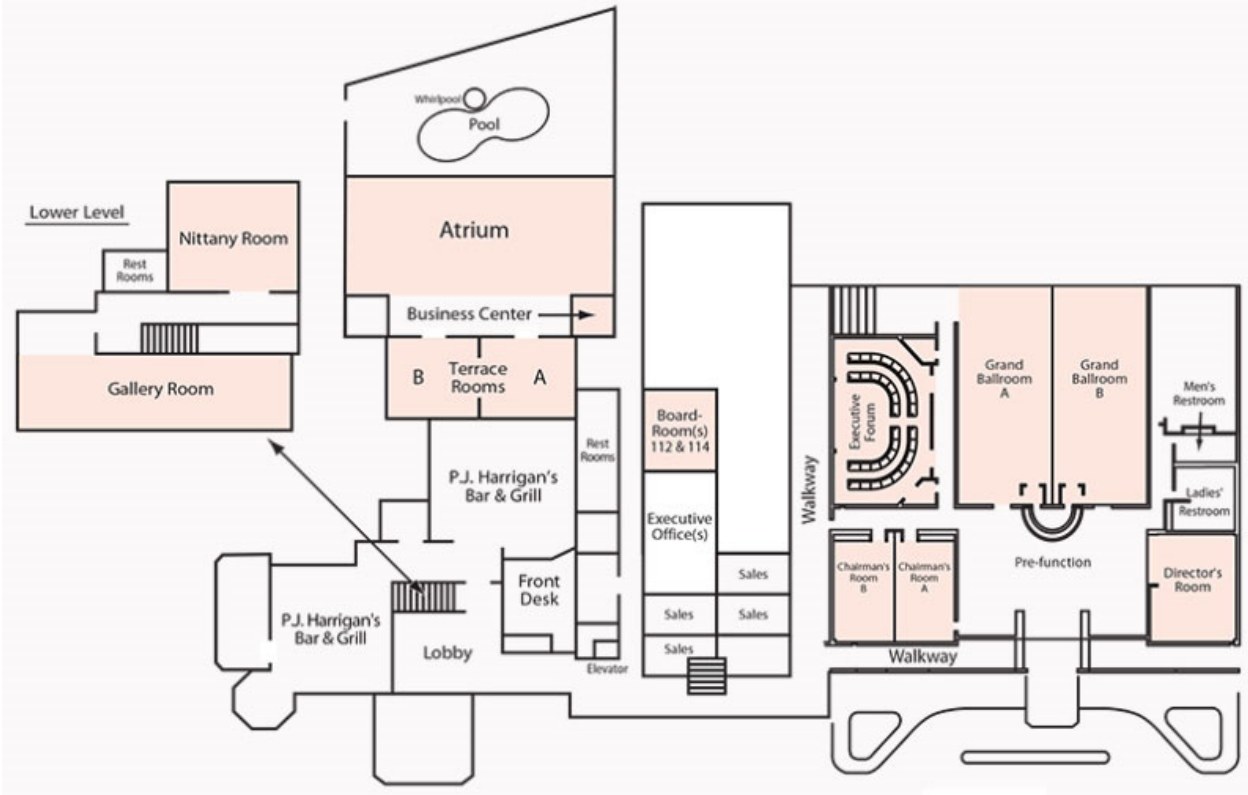


'23 | PRIME TIME FOR  
**TEAMWORK**

**PCTM Annual Conference**  
**July 26<sup>th</sup> – 28<sup>th</sup>**  
**State College**



# Ramada Inn Map



## Schedule Overview

### Wednesday

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5:00 - 6:00 PM	Cash Bar
6:00 PM	Dinner
6:30 - 7:30 PM	Keynote - Dr. Raj Shah

### Thursday

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8:00 - 9:00 AM IGNITE/PCTM Awards (Grand Ballroom A&B)

9:15 - 10:15 AM Breakout Sessions

- Convince Me That - Dan Kaufmann - All Grades (Grand Ballroom A)
- Math in Motion - Dana F. Morse, Texas Instruments - 10-12 (Grand Ballroom B)
- Hands-on Authentic Assessments in the Secondary Classroom - Pete Wisniewski - 10-12 (Nittany Room)
- Planning and Reacting: How Do I Best Respond to Student Thinking? - Edward C. Nolan - 10-12 (Gallery Room)
- Using Noticing and Wondering to Support Student Thinking - Amanda Reinsburrow - 4-9 (Terrace Rooms)
- Creating Equitable Systems for the Struggling Student - Jonathan Regino - K-3 (Director's Room)
- Standards Aligned System - Kevin Mauro, PDE - All Grades (Executive Forum)

10:30 - 11:30 AM Keynote - Dr. Shelly Jones

11:30 - 12:45PM Enjoy lunch and visit the vendor tables!

