebraic form of rational functions using the proper fraction and common denominator commands on the TI-Nspire™ CX CAS handheld. Looking at rational functions in different algebraic forms will reveal important information about graphical behavior. This activity will challenge common misconceptions about asymptotes and reveal that it is unnecessary to memorize rules to determine the asymptotic behavior of functions. Connections between rational expressions and rational numbers will also be discussed.

3:30 – 5 p.m.

**Addams
West Tower, Third Floor**

90-minute hands-on
All levels
CAS

When will we ever use this?

Scott Oliver, Lincolnshire, Illinois, United States

Math students often question why they need to learn certain math topics, especially when they (sometimes correctly) think that they will never use these concepts in their “real lives.” In this session, we will focus on actual (and some humorous) math applications in movies, TV, literature, legal trials, sports, puzzles and games, etc. Many resources will be discussed and demonstrated – and many are available from Texas Instruments websites. Our main goal is to provide teachers with many examples to help motivate students in STEM areas.

3:30 – 5 p.m.

**McCormick
West Tower, Third Floor**

90-minute lecture/demonstration
All levels
General Interest

Promoting holistic student engagement in the science classroom

TI-Nspire™ CX Navigator™ System

David Young, Fayetteville, Arkansas, United States

Yuridia Gandy, Edinburg, Texas, United States

In this session, we will highlight the importance of using TI technology as part of a “holistic engagement” approach. Come to understand engagement with an activity as being represented by good behavior (i.e., behavioral engagement); positive feelings (i.e., emotional engagement); and, above all, student thinking (i.e., cognitive engagement). We will use coding and the TI-Innovator™ Hub with TI LaunchPad™ Board as the canvas to facilitate our conversation.

3:30 – 5 p.m.

**Gold Coast
West Tower, Concourse Level**

90-minute lecture/demonstration
Beginner
Coding and STEM

Let games begin ... the Orion Exploration Design Challenge

TI-Nspire™ CX Navigator™ System

Cassie Whitecotton, Fort Worth, Texas, United States

Dan Kennedy, Tucson, Arizona, United States

Learn how to engage students in real-world problem solving through engineering design problems and challenges. Various materials and probes will be used to meet the specific needs of the Orion Exploration Design Challenge. The TI-Nspire™ CX Navigator™ System will be used for data collection and management.

3:30 – 5 p.m.

**Water Tower
West Tower, Concourse Level**

90-minute hands-on
All levels
STEM/Connecting Science
and Math

STEM in a math classroom? You betcha!

TI-Nspire™ CX Navigator™ System

Ron Armontrout, Oxford, Maine, United States

Bring real-world problem solving to your students in all levels of math and science using the TI-Nspire™ CX handheld and Calculator-Based Ranger™ (CBR™) motion sensor to investigate bi-variant data for motion. Various techniques will be used in this session to fit mathematical models to the data; and linear, piecewise and absolute value functions will be explored. This workshop is designed to address the Common Core mathematics modeling standard.

3:30 – 5 p.m.

**Columbian
West Tower, Concourse Level**

90-minute hands-on
Intermediate
STEM/Connecting Science
and Math

Integrating engineering design into the math classroom

TI-Nspire™ CX Navigator™ System

Ellen Browne, Pomfret, Connecticut, United States

Irina Lyublinskaya, Staten Island, New York, United States

Come to this hands-on workshop to learn how engineering design can enhance your mathematics classroom and engage your students in meaningful problem solving. Explore the new TI-Innovator™ Hub with TI LaunchPad™ Board along with TI-Nspire™ CX technology. Ready-to-use handouts will be available.

3:30 – 5 p.m.

**Picasso
West Tower, Concourse Level**

90-minute hands-on
All levels
Coding and STEM

Addressing the math in the Next Generation Science Standards

TI-Nspire™ CX CAS technology

Tami Plein, Burlington, Iowa, United States

Mathematical and Computational Thinking is one of the Science and Engineering Practices of the Next Generation Science Standards (NGSS). Come explore how that might look in the high school science classroom. Teachers will work through several examples of mathematical tasks expected of students in high school classrooms – implementing the new science standards using TI technology. Using the graphing calculator can help students understand phenomena in nature by allowing them to visualize the relationship between the graphs and symbolic forms of their collected data. The integration of math, science, technology and problem solving creates a great STEM experience for students.

3:30 – 5 p.m.

**Haymarket
West Tower, Concourse Level**

90-minute hands-on
Beginner
General Science

Engaging activities in probability and statistics with a focus on literacy

TI-84 Plus CE graphing calculator

Kevin Lutz, Philadelphia, Pennsylvania, United States

In this session, we'll explore activities for grades six through 12 that will engage students in thinking, speaking, writing and analyzing problems in probability and statistics. Your students will improve on and develop deeper mathematical understanding, literacy and confidence. Topics will range from basic probability to advanced statistics, and are integrated with TI technology, arithmetic, algebra and geometry. Formative assessment, project-based learning, exploration and discovery are some of the highlighted teaching methods. To be shared are learning techniques, strategies and best practices from 15 years of experienced teaching – these are the foundations of the activities. Teachers who are looking for engaging activities – with any level of experience – should consider attending.

3:30 – 5 p.m.

**Wrigley
West Tower, Concourse Level**

90-minute lecture/demonstration
All levels
Statistics

Put the power of the TI-Nspire™ CX handheld in your students' hands

TI-Nspire™ CX Navigator™ System

Sandra Hocutt, Powderly, Texas, United States

In this session, learn how students can explore, investigate and discover the truths of math using the TI-Nspire™ CX handheld.

3:30 – 5 p.m.

**Hong Kong
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Algebra I

Are you a square or a rectangle?

TI-Nspire™ App for iPad®

Marsha Burkholder, Columbus, Ohio, United States

Chris Ruda, Miami, Florida, United States

In this hands-on elementary session, participants will use the fraction feature in the TI-Nspire™ files on an iPad®. Participants will work with fractional concepts to create a measurement tool to explore whether they are a square or a rectangle. This session is for beginners who are just starting to use TI-Nspire™ CX technology and an iPad®.

3:30 – 5 p.m.

**Acapulco
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Elementary Math

Next generation transformational geometry

TI-Nspire™ CX technology

Brandon Grell, San Antonio, Texas, United States

Technology is constantly changing and so are our students. The main difference is that our kids are keeping up ... but are you? Come experience a more in-depth look at transformational geometry by way of the latest and greatest TI activities and add-ons – using vectors and specific properties – and then take your students' learning to the next level using the latest technology. We will look into the use of videos, augmented reality and will show off a few other hidden treasures.

3:30 – 5 p.m.

**Toronto
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Geometry

STEM and statistics

TI-84 Plus CE graphing calculator

Diane Broberg, Rochester, New York, United States

Jeff McCalla, Memphis, Tennessee, United States

This session will use statistics to investigate a STEM experiment. You'll build a catapult as a team and then use your structure to collect data. The data will then be analyzed using a variety of one-variable statistics. Finally, the catapults will be compared using hypothesis testing. The TI-84 Plus CE graphing calculator platform will be used to analyze the data.

3:30 – 5 p.m.

**Atlanta
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Statistics

The TI-84 Plus family of graphing calculators supports mathematical content as mathematical practices

TI-84 Plus CE graphing calculator

Rebecca Caison, Mebane, North Carolina, United States

Attendees will explore using the TI-84 Plus family of graphing calculators to engage students in becoming more proficient in standards for mathematical practice, while meeting the goals of the mathematical content. We will examine one or more high-level tasks to meet the goals of this session.

3:30 – 5 p.m.

**San Francisco
West Tower, Ballroom Level**

90-minute hands-on
Beginner
Algebra I

Stronger geometry learners lead to higher test scores: using discovery/inquiry in geometry to make your classroom come alive

TI-Nspire™ CX Navigator™ System

Jason Willcoxon, Bexley, Ohio, United States

Have you fallen into the trap of telling your students mathematical truths, instead of having them discover/inquire about them? Do you feel like there is simply too much content to cover, and that discovery would take too long? Would you like your students to come alive in the classroom and make connections between topics? If so, I'd love to share what has worked in my classroom, which has produced outstanding test scores and student engagement. We'll look at how to explore geometric truths using TI-Nspire™ CX technology. Then, we'll justify the geometry with logic/reasoning/algebra. We'll also look at Euclid's Pythagorean Theorem proof and Lunes (Alhazan, Hippocrates and Arbelos). They are wonderful examples of geometry/algebra through the lens of exploration.