The buffet will be set up in Chairman's Rooms A&B. Enjoy your lunch in the Grand Ballrooms.

12:45 - 1:45 PM Breakout Sessions

- Technology that thinks with you, not for you - Eli Luberoff - All Grades (Grand Ballroom A)
- Activities that get the ENTIRE Class Involved – Kelly Brent – 7-12 (Grade Ballroom B)
- Give Your Math Curriculum a Boost with First In Math® - Jennifer Kling, Robert Sun, First In Math - K-9 (Nittany Room)
- DIY: Setting up a Middle School Math Intervention Program - Donna Wynkoop - 7-9 (Gallery Room)
- Reimagining Fluency through Powerful Routines - Jessie Oestreich, EdGems Math - 7-12 (Terrace Rooms)
- Developing Preservice Teachers' Experiences and Self-Efficacy in Mathematical Modeling Practices - Reuben S. Asempapa, Ph.D. - 4-9 (Director's Room)
- None of this is "new" math: Tracing meaning vs. memorization throughout US history - Emily Mainzer - K-6 (Executive Forum)

2:00 - 3:00 PM          Breakout Sessions

- Celebrating Student Brilliance in the Math Classroom - Tom Gantt, Amplify/Desmos Math - All Grades (Grand Ballroom A)
- PAEMST Process and a Math Discussion - Kevin Mauro, PDE - All Grades, (Grand Ballroom B)
- The Treatment of Function Transformations in GeoGebra Classroom Resources - Xiangquan Yao, Nicholas Grande - 7-12 (Nittany Room)
- Spatial Visualization Skills of Preservice Elementary Teachers - Debbie Gochenaur, Riana Peters - K-6 (Gallery Room)
- Why Every Mathematician Should be Vegan - Michael Tori - All Grades (Terrace Rooms)
- Cooperative Learning Techniques in the Classroom - Marian E Avery - All Grades (Director's Room)
- From Closed to Open: How to Turn Standardized Test Questions into Engaging Learning Experiences - Meredith Scheiner - All Grades (Executive Forum)

3:15 - 4:15 PM          Breakout Sessions

- Problem-Based Learning to Unlock Student Understanding - Tom Gantt, Amplify - 4-12 (Grand Ballroom A)
- TI Tips for Building Math Confidence for Keystone Exams - Dana F. Morse, Texas Instruments - 7-12 (Grand Ballroom B)
- How the Science of Reading Impacts Word Problems in Math - Jonathan Regino - K-3 (Nittany Room)
- Owing vs. Renting Knowledge: Using Writing in Mathematics and Guiding Your Students in Answering Open Ended Items on the Algebra I Keystone - Megan Clementi - 7-10 (Gallery Room)
- Using theatre, role play, acting and play writing to share the joy and beauty of mathematics - Joanne Ward - 4-9 (Terrace Rooms)
- MAGIC: Math Activities that Generate an Interesting Classroom - Jason Turka - 7-9 (Director's Room)
- You DO Have Time! Fitting Engaging Routines Into Your Lessons - Abby Gordon - All Grades (Executive Forum)

4:20 - 4:50 PM          PCTM Business Meeting (Grand Ballrooms A&B)

6:30 - 8:30 PM          Math Trivia Night! (P.J. Harrigan's Bar and Grille - located in the Ramada)



## A FRESH TAKE

# Explore STEMscopes Math Kindergarten-Algebra I

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Learn more at [STEMscopes.com/math](https://www.stemscopes.com/math)

Scan the QR code to fill out a quick form for a free preview, and you'll be entered to win a \$50 Amazon gift card!



## Friday

---

8:00 - 9:00 AM      Keynote - Howie Hua

9:15 - 10:15 AM      Breakout Sessions

- The Advanced Algebra/Finance Connection: A Perfect 3rd/4th Year Math Elective - Richard Sgroi - 10-12 (Grand Ballroom A)
- Encourage Investigation and Conversation with the Desmos Graphing Calculator - Bob Lochel - 7-12 (Grand Ballroom B)
- Problem Solving for All Students – Laurie Thompson, STEMscopes by Accelerate Learning - K-6 (Nittany Room)
- Pattern Breaking - Jay Schiffman - 7-12, All Grades (Gallery Room)
- Socratic seminars for agency, engagement, equity, access and improved math discourse - Joanne Ward - 4-12 (Terrace Rooms)
- Creating Collaborative Classrooms - Astrida Lizins - CPM Educational Program - 7-12 (Director's Room)
- Are Math Classrooms Neutral? - Exploring the Power Dynamics and Values of the Spaces - Gary Kaufman, Brandon Schadle - All Grades (Executive Forum)

10:30 - 11:30 AM Breakout Sessions

- Trix are for Kids...Not Math Class - Joelle Cooper - 3-12 (Grand Ballroom A)
- Influence, Impact & Improvement: The CDTs Empower Educators to Make a Difference - Dan Richards, Carrie Soliday - 4-12 (Grand Ballroom B)
- The Precious First Minutes of Math Class - Jeremy Cohen, Ph.D, Hand2Mind - K-8, (Nittany Room)
- Elevating Student Status with Rough Draft Talk - Jocelyn Dunnack, Astrida Lizins, CPM Educational Program - 7-12, All Grades (Gallery Room)
- Implementing Alternative Grading in Math Courses - Gabe Kramer, Kristen Pueschel - 10-12, All Grades (Terrace Rooms)
- When symbols crash like cymbals - Deana Deichert - 7-9 (Director's Room)
- CSATS Programs emphasize Math Practices for Secondary STEM Teachers - Kathy Hill – 7-12(Executive Forum)

11:30 - 12:45 PM Enjoy lunch and visit the vendor tables!

The buffet will be set up in Chairman's Rooms A&B. Enjoy your lunch in the Grand Ballrooms.

12:45 - 1:45 PM      Breakout Sessions

- Flexible Math Games to Build Fact Fluency - Daniel Kaufmann - K-6 (Grand Ballroom A)
- Statistical Thinking with CODAP - Leigh Nataro - 7-12 (Grand Ballroom B)
- Spot It - A Twist on Using Patters to Attain Addition and Subtraction Fact Fleuncy - Pat Peffley - K-3 (Nittany Room)
- Ratios, Rates, and Percents, Oh My! – Laurie Thompson, STEMscopes by Accelerate Learning - 4-9 (Gallery Room)

- The First 30 Minutes: Creating Access and Engagement - Emily Magee, Meredith Scheiner, Jessica Tilli and Lauren Hammond - All Grades (Terrace Rooms)
- Connecting Algebra Across Multiple Subjects - Christa Togans - 7-12 (Director's Room)
- Posing Engaging Problems to Inspire Mathematical Thinking - Jay L. Schiffman - 7-12, All Grades (Executive Forum)

2:00 - 3:00 PM            Breakout Sessions

- Free Open Middle Resources in GeoGebra to Enhance Mathematics Learning - Robert Pontecorvo - 7-12 (Grand Ballroom A)
- Vertical Alignment – Kelly Brent – All Grades (Grand Ballroom B)
- Owing vs. Renting Knowledge: Using Writing in Mathematics and Guiding Your Students in Answering Open Ended Items on the PSSA - Megan Clementi - 6-8 (Gallery Room)
- Activities for Tackling "Yucky" Math Topics - Bob Lochel - 7-12 (Terrace Rooms)
- Having Students Create Story Problems to Help Learn Adding and Subtracting Integers - David A. Wiest - 4-9 (Director's Room)
- Supporting Emerging Bilinguals in Math Class - Karise Mace, Enock Yeboah - 4-12 (Executive Forum)

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## Breakout Sessions

### Thursday - 9:15 – 10:15 AM

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#### **Convince Me That**

Dan Kaufmann

All Grades

During this session, participants will engage in the math routine Convince Me That. We will discuss how this routine can be implemented in the classroom to develop student justification skills and the same time build their math confidence.

**Grand Ballroom A**

#### **Math in Motion**

Dana F. Morse

Texas Instruments

10-12

Math isn't a spectator's sport. Let's get the students up and coding. In this session, we will learn to code to create a STEM culture in your classroom. Lots of free resources and activities to bring back to your school.