3:30 – 5 p.m.

**New Orleans
West Tower, Ballroom Level**

90-minute hands-on
Intermediate
Geometry

Walk this way: using Calculator-Based Ranger™ (CBR™) motion sensors to generate authentic learning experiences

TI-84 Plus Silver Edition graphing calculator

Amanda Kinney, Texarkana, Texas, United States

Jennifer Klar, Texarkana, Texas, United States

Creating authentic experiences for students to draw back on can jump start learning in the classroom. Using the TI-84 Plus CE graphing calculator and CBR™ system, students will learn how their walk can affect the graph of a line. They will learn the concept of how their speed, direction and starting place will change the way the graph looks on the screen. Students will then be able to connect this experience to begin to learn about slope and y-intercept. This concrete knowledge can then be recalled throughout the development of these two concepts.

3:30 – 5 p.m.

**Michigan 1A
East Tower, Concourse Level**

90-minute hands-on
All levels
Middle Grades Math

Why doesn't my graph look right? Analyzing student misconceptions in data analysis

TI-Nspire™ CX Navigator™ System

Kathy Traylor, Mt. Pleasant, South Carolina, United States

Rachael Smilowitz, Charleston, South Carolina, United States

Creating graphs and doing middle-grades statistical calculations with TI-Nspire™ CX technology is easy, but there are many common misconceptions that students will make, and many questions that you will answer. Come and find out the answers to these questions and more: "Why is my box plot symmetrical when I know my data is not?" "Why don't I have Q1 on my box plot?" "What makes this point an outlier?" "Can I create a circle graph from this data?" "Why are my circle graph sections all the same size?" "Why is this a scatter plot and not a histogram?" "What's the difference between a dot plot and a dot chart?" "How can I easily calculate the mean?" "How can I adjust the bars on my histogram?" Come to this session and view student projects; investigate how they learned from their misconceptions!

3:30 – 5 p.m.

**Michigan 1B
East Tower, Concourse Level**

90-minute hands-on
Beginner
Middle Grades Math

Making mathematical connections through representations using the TI-84 Plus CE graphing calculator

TI-84 Plus CE graphing calculator

Jane T. Barnard, Milledgeville, Georgia, United States

Debate continues – reflected in some states’ standards and observable classroom practices – as to whether or not graphing handhelds can or should be used in mathematics classrooms. Across the years, I have witnessed the power of visualization; the deeper mathematical understandings when connections are made among various representations of a concept; and greater proficiency with pencil-and-paper skills by using graphing handhelds. For me, it is “mathematically criminal” to disallow the learning/teaching of mathematics without them. Examples of using technology and other representations that promote connections to pencil-and-paper skills will be shared, including factoring, solving linear equations/inequalities, and systems of equations/inequalities.

3:30 – 5 p.m.

**Michigan 1C
East Tower, Concourse Level**

90-minute hands-on
All levels
Algebra I

Functions, equation solving and order of operations in week one of algebra I

TI-Nspire™ CX Navigator™ System

Mike Lutz, Bakersfield, California, United States

In this session, we’ll discuss our use of “Number Tricks” to teach order of operations, complex equation solving and functions in the first week or two of algebra I. Our classroom uses the TI-Nspire™ CX Navigator™ System, but any scientific calculator will work as we all magically wind up with the same number – well, not all of the time. It’s an activity that can be brought back up at appropriate times throughout the course to help students connect to prior knowledge.

3:30 – 5 p.m.

**Michigan 2
East Tower, Concourse Level**

90-minute hands-on
All levels
Algebra I

De-mystify the ACT* math test with the TI-84 Plus Silver Edition graphing calculator

TI-84 Plus Silver Edition graphing calculator

Michael Dorsey, Florissant, Missouri, United States

This session will highlight and discuss examples of many questions that frequently appear on the ACT* math test. We will use several programs on the TI-84 Plus family of graphing calculators to find solutions to ACT* math problems much more quickly than it would take to solve them using other methods. This will help to build students’ confidence as well as their ability to attempt more questions and complete the test. We will also discuss the use of “GROUPS” on TI technology to help students select the programs most useful to them, based on their abilities and needs.

3:30 – 5 p.m.

**Michigan 3
East Tower, Concourse Level**

90-minute hands-on
All levels
General Interest

Breakout EDU meets TI-Nspire™ CX technology

TI-Nspire™ CX Navigator™ System

Tracy Wingert, Le Mars, Iowa, United States

Participants in this session will play a Breakout EDU game designed for an algebra I class. It may be helpful to bring along a laptop or tablet.

3:30 – 5 p.m.

**Columbus CD
East Tower, Ballroom Level**

90-minute hands-on
All levels
Algebra I

Boot camp: survival skills for TI-Nspire™ CX technology

TI-Nspire™ CX technology

Melanie Mason, Deer Park, Texas, United States

Bernice Wolf, Deer Park, Texas, United States

Join us to build up your students’ survival skills (student performance) on summative assessments using the TI-Nspire™ CX handheld. Come learn proven instructional strategies that enable student growth and understanding of algebra I in regular, co-teach and resource classes. Participants will engage in hands-on activities and come away with workable notes and time-saving instructional tips.

3:30 – 5 p.m.

**Columbus EF
East Tower, Ballroom Level**

90-minute hands-on
Beginner
General Math

SLUG fest: Super Lua users group

TI-Nspire™ CX Navigator™ System

Stephen Arnold, Swansea, Australia

This session is offered for intermediate-to-advanced Lua users (“Super” Lua users). If you have been honing your Lua skills and would like to be part of the ongoing development of this exciting part of the TI-Nspire™ CX technology solution, come to this forum and contribute suggestions and ideas. Bring your own laptop and take the next steps in enhancing your Lua expertise.

3:30 – 5 p.m.

Columbus G
East Tower, Ballroom Level

90-minute hands-on
Advanced
Coding

Flipping the TI-84 Plus CE graphing calculator classroom – year two: practical advice for getting started and making the transition

TI-84 Plus CE graphing calculator

Andrea Mika, New Orleans, Louisiana, United States

After flipping my algebra I and algebra II classrooms, I’ve come find out why it’s become my preferred method of teaching. Using TI’s scientific calculators; the TI-84 Plus family of graphing calculators; TI-Nspire™ CX CAS App for iPad®; and TI-SmartView™ Emulator for TI-Nspire™ Technology – along with video capture software – my students are not only more engaged in the classroom, but they are voluntarily exploring more outside of the classroom. I will answer questions about the best ways to get started; how to get students and parents on board; free versus paid software and resources; and much more.

3:30 – 5 p.m.

Columbus H
East Tower, Ballroom Level

90-minute hands-on
Beginner
General Interest

Did you know your TI-84 Plus CE graphing calculator and TI-84 Plus CE graph features could do this?

TI-84 Plus CE graphing calculator

Margo Lynn Mankus, Beacon, New York, United States

In this session, participants will explore the powerful Graph-Table mode as a problem-solving tool. Come experience all that this mode offers, including function editing, graphs, plots, table and lists in one view. We’ll use interactive drawing features such as horizontal and vertical lines to support understanding. We’ll also view these TI-84 Plus family graphing calculator features enhanced with color on the TI-84 Plus CE.

3:30 – 5 p.m.

Columbus IJ
East Tower, Ballroom Level

90-minute hands-on
Beginner
General Interest

Seven for seven Seven high-impact presentations on key topics in education

Various speakers

Join us for a fast-paced, information-packed session as seven motivating speakers present seven inspiring topics for seven minutes each. Topics include: “Student-centered Teacher-facilitated Engaging-minds Math-science (aka STEM)” – Speaker: Sherri Abel; “Demo Friday: Challenging Students to Question and Problem Solve” – Speaker: Todd Morstein; “Helping Student Conceptual Understanding Soar to New Heights” – Speaker: Valerie Hudson; “Teaching Through ‘EDOC’” – Speaker: Paul Alves; “A World Without Teachers” – Speaker: Stephanie Ogden; “Who’s Doing the Math?” – Speaker: Marc Garneau; and “Transforming Into Our Teacher Leader Selves” – Speaker: Michelle Rinehart.

3:30 – 5 p.m.

Columbus KL
East Tower, Ballroom Level

90-minute lecture/demonstration
Beginner
General Interest

A stylized white line-art graphic of a city skyline with various building shapes, positioned behind the main text.