**Grand Ballroom B**

#### **Hands-on Authentic Assessments in the Secondary Classroom**

Pete Wisniewski

10-12

Looking to create rich performance tasks that apply student mathematical content knowledge? From bungee-jumping action figures to rocket launches and curve sketch contests, this session gives practical, hands-on examples of ways to assess student learning in novel and engaging ways.

**Nittany Room**

#### **Planning and Reacting: How Do I Best Respond to Student Thinking?**

Edward C. Nolan

10-12

Questioning aids student thinking, allowing students to do the sense making as supported by the teacher. Explore planning questions, anticipating responses, and developing actions to engage students in learning. Tools are provided to create environments where students do the sense making.

**Gallery Room**

## **Using Noticing and Wondering to Support Student Thinking**

Amanda Reinsburrow

4-9

Participants will engage in a problem-solving activity designed to simulate the student experience, followed by noticing and wondering about an authentic set of student work. These noticings and wonderings will be utilized to craft specific questions for each student, thus tying evidence to questions.

**Terrace Rooms**

## **Creating Equitable Systems for the Struggling Student**

Jonathan Regino

K-3

How can we create an environment in which all students are successful in grades K-2? We will look at systematic ways that we can improve learning in the math classrooms. We will focus on creating equitable practices in the math classroom for the teacher and the learner.

**Director's Room**

## **Standards Aligned System**

Kevin Mauro, PDE

All Grades

The Standards Aligned System (SAS), developed by the Pennsylvania Department of Education, is a comprehensive, researched-based resource to improve student achievement. SAS identifies six elements that impact student achievement: Standards, Assessments, Curriculum Framework, Instruction, Materials & Resources, and Safe and Supportive Schools. Schools and educators across Pennsylvania are supported in their efforts to implement SAS by the development of a state-of-the-art portal.

**Executive Forum**

## **Thursday - 12:45 – 1:45 PM**

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### **Technology that thinks with you, not for you**

Eli Luberoff

All Grades

Technology wears two faces. With one, it allows us to share new questions, insights, and ideas. With the other, it can constrain our thoughts, offloading the interesting work of asking and answering questions to an unthinking program. We'll look at ways that tech can think with us and our students.

**Grand Ballroom A**

Desmos Math 6–A1

# Lessons that drive student conversation



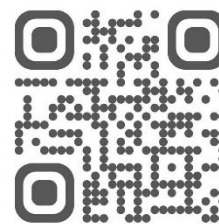
Read the review for grades 6-8 on EdReports.

Desmos Math 6–A1 is an engaging, year-long curriculum that helps every student feel like they belong in the math classroom. Brought to you by the team behind Desmos activities, Desmos Math 6–A1 is a highly rated full-year curriculum, aligned to scope and sequence.



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\*Desmos Math Algebra 1 has not been reviewed by EdReports.

**Amplify.**

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© 2023 Amplify Education, Inc. All trademarks and copyrights are the property of Amplify or its licensors.

### **Activities that get the ENTIRE Class Involved**

Kelly Brent

7-12

These activities involve the WHOLE CLASS and require students to think and engage. The activities are ones that can be used for many mathematics concepts but the presentation uses topics spanning from middle school through Calculus. The activities are tried and true, used by the presenters for years with great success.

### **Give Your Math Curriculum a Boost with First In Math®**

Jennifer Kling

Robert Sun

First In Math

K-9

You have too many resources and with Mathematics, practice is the only way to master it. Using the First In Math® program your students gain a better understanding of key concepts and develop problem solving skills, while allowing them to practice topics in an engaging online environment.

### **Nittany Room**

### **DIY: Setting up a Middle School Math Intervention Program**

Donna Wynkoop

7-9

Setting up a middle school math intervention program from scratch is a daunting task. This session follows the journey of a middle school math interventionist as she wades through the data, research, and programs to figure out how to make the system will work best for students.

### **Gallery Room**

### **Reimagining Fluency through Powerful Routines**

Jessie Oestreich

EdGems Math

7-12

This session focuses on engaging students in activities that promote the development of mathematical fluency. The fluency routines modeled and practiced in this session will provide teachers with highly-effective strategies designed to develop all students' fluency in mathematics, with a focus on flexibility, efficiency, and accuracy.