*Come learn.
Go teach.*

#T3IC

Sunday Session Details

AP* Calculus from those in the know

Vicki Carter, Florence, South Carolina, United States

Stephen Davis, Davidson, North Carolina, United States

Craig Wright, Princeton, New Jersey, United States

Tom Dick, Corvallis, Oregon, United States

Learn about Advanced Placement (AP*) Calculus from those in the know during this special panel presentation. Engage with the Chief Reader for AP* Calculus, members of the AP* Test Development Committee and a representative of the College Board as they discuss challenges and opportunities for AP* Calculus educators and what teachers should be doing to get their students ready for AP* exams.

8:30 – 10 a.m.

**Columbus GH
East Tower, Ballroom Level**

90-minute lecture/demonstration
All levels

Statistics through the vertical curriculum

Landy Godbold, Atlanta, Georgia, United States

Deborah Hughes Hallett, Tucson, Arizona, United States

Penny Smeltzer, Austin, Texas, United States

Gail Burrill, East Lansing, Michigan, United States

This session will highlight a learning progression for statistics – beginning with important concepts in middle school and how those ideas are revisited in high school and in AP* Statistics. The panelists will discuss the importance of distributions; the roles of shape, center and spread in statistical reasoning; why we need random samples; and how statistical ideas are used in real contexts.

8:30 – 10 a.m.

**Columbus CD
East Tower, Ballroom Level**

90-minute lecture/demonstration
All levels

Using technology alongside slow math to promote productive struggle

Jill Gough, Atlanta, Georgia, United States

Jennifer Wilson, Brandon, Mississippi, United States

One of the Mathematics Teaching Practices from the National Council of Teachers of Mathematics' (NCTM) "Principles to Actions" is to support productive struggle in learning mathematics.

This session will address:

- » How does TI technology promote productive struggle?
- » How might we provide #SlowMath opportunities for all students to notice and question?
- » How do activities that provide for visualization and conceptual development of mathematics help students think deeply about mathematical ideas and relationships?

8:30 – 10 a.m.

**Columbus AB
East Tower, Ballroom Level**

90-minute lecture/demonstration
All levels

A stylized white line-art graphic of a city skyline with various building shapes, positioned behind the main text.

*Come learn.
Go teach.*

#T3IC

Presenter Index

Presenter Index

A

Name	Subject	Day	Time	Location
Abel, Sherri	General Interest	Saturday	8:30 – 10 a.m.	Columbus KL, East Tower, Ballroom Level
Abel, Sherri	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Adsit, Lynn	General Interest	Friday	10 – 11:30 a.m.	Columbus H, East Tower, Ballroom Level
Alhashimi, Tina	General Interest	Saturday	10:15 – 11:15 a.m.	Columbus KL, East Tower, Ballroom Level
Allred, Gina	Algebra I	Friday	10 – 11:30 a.m.	Michigan 1C, East Tower, Concourse Level
Altundal, Mehmet	Middle Grades Math	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 1A, East Tower, Concourse Level
Alves, Paul	Formative Assessment	Friday	10 – 11:30 a.m.	Ogden, West Tower, Third Floor
Alves, Paul	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Anderson, Rodney	STEM/Connecting Science and Math	Saturday	11:30 a.m. – 12:30 p.m.	Water Tower, West Tower, Concourse Level
Angerer, Shelly	Calculus	Saturday	1:45 – 3:15 p.m.	Atlanta, West Tower, Ballroom Level
Antinone, Linda	Algebra II	Friday	3:15 – 4:15 p.m.	Columbus G, East Tower, Ballroom Level
Antinone, Linda	STEM/Connecting Science and Math	Saturday	8:30 – 10 a.m.	Water Tower, West Tower, Concourse Level
Arguijo, Mark	Authoring	Saturday	1:45 – 3:15 p.m.	Dusable, West Tower, Third Floor
Armontrout, Ron	CAS	Friday	3:15 – 4:15 p.m.	Addams, West Tower, Third Floor
Armontrout, Ron	STEM/Connecting Science and Math	Saturday	3:30 – 5 p.m.	Columbian, West Tower, Concourse Level
Arnold, Stephen	STEM/Connecting Science and Math	Saturday	1:45 – 3:15 p.m.	Toronto, West Tower, Ballroom Level
Arnold, Stephen	Coding	Saturday	3:30 – 5 p.m.	Columbus G, East Tower, Ballroom Level
Ashurst, John	General Math	Friday	10 – 11:30 a.m.	Columbus CD, East Tower, Ballroom Level
Ashurst, Johnny	Elementary Math	Friday	2 – 3 p.m.	Horner, West Tower, Third Floor
Ashurst, Johnny	Coding	Friday	3:15 – 4:15 p.m.	Hong Kong, West Tower, Ballroom Level
Atkin, Kyle	Statistics	Friday	10 – 11:30 a.m.	Atlanta, West Tower, Ballroom Level
Bambrick, Margaret	Algebra I	Friday	10 – 11:30 a.m.	Michigan 1B, East Tower, Concourse Level
Barbour, Leanne	Algebra I	Saturday	1:45 – 3:15 p.m.	Michigan 1C, East Tower, Concourse Level
Barnard, Jane T.	Algebra I	Saturday	3:30 – 5 p.m.	Michigan 1C, East Tower, Concourse Level
Barton, Christy	STEM/Connecting Science and Math	Friday	3:15 – 4:15 p.m.	Columbian, West Tower, Concourse Level

B

Presenter Index

Name	Subject	Day	Time	Location
Barton, Ray	General Math	Friday	2 – 3 p.m.	Columbus EF, East Tower, Ballroom Level
Bauguss, Sarah	Middle Grades Math	Saturday	11:30 a.m. – 12:30 p.m.	San Francisco, West Tower, Ballroom Level
Belcher, Elizabeth	General Science	Friday	2 – 3 p.m.	Haymarket, West Tower, Concourse Level
Bellman, Allan	Algebra II	Friday	3:15 – 4:15 p.m.	Columbus G, East Tower, Ballroom Level
Bellman, Allan	STEM/Connecting Science and Math	Saturday	8:30 – 10 a.m.	Water Tower, West Tower, Concourse Level
Bendall, Lisa	Algebra I	Saturday	10:15 – 11:15 a.m.	Michigan 1B, East Tower, Concourse Level
Benzon, Maria	Middle Grades Math	Friday	12:45 – 1:45 p.m.	Michigan 1A, East Tower, Concourse Level
Beth, Damion	Formative Assessment	Friday	2 – 3 p.m.	Ogden, West Tower, Third Floor
Bickett, Christine	Formative Assessment	Friday	10 – 11:30 a.m.	Columbus G, East Tower, Ballroom Level
Bird, Sean	CAS	Saturday	10:15 – 11:15 a.m.	Addams, West Tower, Third Floor
Boby, Corey	Statistics	Saturday	8:30 – 10 a.m.	Atlanta, West Tower, Ballroom Level
Bonds, Michelle	Coding	Saturday	1:45 – 3:15 p.m.	Hong Kong, West Tower, Ballroom Level
Bonneau, Jackie	Middle Grades Math	Saturday	8:30 – 10 a.m.	Wrigley, West Tower, Concourse Level
Bonneau, Jacklyn	General Science	Friday	10 – 11:30 a.m.	Haymarket, West Tower, Concourse Level
Bower, Travis	Geometry	Saturday	1:45 – 3:15 p.m.	San Francisco, West Tower, Ballroom Level
Boyd, Richard	Algebra II	Friday	3:15 – 4:15 p.m.	Acapulco, West Tower, Ballroom Level
Brandt, Kimberly	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Columbian, West Tower, Concourse Level
Briars, Diane	General Interest	Saturday	11:30 a.m. – 12:30 p.m.	Columbus G, East Tower, Ballroom Level
Broberg, Diane	General Math	Saturday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
Broberg, Diane	Statistics	Saturday	3:30 – 5 p.m.	Atlanta, West Tower, Ballroom Level
Browne, Ellen	Algebra II	Saturday	8:30 – 10 a.m.	Michigan 3, East Tower, Concourse Level
Browne, Ellen	Coding and STEM	Saturday	1:45 – 3:15 p.m.	Picasso, West Tower, Concourse Level
Browne, Ellen	Coding and STEM	Saturday	3:30 – 5 p.m.	Picasso, West Tower, Concourse Level
Browning, Fred	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Acapulco, West Tower, Ballroom Level
Bruce, Sharon	Middle Grades Math	Saturday	1:45 – 3:15 p.m.	Michigan 1B, East Tower, Concourse Level

Presenter Index

Name	Subject	Day	Time	Location
Burkholder, Marsha	Elementary Math	Friday	12:45 – 1:45 p.m.	Horner, West Tower, Third Floor
Burkholder, Marsha	Elementary Math	Saturday	1:45 – 3:15 p.m.	Horner, West Tower, Third Floor
Burkholder, Marsha	Elementary Math	Saturday	3:30 – 5 p.m.	Acapulco, West Tower, Ballroom Level
Burrill, Gail	Statistics	Saturday	1:45 – 3:15 p.m.	Columbus H, East Tower, Ballroom Level
Burrill, Gail		Sunday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
Byer, Becky	Coding	Saturday	8:30 – 10 a.m.	Field, West Tower, Third Floor
Cable, Vicki	Algebra I	Friday	12:45 – 1:45 p.m.	Michigan 1C, East Tower, Concourse Level
Caines, Michael	CAS	Friday	10 – 11:30 a.m.	Addams, West Tower, Third Floor
Caison, Rebecca	Algebra I	Saturday	3:30 – 5 p.m.	San Francisco, West Tower, Ballroom Level
Campe, Karen	Algebra II	Saturday	1:45 – 3:15 p.m.	Michigan 3, East Tower, Concourse Level
Carlson, Veronica	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 2, East Tower, Concourse Level
Caroscio, William	Geometry	Saturday	8:30 – 10 a.m.	New Orleans, West Tower, Ballroom Level
Carr, Lauren	Calculus	Friday	3:15 – 4:15 p.m.	Ogden, West Tower, Third Floor
Carson, Alice	Geometry	Saturday	8:30 – 10 a.m.	San Francisco, West Tower, Ballroom Level
Carter, Vicki	Calculus	Friday	12:45 – 1:45 p.m.	Columbus CD, East Tower, Ballroom Level
Carter, Vicki		Sunday	8:30 – 10 a.m.	Columbus GH, East Tower, Ballroom Level
Casey, Ruth	Algebra I	Friday	10 – 11:30 a.m.	Michigan 1B, East Tower, Concourse Level
Casey, Ruth	Coding	Saturday	11:30 a.m. – 12:30 p.m.	Hong Kong, West Tower, Ballroom Level
Casey, Tammy	Coding and STEM	Friday	12:45 – 1:45 p.m.	Picasso, West Tower, Concourse Level
Casey, Tammy	General Math	Friday	2 – 3 p.m.	Field, West Tower, Third Floor
Chan, Yew Fook	Calculus	Friday	2 – 3 p.m.	McCormick, West Tower, Third Floor
Chapman, Louise	General Science	Friday	10 – 11:30 a.m.	Haymarket, West Tower, Concourse Level
Chatman, Monique	Assessment	Saturday	8:30 – 10 a.m.	Ogden, West Tower, Third Floor
Chaves, Edward	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Wrigley, West Tower, Concourse Level
Ciarelli, Michael	STEM/Connecting Science and Math	Friday	10 – 11:30 a.m.	Water Tower, West Tower, Concourse Level
Cichocki, Sharon	Algebra I	Friday	3:15 – 4:15 p.m.	Michigan 2, East Tower, Concourse Level

C

Presenter Index

Name	Subject	Day	Time	Location
Cocharo, John	Calculus	Friday	12:45 – 1:45 p.m.	Field, West Tower, Third Floor
Cockburn, Karen	General Interest	Friday	12:45 – 1:45 p.m.	Dusable, West Tower, Third Floor
Collins, Ken	Precalculus	Friday	3:15 – 4:15 p.m.	McCormick, West Tower, Third Floor
Conzemius, Lisa	Coding	Saturday	10:15 – 11:15 a.m.	Hong Kong, West Tower, Ballroom Level
Corn, Jeff	Precalculus	Friday	12:45 – 1:45 p.m.	Wright, West Tower, Third Floor
Covington Clarkson, Lesa	General Interest	Saturday	11:30 a.m. – 12:30 p.m.	Columbus H, East Tower, Ballroom Level
Crothers, Jody	Coding	Saturday	11:30 a.m. – 12:30 p.m.	Dusable, West Tower, Third Floor
Cucci, Audrey	STEM/Connecting Science and Math	Saturday	10:15 – 11:15 a.m.	Water Tower, West Tower, Concourse Level
Cuellar Rodriguez, Cynthia	Elementary Math	Saturday	3:30 – 5 p.m.	Horner, West Tower, Third Floor
Cummings, Lorelei	Coding and STEM	Friday	2 – 3 p.m.	Picasso, West Tower, Concourse Level
Cummings, Lorelei	General Science	Saturday	10:15 – 11:15 a.m.	Haymarket, West Tower, Concourse Level
Curran, Kristy	Geometry	Friday	2 – 3 p.m.	San Francisco, West Tower, Ballroom Level
Dahan, Jean-Jacques	Calculus	Friday	2 – 3 p.m.	Wrigley, West Tower, Concourse Level
Damaske, Jane	Middle Grades Math	Friday	2 – 3 p.m.	Michigan 1A, East Tower, Concourse Level
Daniels, Hugh	General Math	Friday	10 – 11:30 a.m.	Columbus EF, East Tower, Ballroom Level
Davis, Ronda	Assessment	Friday	12:45 – 1:45 p.m.	Ogden, West Tower, Third Floor
Davis, Stephen		Sunday	8:30 – 10 a.m.	Columbus GH, East Tower, Ballroom Level
Day, Judy	General Science	Saturday	8:30 – 10 a.m.	Haymarket, West Tower, Concourse Level
de la Cruz, Juan	General Math	Friday	12:45 – 1:45 p.m.	Columbus EF, East Tower, Ballroom Level
Decovsky, Fred	Algebra II	Friday	12:45 – 1:45 p.m.	Michigan 2, East Tower, Concourse Level
Delia, Anna	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Columbian, West Tower, Concourse Level
Dick, Tom	Calculus	Saturday	8:30 – 5 p.m.	Regency Ballroom C, West Tower, Ballroom Level
Dick, Tom		Sunday	8:30 – 10 a.m.	Columbus GH, East Tower, Ballroom Level
Dicker, Deborah	General Interest	Friday	2 – 3 p.m.	Columbus IJ, East Tower, Ballroom Level
Dickerson, Thomas	Coding and STEM	Friday	2 – 3 p.m.	Gold Coast, West Tower, Concourse Level

D

Presenter Index

Name	Subject	Day	Time	Location
Dodd, Greg	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Water Tower, West Tower, Concourse Level
Dorsey, Michael	General Interest	Saturday	3:30 – 5 p.m.	Michigan 3, East Tower, Concourse Level
Drago, Mark	Algebra I	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 1B, East Tower, Concourse Level
Durbin, Nathan	Precalculus	Friday	3:15 – 4:15 p.m.	Wright, West Tower, Third Floor
E Edwards, Sheryl	Coding	Friday	2 – 3 p.m.	Hong Kong, West Tower, Ballroom Level
Ellis, Wade	Middle Grades Math	Friday	12:45 – 1:45 p.m.	San Francisco, West Tower, Ballroom Level
England, Katie	Middle Grades Math	Saturday	10:15 – 11:15 a.m.	Columbus IJ, East Tower, Ballroom Level
Esquibel, Jessica	Algebra I	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 1C, East Tower, Concourse Level
Everding, Sherry	General Interest	Saturday	8:30 – 10 a.m.	Michigan 2, East Tower, Concourse Level
Ewry, Daryl	General Interest	Saturday	3:30 – 5 p.m.	Field, West Tower, Third Floor
F Fagan, Patsy	CAS	Friday	2 – 3 p.m.	Addams, West Tower, Third Floor
Farrell, Anthony	CAS	Friday	12:45 – 1:45 p.m.	Addams, West Tower, Third Floor
Ferneyhough, Fred	CAS	Friday	3:15 – 4:15 p.m.	Addams, West Tower, Third Floor
Fisher, Alice	Precalculus	Saturday	11:30 a.m. – 12:30 p.m.	Wright, West Tower, Third Floor
Flynn, Peter	CAS	Saturday	1:45 – 3:15 p.m.	McCormick, West Tower, Third Floor
Foerster, Paul	Precalculus	Saturday	8:30 – 10 a.m.	Columbus G, East Tower, Ballroom Level
Foley, Gregory	General Math	Friday	10 – 11:30 a.m.	Columbus CD, East Tower, Ballroom Level
Forck, Jana	Calculus	Saturday	1:45 – 3:15 p.m.	Atlanta, West Tower, Ballroom Level
Fotsch, Fred	Coding and STEM	Saturday	8:30 – 10 a.m.	Gold Coast, West Tower, Concourse Level
Fotsch, Fred	Coding and STEM	Saturday	10:15 – 11:15 a.m.	Gold Coast, West Tower, Concourse Level
Fox, Peter	Coding and STEM	Friday	3:15 – 4:15 p.m.	Picasso, West Tower, Concourse Level
Fox, Ray	Coding	Saturday	11:30 a.m. – 12:30 p.m.	Hong Kong, West Tower, Ballroom Level
Fox, Tom	CAS	Saturday	11:30 a.m. – 12:30 p.m.	Addams, West Tower, Third Floor