### **Terrace Rooms**



**EdGems Math**



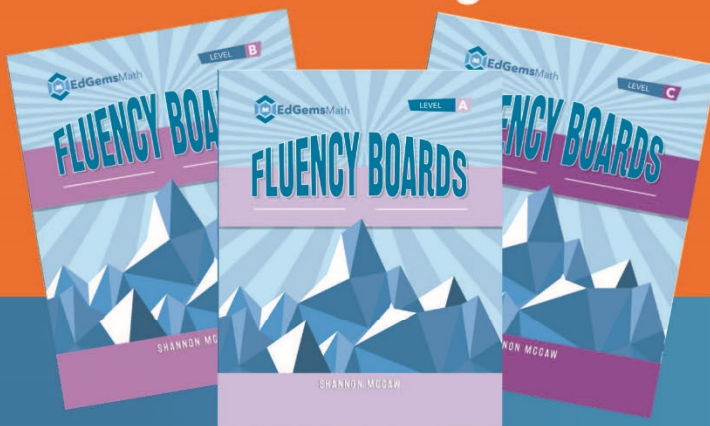
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## **Developing Preservice Teachers' Experiences and Self-Efficacy in Mathematical Modeling Practices**

Reuben S. Asempapa, Ph.D.

4-9

In this session, participants will learn about ambitious teaching experiences, challenging and appropriately nurturing learning environment, and interventions that influence preservice teachers' (PSTs') self-efficacy for integrating mathematical modeling practices in a classroom with culture and community contexts. Additionally, we will discuss opportunities to positively impact modeling practices of PSTs.

### **Director's Room**

## **None of this is "new" math: Tracing meaning vs. memorization throughout US history**

Emily Mainzer

K-6

Communicating with parents and colleagues regarding meaningful teaching of basic operations can be challenging. We will look at how the debate in the United States has existed since math education was established here. Participants will have the opportunity to examine historic curricular materials and brainstorm communication strategies.

### **Executive Forum**

## **Thursday - 2:00 – 3:00 PM**

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### **Celebrating Student Brilliance in the Math Classroom**

Tom Gantt

Amplify/Desmos Math

All Grades

Technology, like Desmos Classroom, can help students transfer mental images of concepts to interactive visual representations that support a deeper understanding of concepts and spark mathematical discourse. This session shifts teaching practices to engage students in visual representations of concepts. Teachers will be prepared to leverage technology to encourage learning.

### **Grand Ballroom A**

### **PAEMST Process and a Math Discussion**

Kevin Mauro, PDE

All Grades

Have a conversation with the PA Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST). Will include the PAEMST application process and a open discussion on the state of mathematics from their perspective.- This will primarily be a question/answer session on relevant topics.

### **Grand Ballroom B**

## **The Treatment of Function Transformations in GeoGebra Classroom Resources**

Xiangquan Yao  
Nicholas Grande  
7-12

This session reports results of an analysis of classroom resources on GeoGebra website regarding function transformations. The results show that existing GeoGebra classroom resources are problematic in their approaches to demonstrating function transformation rules. Informed by the results, we propose a set of GeoGebra applets that support learners to understand function transformations.

**Nittany Room**

## **Spatial Visualization Skills of Preservice Elementary Teachers**

Debbie Gochenaur  
Riana Peters  
K-6

This study investigated students' mathematical problem-solving processes with respect to geometric spatial visualization within a group discovery learning setting to determine whether they have reached a level of conceptual understanding.

**Gallery Room**

## **Why Every Mathematician Should be Vegan**

Michael Tori  
All Grades

Our planet is warming and animal agriculture is a big reason why. Numbers tell us we must change the way we live immediately to continue living comfortably. Math tells us going vegan is the fastest, most effective, and easiest solution.

**Terrace Rooms**

## **Cooperative Learning Techniques in the Classroom**

Marian E Avery  
All Grades

Cooperative Learning is a successful teaching strategy in which small teams, each with students of different levels of ability, use a variety of learning activities to improve their understanding of a subject. Cooperative Learning activities engage students in challenging and intentional instruction that ensures success for all students. Hands-on workshop activities will include Colored Co-op Cards, Inside-Outside Circle, Pairs Check, Round Robin, Think-Pair-Share, and more.

**Director's Room**

## **From Closed to Open: How to Turn Standardized Test Questions into Engaging Learning Experiences**

Meredith Scheiner

All Grades

Quick Ways to turn any question that requires one answer to a question that is accessible to all learners. During this session, you will be walked through the process of change the questions, engaged in answering the new questions, and be given time to make your own.

**Executive Forum**

## **Thursday - 3:15 – 4:15 PM**

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### **Problem-Based Learning to Unlock Student Understanding**

Tom Gantt

4-12

Problem-Based Learning is a teaching method in which real-world problems are used to promote student learning of concepts and principles as opposed to direct presentation of facts and concepts. This presentation will discuss what is problem-based learning, why it can support student understanding of mathematics and how to implement it.

**Grand Ballroom A**

### **TI Tips for Building Math Confidence for Keystone Exams**

Dana F. Morse

Texas Instruments

7-12

Learn tips and tricks that build math confidence for students in Algebra through Calculus. We will explore how to properly integrate the classroom solutions from TI to make the calculator a true learning tool.

**Grand Ballroom B**

### **How the Science of Reading Impacts Word Problems in Math**

Jonathan Regino

K-3

When assessing a student's ability to solve a word problem they are being assessed on their comprehension skills as well as their schema and conceptual understanding of a math topic. What are the research based methods and Science of Reading methods that help students become successful with word problems.

**Nittany Room**





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## **Owning vs. Renting Knowledge: Using Writing in Mathematics and Guiding Your Students in Answering Open Ended Items on the Algebra I Keystone**

Megan Clementi

7-10

How many times have your students proclaimed, “I can solve the problem, I just can’t explain it?” Students who can solve yet not explain how they solved a problem are renting rather than owning knowledge. Writing in mathematics provides students with opportunities to explore concepts, clarify meaning, elaborate upon what they are learning, and think on paper. You will gain a window into your students’ thinking, have opportunities to refine where needed, and spend less time reteaching.

### **Gallery Room**

## **Using theatre, role play, acting and play writing to share the joy and beauty of mathematics**

Joanne Ward

4-9

Theatre has is a contagious source of joy and laughter for both the audience and the cast. This session explains how teachers can incorporate theatre and role play into math class to improve students’ understanding. Through theater, students’ culture and identities are affirmed as they express their authentic selves.

### **Terrace Rooms**

## **MAGIC: Math Activities that Generate an Interesting Classroom**

Jason Turka

7-9

Learn meaningful math activities you can put into practice right away. Activities may be used as warm-ups, guided practice, and independent practice.

### **Director's Room**

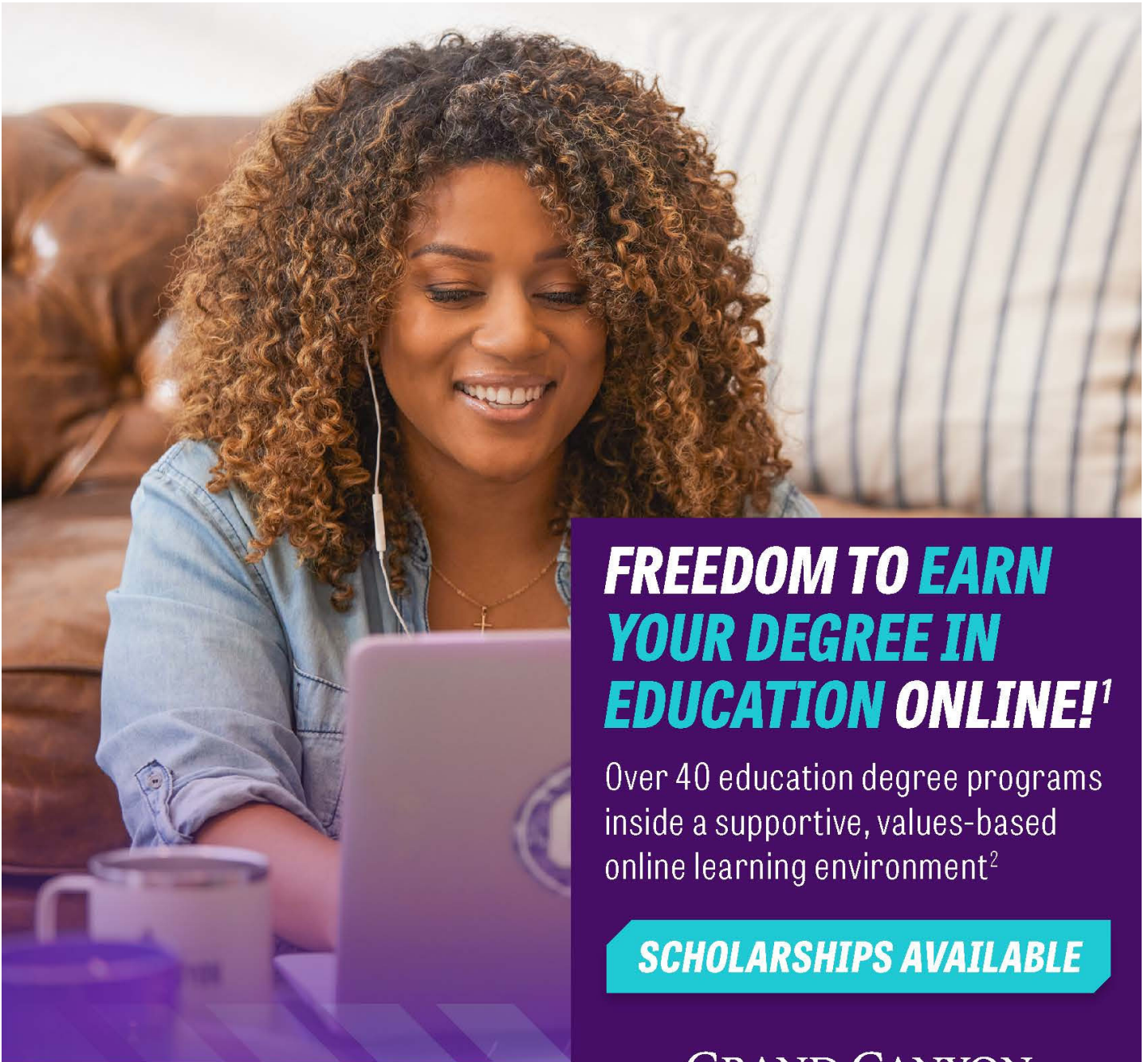
## **You DO Have Time! Fitting Engaging Routines Into Your Lessons**