Presenter Index

G

Name	Subject	Day	Time	Location
Galloway, Ian	Physics	Saturday	11:30 a.m. – 12:30 p.m.	Haymarket, West Tower, Concourse Level
Galson, Scott	CAS	Friday	10 – 11:30 a.m.	Addams, West Tower, Third Floor
Gandy, Yuridia	Coding and STEM	Saturday	3:30 – 5 p.m.	Gold Coast, West Tower, Concourse Level
Gapinski, Robin	General Interest	Friday	2 – 3 p.m.	Columbus IJ, East Tower, Ballroom Level
Garneau, Marc	Coding and STEM	Friday	10 – 11:30 a.m.	Gold Coast, West Tower, Concourse Level
Garneau, Marc	Coding and STEM	Friday	12:45 – 1:45 p.m.	Gold Coast, West Tower, Concourse Level
Garneau, Marc	Coding and STEM	Saturday	11:30 a.m. – 12:30 p.m.	Picasso, West Tower, Concourse Level
Garneau, Marc	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Gasque, Betty	STEM/Connecting Science and Math	Friday	12:45 – 1:45 p.m.	Water Tower, West Tower, Concourse Level
Godbold, Landy	Algebra II	Friday	12:45 – 1:45 p.m.	Michigan 3, East Tower, Concourse Level
Godbold, Landy		Sunday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
Goetz, Michelle	Precalculus	Saturday	8:30 – 10 a.m.	Toronto, West Tower, Ballroom Level
Gold, Lindsay	Elementary Math	Friday	2 – 3 p.m.	Horner, West Tower, Third Floor
Gold, Lindsay	Coding	Friday	3:15 – 4:15 p.m.	Hong Kong, West Tower, Ballroom Level
Gonzalez, Juan Manuel	Statistics	Saturday	10:15 – 11:15 a.m.	Atlanta, West Tower, Ballroom Level
Gorsuch, Rachael	STEM/Connecting Science and Math	Friday	10 – 11:30 a.m.	Columbian, West Tower, Concourse Level
Gorsuch, Rachael	Statistics	Saturday	11:30 a.m. – 12:30 p.m.	Horner, West Tower, Third Floor
Gough, Jill	Middle Grades Math	Friday	10 – 11:30 a.m.	Dusable, West Tower, Third Floor
Gough, Jill	Formative Assessment	Saturday	8:30 – 10 a.m.	Columbus H, East Tower, Ballroom Level
Gough, Jill		Sunday	8:30 – 10 a.m.	Columbus AB, East Tower, Ballroom Level
Gough, Sam	Algebra II	Saturday	10:15 – 11:15 a.m.	Michigan 3, East Tower, Concourse Level
Graba, Todd	Coding and STEM	Saturday	10:15 – 11:15 a.m.	Picasso, West Tower, Concourse Level
Grell, Brandon	Geometry	Saturday	3:30 – 5 p.m.	Toronto, West Tower, Ballroom Level
Guntharp, Marsha	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Acapulco, West Tower, Ballroom Level
Gutierrez, Claudia	Administrator	Saturday	10:15 – 11:15 a.m.	McCormick, West Tower, Third Floor
Gómez Niño, Julián Ricardo	CAS	Friday	3:15 – 4:15 p.m.	Dusable, West Tower, Third Floor
Gómez Niño, Julián Ricardo	General Math	Saturday	11:30 a.m. – 12:30 p.m.	Field, West Tower, Third Floor

Presenter Index

Name	Subject	Day	Time	Location
H Haas, Karlheinz	STEM/Connecting Science and Math	Friday	3:15 – 4:15 p.m.	Water Tower, West Tower, Concourse Level
Hale, Kathy	Assessment	Saturday	3:30 – 5 p.m.	Ogden, West Tower, Third Floor
Hanna, John	Coding and STEM	Friday	10 – 11:30 a.m.	Gold Coast, West Tower, Concourse Level
Hanna, John	Coding and STEM	Friday	12:45 – 1:45 p.m.	Gold Coast, West Tower, Concourse Level
Harris, Donna	Middle Grades Math	Friday	3:15 – 4:15 p.m.	Michigan 1A, East Tower, Concourse Level
Harris, Pamela	General Math	Saturday	8:30 – 10 a.m.	Columbus EF, East Tower, Ballroom Level
Herbrechtsmeier, Erik	Statistics	Friday	3:15 – 4:15 p.m.	Atlanta, West Tower, Ballroom Level
Hess, I.H.M., Sister Alice	Algebra II	Friday	10 – 11:30 a.m.	Michigan 3, East Tower, Concourse Level
Heugl, Helmut	CAS	Friday	12:45 – 1:45 p.m.	McCormick, West Tower, Third Floor
Hicks, Judy	Middle Grades Math	Friday	2 – 3 p.m.	Michigan 1A, East Tower, Concourse Level
High, Jennifer	Middle Grades Math	Friday	2 – 3 p.m.	New Orleans, West Tower, Ballroom Level
High, Jennifer	General Math	Friday	3:15 – 4:15 p.m.	Columbus EF, East Tower, Ballroom Level
Highman, Della	Formative Assessment	Friday	3:15 – 4:15 p.m.	Field, West Tower, Third Floor
Hocutt, Sandra	Algebra I	Saturday	3:30 – 5 p.m.	Hong Kong, West Tower, Ballroom Level
Houston, Mike	Elementary Math	Friday	2 – 3 p.m.	Horner, West Tower, Third Floor
Hudson, Valerie	Formative Assessment	Saturday	10:15 – 11:15 a.m.	Field, West Tower, Third Floor
Hudson, Valerie	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Hughes Hallett, Deborah		Sunday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
Hus, James	Precalculus	Saturday	3:30 – 5 p.m.	Wright, West Tower, Third Floor
I lacuone, Leann	General Science	Friday	12:45 – 1:45 p.m.	Haymarket, West Tower, Concourse Level
Ilaria, Daniel	Middle Grades Math	Friday	12:45 – 1:45 p.m.	Acapulco, West Tower, Ballroom Level
Ilaria, Daniel	Algebra I	Saturday	1:45 – 3:15 p.m.	Michigan 2, East Tower, Concourse Level
Ingram, Jaryn	General Interest	Saturday	3:30 – 5 p.m.	Field, West Tower, Third Floor
Isaacs, John	Coding	Saturday	8:30 – 10 a.m.	Dusable, West Tower, Third Floor
J Jensen, Alexis	Precalculus	Saturday	1:45 – 3:15 p.m.	Addams, West Tower, Third Floor
Johnson, Nancy	General Math	Saturday	10:15 – 11:15 a.m.	Ogden, West Tower, Third Floor

Presenter Index

Name	Subject	Day	Time	Location
Jones, Tammy	Elementary Math	Friday	10 – 11:30 a.m.	Horner, West Tower, Third Floor
Jones, Tammy	Elementary Math	Saturday	8:30 – 10 a.m.	Acapulco, West Tower, Ballroom Level
Jones, Tammy	Middle Grades Math	Saturday	1:45 – 3:15 p.m.	Acapulco, West Tower, Ballroom Level
Kachur, Jessica	Statistics	Friday	3:15 – 4:15 p.m.	Atlanta, West Tower, Ballroom Level
Kanold, Tim	General Interest	Friday	10 – 11:30 a.m.	Columbus KL, East Tower, Ballroom Level
Kanold, Tim	General Interest	Friday	12:45 – 1:45 p.m.	Columbus KL, East Tower, Ballroom Level
Kasitz, Christine	General Interest	Friday	3:15 – 4:15 p.m.	Columbus H, East Tower, Ballroom Level
Kelly, Jennifer	General Math	Friday	2 – 3 p.m.	Columbus CD, East Tower, Ballroom Level
Keltner, Scott	Algebra II	Friday	3:15 – 4:15 p.m.	Columbus IJ, East Tower, Ballroom Level
Kennedy, Dan	STEM/Connecting Science and Math	Saturday	3:30 – 5 p.m.	Water Tower, West Tower, Concourse Level
Kidwell, Antoinette	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 3, East Tower, Concourse Level
Kinney, Amanda	Middle Grades Math	Saturday	3:30 – 5 p.m.	Michigan 1A, East Tower, Concourse Level
Klar, Jennifer	Middle Grades Math	Saturday	3:30 – 5 p.m.	Michigan 1A, East Tower, Concourse Level
Klein, Ray	Algebra II	Friday	10 – 11:30 a.m.	Michigan 3, East Tower, Concourse Level
Klein, Ray	Geometry	Saturday	1:45 – 3:15 p.m.	Columbus CD, East Tower, Ballroom Level
Knapp, Scott	Trigonometry	Saturday	10:15 – 11:15 a.m.	Wright, West Tower, Third Floor
Koehler, Mike	Statistics	Saturday	11:30 a.m. – 12:30 p.m.	Atlanta, West Tower, Ballroom Level
Kohout, Jessica	General Science	Friday	12:45 – 1:45 p.m.	Haymarket, West Tower, Concourse Level
Kokason, Naomi	Geometry	Saturday	11:30 a.m. – 12:30 p.m.	New Orleans, West Tower, Ballroom Level
Kucera, Lee	Algebra I	Friday	2 – 3 p.m.	Michigan 3, East Tower, Concourse Level
Kujawa, Bill	Trigonometry	Friday	10 – 11:30 a.m.	Wright, West Tower, Third Floor
Lalani, Amin	Coding	Friday	10 – 11:30 a.m.	Hong Kong, West Tower, Ballroom Level
LaMaster, John	Precalculus	Saturday	8:30 – 10 a.m.	Wright, West Tower, Third Floor
Lancaster, Ron	Algebra II	Friday	10 – 11:30 a.m.	Michigan 2, East Tower, Concourse Level
Lannen, Brian	Geometry	Saturday	10:15 – 11:15 a.m.	San Francisco, West Tower, Ballroom Level
Lapp, Douglas	CAS	Saturday	8:30 – 10 a.m.	Addams, West Tower, Third Floor

Presenter Index

Name	Subject	Day	Time	Location
Larson, Matt	General Interest	Friday	10 – 11:30 a.m.	Columbus KL, East Tower, Ballroom Level
Larson, Matt	General Interest	Saturday	10:15 – 11:15 a.m.	Columbus G, East Tower, Ballroom Level
Latham, Karen	Algebra I	Friday	2 – 3 p.m.	Toronto, West Tower, Ballroom Level
Leaman, Kara	STEM/Connecting Science and Math	Saturday	1:45 – 3:15 p.m.	Columbian, West Tower, Concourse Level
Lepeska, Jon	Geometry	Saturday	10:15 – 11:15 a.m.	Toronto, West Tower, Ballroom Level
Lesniewski, Ray	Chemistry	Saturday	1:45 – 3:15 p.m.	Haymarket, West Tower, Concourse Level
Levine-Wissing, Robin	Algebra I	Friday	2 – 3 p.m.	Michigan 3, East Tower, Concourse Level
Littleton, Pam	Algebra I	Saturday	8:30 – 10 a.m.	Michigan 1C, East Tower, Concourse Level
Long, Michael	Calculus	Friday	3:15 – 4:15 p.m.	Wrigley, West Tower, Concourse Level
Longueria, Chris	General Math	Friday	3:15 – 4:15 p.m.	Columbus CD, East Tower, Ballroom Level
Lowe, Jim	General Interest	Friday	12:45 – 1:45 p.m.	Columbus H, East Tower, Ballroom Level
Lozano Diaz, Cesar	STEM/Connecting Science and Math	Saturday	10:15 – 11:15 a.m.	Columbian, West Tower, Concourse Level
Lukens, Jeff	STEM/Connecting Science and Math	Friday	12:45 – 1:45 p.m.	Water Tower, West Tower, Concourse Level
Lukens, Jeff	General Science	Friday	2 – 3 p.m.	Haymarket, West Tower, Concourse Level
Lutz, Kevin	Statistics	Saturday	3:30 – 5 p.m.	Wrigley, West Tower, Concourse Level
Lutz, Mike	Algebra I	Saturday	3:30 – 5 p.m.	Michigan 2, East Tower, Concourse Level
Lyublinskaya, Irina	Elementary Math	Saturday	8:30 – 10 a.m.	Horner, West Tower, Third Floor
Lyublinskaya, Irina	Coding and STEM	Saturday	3:30 – 5 p.m.	Picasso, West Tower, Concourse Level
Mabbott, Art	Precalculus	Friday	10 – 11:30 a.m.	Acapulco, West Tower, Ballroom Level
Mankus, Margo Lynn	Coding and STEM	Friday	10 – 11:30 a.m.	Picasso, West Tower, Concourse Level
Mankus, Margo Lynn	General Interest	Saturday	3:30 – 5 p.m.	Columbus IJ, East Tower, Ballroom Level
Mankus, Terrance	Coding and STEM	Friday	10 – 11:30 a.m.	Picasso, West Tower, Concourse Level
Mann, Kristy	Coding	Saturday	8:30 – 10 a.m.	Hong Kong, West Tower, Ballroom Level
Mara, Patrick	Calculus	Friday	12:45 – 1:45 p.m.	Wrigley, West Tower, Concourse Level
Martinez, Katie	Algebra I	Saturday	1:45 – 3:15 p.m.	Michigan 2, East Tower, Concourse Level

M

Presenter Index

Name	Subject	Day	Time	Location
Martinez, Marco	Algebra II	Friday	3:15 – 4:15 p.m.	Michigan 3, East Tower, Concourse Level
Mason, Melanie	General Math	Saturday	3:30 – 5 p.m.	Columbus EF, East Tower, Ballroom Level
McCalla, Jeff	General Math	Saturday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
McCalla, Jeff	Algebra II	Saturday	10:15 – 11:15 a.m.	Dusable, West Tower, Third Floor
McCalla, Jeff	Statistics	Saturday	3:30 – 5 p.m.	Atlanta, West Tower, Ballroom Level
McCord, Kyle	Geometry	Saturday	11:30 a.m. – 12:30 p.m.	Toronto, West Tower, Ballroom Level
McKenny, Jean	Geometry	Friday	10 – 11:30 a.m.	San Francisco, West Tower, Ballroom Level
McKinley, Kathleen	Middle Grades Math	Saturday	8:30 – 10 a.m.	Michigan 1A, East Tower, Concourse Level
McKinney, Kris	Administrator	Saturday	10:15 – 11:15 a.m.	McCormick, West Tower, Third Floor
McMahon, Nancy	Algebra I	Friday	12:45 – 1:45 p.m.	Michigan 1B, East Tower, Concourse Level
Melnyk, Angela	Middle Grades Math	Saturday	1:45 – 3:15 p.m.	Michigan 1A, East Tower, Concourse Level
Merriweather, Michelle	Precalculus	Friday	3:15 – 4:15 p.m.	Toronto, West Tower, Ballroom Level
Meston, Sanjeev	STEM/Connecting Science and Math	Saturday	3:30 – 5 p.m.	Dusable, West Tower, Third Floor
Mezera, Tracie	Precalculus	Saturday	3:30 – 5 p.m.	Wright, West Tower, Third Floor
Mika, Andrea	General Interest	Saturday	3:30 – 5 p.m.	Columbus H, East Tower, Ballroom Level
Miltenberg, JoAnn	Coding and STEM	Saturday	1:45 – 3:15 p.m.	Gold Coast, West Tower, Concourse Level
Mitchell, Christopher	Coding and STEM	Friday	2 – 3 p.m.	Gold Coast, West Tower, Concourse Level
Mitchener, Jan	General Interest	Saturday	8:30 – 10 a.m.	Columbus KL, East Tower, Ballroom Level
Mize, Josh	Algebra II	Friday	2 – 3 p.m.	Michigan 2, East Tower, Concourse Level
Moleres, Mary	CAS	Friday	2 – 3 p.m.	Addams, West Tower, Third Floor
Montero Gaona, Manuel Antonio	General Math	Saturday	11:30 a.m. – 12:30 p.m.	Field, West Tower, Third Floor
Moody, Chris	Geometry	Saturday	11:30 a.m. – 12:30 p.m.	Toronto, West Tower, Ballroom Level
Morstein, Todd	Coding and STEM	Saturday	8:30 – 10 a.m.	Picasso, West Tower, Concourse Level
Morstein, Todd	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Moskowitz, Stuart	Precalculus	Saturday	8:30 – 10 a.m.	Wright, West Tower, Third Floor

Presenter Index

	Name	Subject	Day	Time	Location
N	Nakamoto, Jim	General Interest	Friday	2 – 3 p.m.	Columbus H, East Tower, Ballroom Level
	Norrell, Toni	Coding and STEM	Saturday	11:30 a.m. – 12:30 p.m.	Gold Coast, West Tower, Concourse Level
	Nutt, Deb	General Interest	Friday	3:15 – 4:15 p.m.	Horner, West Tower, Third Floor
O	Ocampo, Veronica	Middle Grades Math	Saturday	10:15 – 11:15 a.m.	Michigan 1A, East Tower, Concourse Level
	Ogden, Stephanie	Calculus	Friday	12:45 – 1:45 p.m.	Toronto, West Tower, Ballroom Level
	Ogden, Stephanie	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
	Oliver, Scott	General Interest	Saturday	3:30 – 5 p.m.	McCormick, West Tower, Third Floor
	Owen, Tim	Trigonometry	Friday	10 – 11:30 a.m.	Wright, West Tower, Third Floor
	Owens, Matthew	Algebra II	Saturday	10:15 – 11:15 a.m.	Dusable, West Tower, Third Floor
	Parlette, Amy	Geometry	Friday	2 – 3 p.m.	San Francisco, West Tower, Ballroom Level
P	Parr, Andi	General Math	Friday	10 – 11:30 a.m.	Water Tower, West Tower, Concourse Level
	Parr, Richard	Precalculus	Saturday	11:30 a.m. – 12:30 p.m.	Wright, West Tower, Third Floor
	Penn, Tamara	Calculus	Friday	2 – 3 p.m.	Acapulco, West Tower, Ballroom Level
	Pennell, Adam	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Dusable, West Tower, Third Floor
	Perry, Bryson	Coding	Friday	10 – 11:30 a.m.	Field, West Tower, Third Floor
	Phegley, Sherri	Formative Assessment	Saturday	1:45 – 3:15 p.m.	Field, West Tower, Third Floor
	Phelps, Steve	Calculus	Friday	10 – 11:30 a.m.	Wrigley, West Tower, Concourse Level
	Phelps, Steve	CAS	Saturday	11:30 a.m. – 12:30 p.m.	McCormick, West Tower, Third Floor
	Piekarski, Ellen	Precalculus	Saturday	1:45 – 3:15 p.m.	Addams, West Tower, Third Floor
	Plein, Tami	General Science	Saturday	3:30 – 5 p.m.	Haymarket, West Tower, Concourse Level
	Posnanski, Brad	Algebra II	Saturday	8:30 – 10 a.m.	Michigan 3, East Tower, Concourse Level
	Poss, Debbie	Precalculus	Friday	2 – 3 p.m.	Wright, West Tower, Third Floor
	Poulsen, Robyn	Coding and STEM	Friday	12:45 – 1:45 p.m.	Picasso, West Tower, Concourse Level
	Poulsen, Robyn	General Math	Friday	2 – 3 p.m.	Field, West Tower, Third Floor
	Prince, Marian	Middle Grades Math	Saturday	8:30 – 10 a.m.	Michigan 1B, East Tower, Concourse Level
	Principato, Angela	STEM/Connecting Science and Math	Saturday	11:30 a.m. – 12:30 p.m.	Columbian, West Tower, Concourse Level

Presenter Index

R

Name	Subject	Day	Time	Location
Reardon, Tom	Geometry	Friday	12:45 – 1:45 p.m.	Columbus G, East Tower, Ballroom Level
Reardon, Tom	General Math	Friday	3:15 – 4:15 p.m.	Columbus KL, East Tower, Ballroom Level
Reardon, Tom	General Math	Saturday	1:45 – 3:15 p.m.	Columbus EF, East Tower, Ballroom Level
Record, Anthony	CAS	Saturday	10:15 – 11:15 a.m.	Addams, West Tower, Third Floor
Reeves, David	Statistics	Friday	10 – 11:30 a.m.	Atlanta, West Tower, Ballroom Level
Riggins, Julie	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Dusable, West Tower, Third Floor
Riggins, Julie	Algebra I	Saturday	10:15 – 11:15 a.m.	Michigan 1C, East Tower, Concourse Level
Riker, Susan	General Interest	Friday	12:45 – 1:45 p.m.	Dusable, West Tower, Third Floor
Rinehart, Michelle	Middle Grades Math	Friday	12:45 – 1:45 p.m.	Acapulco, West Tower, Ballroom Level
Rinehart, Michelle	Coding and STEM	Saturday	11:30 a.m. – 12:30 p.m.	Gold Coast, West Tower, Concourse Level
Rinehart, Michelle	General Interest	Saturday	3:30 – 5 p.m.	Columbus KL, East Tower, Ballroom Level
Roberts, Doug	General Math	Saturday	10:15 – 11:15 a.m.	Columbus EF, East Tower, Ballroom Level
Roberts, Ed	General Math	Saturday	10:15 – 11:15 a.m.	Columbus EF, East Tower, Ballroom Level
Robinson, Delbra	General Interest	Saturday	8:30 – 10 a.m.	Columbus IJ, East Tower, Ballroom Level
Rockstroh, Molly	Precalculus	Saturday	1:45 – 3:15 p.m.	Wright, West Tower, Third Floor
Roebuck, Valerie	Middle Grades Math	Friday	2 – 3 p.m.	New Orleans, West Tower, Ballroom Level
Roessler, Rachal	Chemistry	Friday	3:15 – 4:15 p.m.	Haymarket, West Tower, Concourse Level
Ruda, Chris	Elementary Math	Friday	12:45 – 1:45 p.m.	Horner, West Tower, Third Floor
Ruda, Chris	Elementary Math	Saturday	1:45 – 3:15 p.m.	Horner, West Tower, Third Floor
Ruda, Chris	Elementary Math	Saturday	3:30 – 5 p.m.	Acapulco, West Tower, Ballroom Level
Rudolph, Heidi	Algebra II	Saturday	10:15 – 11:15 a.m.	Michigan 2, East Tower, Concourse Level
Sanchez, Abigail	General Math	Saturday	11:30 a.m. – 12:30 p.m.	Columbus EF, East Tower, Ballroom Level
Sanchez, Martin	Middle Grades Math	Saturday	1:45 – 3:15 p.m.	Michigan 1A, East Tower, Concourse Level
Sanchez, Patrick	General Math	Saturday	11:30 a.m. – 12:30 p.m.	Columbus EF, East Tower, Ballroom Level
Santana, Miriam	Algebra I	Friday	2 – 3 p.m.	Michigan 1C, East Tower, Concourse Level
Scherer, Jerry	General Interest	Friday	10 – 11:30 a.m.	Toronto, West Tower, Ballroom Level

S

Presenter Index

Name	Subject	Day	Time	Location
Schiffman, Jay	CAS	Saturday	8:30 – 10 a.m.	McCormick, West Tower, Third Floor
Schjelderup, Kim	General Interest	Friday	10 – 11:30 a.m.	Columbus H, East Tower, Ballroom Level
Schlemper, Ann	Precalculus	Saturday	8:30 – 10 a.m.	Toronto, West Tower, Ballroom Level
Schlemper, Ann	STEM/Connecting Science and Math	Saturday	1:45 – 3:15 p.m.	Columbian, West Tower, Concourse Level
Schrock, Connie	General Interest	Saturday	1:45 – 3:15 p.m.	Columbus G, East Tower, Ballroom Level
Sergi, Ashley	Statistics	Saturday	11:30 a.m. – 12:30 p.m.	Horner, West Tower, Third Floor
Sever, Eric	Statistics	Saturday	1:45 – 3:15 p.m.	Ogden, West Tower, Third Floor
Sheridan, Debbie	General Math	Friday	3:15 – 4:15 p.m.	Columbus EF, East Tower, Ballroom Level
Shirazi, Pareesa	Assessment	Friday	12:45 – 1:45 p.m.	Ogden, West Tower, Third Floor
Slater, Don	Precalculus	Friday	2 – 3 p.m.	Wright, West Tower, Third Floor
Smeltzer, Penny		Sunday	8:30 – 10 a.m.	Columbus CD, East Tower, Ballroom Level
Smilowitz, Rachael	Middle Grades Math	Saturday	3:30 – 5 p.m.	Michigan 1B, East Tower, Concourse Level
Smith, Adam	General Interest	Friday	12:45 – 1:45 p.m.	New Orleans, West Tower, Ballroom Level
Smith, Beth	General Interest	Friday	12:45 – 1:45 p.m.	Columbus IJ, East Tower, Ballroom Level
Smith, Beth	General Interest	Saturday	11:30 a.m. – 12:30 p.m.	Columbus KL, East Tower, Ballroom Level
Smith, Caroline	STEM/Connecting Science and Math	Friday	12:45 – 1:45 p.m.	Columbian, West Tower, Concourse Level
Smith, Charles	Physics	Saturday	1:45 – 3:15 p.m.	Wrigley, West Tower, Concourse Level
Smith, Michael	Physics	Saturday	1:45 – 3:15 p.m.	Wrigley, West Tower, Concourse Level
Smith, Patti	General Science	Saturday	8:30 – 10 a.m.	Haymarket, West Tower, Concourse Level
Smith, Richard	Formative Assessment	Saturday	11:30 a.m. – 12:30 p.m.	Ogden, West Tower, Third Floor
Solomon, Deobra	Statistics	Saturday	10:15 – 11:15 a.m.	Acapulco, West Tower, Ballroom Level
Soto, Tori	Formative Assessment	Saturday	1:45 – 3:15 p.m.	Field, West Tower, Third Floor
Srygley, Corina	General Math	Saturday	10:15 – 11:15 a.m.	Columbus CD, East Tower, Ballroom Level
St. John, Denny	Authoring	Friday	12:45 – 1:45 p.m.	Hong Kong, West Tower, Ballroom Level
Staley, John	STEM/Connecting Science and Math	Friday	2 – 3 p.m.	Columbus G, East Tower, Ballroom Level

Presenter Index

Name	Subject	Day	Time	Location
Stayton, Sheri	CAS	Saturday	3:30 – 5 p.m.	Addams, West Tower, Third Floor
Steeves, David	Middle Grades Math	Saturday	8:30 – 10 a.m.	Wrigley, West Tower, Concourse Level
Steinke, Tom	Formative Assessment	Friday	10 – 11:30 a.m.	Ogden, West Tower, Third Floor
Stern, Howard	Algebra I	Friday	3:15 – 4:15 p.m.	Michigan 1B, East Tower, Concourse Level
Stetsko, Margaret	Geometry	Saturday	10:15 – 11:15 a.m.	Toronto, West Tower, Ballroom Level
Straight, Levi	Statistics	Saturday	10:15 – 11:15 a.m.	Wrigley, West Tower, Concourse Level
Suarez, Lisa	Coding	Friday	2 – 3 p.m.	Hong Kong, West Tower, Ballroom Level
Sword, David	General Interest	Saturday	8:30 – 10 a.m.	Columbus IJ, East Tower, Ballroom Level
T Taylor, Ariel	Assessment	Saturday	8:30 – 10 a.m.	Ogden, West Tower, Third Floor
Terrill, Holly	Algebra I	Friday	3:15 – 4:15 p.m.	Michigan 1C, East Tower, Concourse Level
Thibodeaux, Stacy	STEM/Connecting Science and Math	Friday	10 – 11:30 a.m.	Columbian, West Tower, Concourse Level
Thibodeaux, Stacy	Coding and STEM	Friday	3:15 – 4:15 p.m.	Gold Coast, West Tower, Concourse Level
Thomas, Kimberley	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Michigan 2, East Tower, Concourse Level
Toomey, Sarada	General Math	Saturday	10:15 – 11:15 a.m.	Columbus H, East Tower, Ballroom Level
Traylor, Kathy	Middle Grades Math	Saturday	3:30 – 5 p.m.	Michigan 1B, East Tower, Concourse Level
Tucker, Suzanne	STEM/Connecting Science and Math	Friday	3:15 – 4:15 p.m.	Columbian, West Tower, Concourse Level
U Underwood, Becky	Coding	Saturday	8:30 – 10 a.m.	Field, West Tower, Third Floor
Usiskin, Zalman	Geometry	Saturday	1:45 – 3:15 p.m.	Columbus CD, East Tower, Ballroom Level
V Van Dyken, Kymn	Middle Grades Math	Saturday	1:45 – 3:15 p.m.	Michigan 1B, East Tower, Concourse Level
Voydanoff, Paul	STEM/Connecting Science and Math	Saturday	11:30 a.m. – 12:30 p.m.	Columbian, West Tower, Concourse Level

Presenter Index

	Name	Subject	Day	Time	Location
W	Wadden, Allister	General Interest	Friday	10 – 11:30 a.m.	Columbus IJ, East Tower, Ballroom Level
	Ward, Barbara	Algebra I	Friday	2 – 3 p.m.	Michigan 1B, East Tower, Concourse Level
	Wares, Arsalan	Geometry	Friday	3:15 – 4:15 p.m.	New Orleans, West Tower, Ballroom Level
	Washburn, Scott	Algebra II	Saturday	11:30 a.m. – 12:30 p.m.	Wrigley, West Tower, Concourse Level
	Watson, Tracy	Statistics	Saturday	8:30 – 10 a.m.	Atlanta, West Tower, Ballroom Level
	West, Stephen	Geometry	Saturday	10:15 – 11:15 a.m.	New Orleans, West Tower, Ballroom Level
	Wheeler, Judy	Middle Grades Math	Saturday	8:30 – 10 a.m.	Michigan 1B, East Tower, Concourse Level
	Whitecotton, Cassie	Coding and STEM	Saturday	1:45 – 3:15 p.m.	Picasso, West Tower, Concourse Level
	Whitecotton, Cassie	STEM/Connecting Science and Math	Saturday	3:30 – 5 p.m.	Water Tower, West Tower, Concourse Level
	Wilder, Melinda	General Math	Saturday	11:30 a.m. – 12:30 p.m.	Columbus CD, East Tower, Ballroom Level
	Wilkie, Daniel	STEM/Connecting Science and Math	Friday	10 – 11:30 a.m.	Columbian, West Tower, Concourse Level
	Willcoxon, Jason	Geometry	Saturday	3:30 – 5 p.m.	New Orleans, West Tower, Ballroom Level
	Williams, Gregory	STEM/Connecting Science and Math	Saturday	1:45 – 3:15 p.m.	Water Tower, West Tower, Concourse Level
	Willis, David	Coding and STEM	Friday	2 – 3 p.m.	Picasso, West Tower, Concourse Level
	Wilson, Dennis	Calculus	Friday	3:15 – 4:15 p.m.	San Francisco, West Tower, Ballroom Level
	Wilson, Jennifer	Middle Grades Math	Friday	10 – 11:30 a.m.	Dusable, West Tower, Third Floor
Wilson, Jennifer	Formative Assessment	Saturday	8:30 – 10 a.m.	Columbus H, East Tower, Ballroom Level	
Wilson, Jennifer		Sunday	8:30 – 10 a.m.	Columbus AB, East Tower, Ballroom Level	
Wingert, Tracy	Algebra I	Saturday	3:30 – 5 p.m.	Columbus CD, East Tower, Ballroom Level	
Wolf, Bernice	General Math	Saturday	3:30 – 5 p.m.	Columbus EF, East Tower, Ballroom Level	
Worcester, Don	Statistics	Friday	12:45 – 1:45 p.m.	Atlanta, West Tower, Ballroom Level	
Wright, Craig		Sunday	8:30 – 10 a.m.	Columbus GH, East Tower, Ballroom Level	
Y Z	Young, David	Coding and STEM	Saturday	3:30 – 5 p.m.	Gold Coast, West Tower, Concourse Level
	Zeydel, Kim	Geometry	Saturday	1:45 – 3:15 p.m.	New Orleans, West Tower, Ballroom Level

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