Abby Gordon

All Grades

Imagine if math class started every day with an engaging challenge, puzzle, or question that got every single student talking. Learn how to start class with a low-floor/high-ceiling routine to get students engaged, increase social-emotional learning, and meet the standards, no matter what curriculum you use.

### **Executive Forum**



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### **FOR MORE INFORMATION, CONTACT:**

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[www.gcu.edu/c/lynn.williams/](http://www.gcu.edu/c/lynn.williams/)

## **Friday - 9:15 – 10:15 AM**

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### **The Advanced Algebra/Finance Connection: A Perfect 3rd/4th Year Math Elective**

Richard Sgroi

10-12

Participants will learn ways to use financial applications and activities in an Advanced Algebra elective with only Algebra 1 as a prerequisite. The math will be explored in the contexts of discretionary expenses, banking, credit, auto ownership, employment, taxes, housing, investing, entrepreneurship, retirement, and budgeting.

**Grand Ballroom B**

### **Encourage Investigation and Conversation with the Desmos Graphing Calculator**

Bob Lochel

7-12

Take part in Algebra investigations from a learner's perspective using the blank slate of the Desmos Calculator. We'll deconstruct the teacher moves which support student investigation and learning. No experience with using the Desmos Calculator is needed and you'll leave with new moves to share.

**Grand Ballroom B**

### **Problem Solving for All Students**

Laurie Thompson

STEMscopes by Accelerate Learning

K-6

Teaching students to make sense of problems, persevere in solving them, and to communicate their mathematical thinking is the cornerstone of quality math instruction. This session will highlight several strategies designed to provide multiple entry points for all students to engage in the problem solving process and to ignite a passion for problem solving.

**Nittany Room**

### **Pattern Breaking**

Jay Schiffman

7-12, All Grades

It is often the case that when analyzing a pattern, a certain behavior always seems to recur such as the output is always prime. Upon further review, that turns out not to be true. Participants will review patterns that eventually fail and discover first counterexamples.

**Gallery Room**

## **Socratic seminars for agency, engagement, equity, access and improved math discourse**

Joanne Ward

4-12

Socratic seminars can improve math discourse in pursuit of agency, engagement and equity of access. As students discuss concepts with peers they develop higher-level thinking and a sense of achievement and identity as mathematicians. Students discover that math can be used to solve relevant problems and address injustice and inequality.

### **Terrace Rooms**

## **Creating Collaborative Classrooms**

Astrida Lizins

CPM Educational Program

7-12

Participants will learn team structures and strategies that can be implemented to support collaborative environments. Participants will engage with teams using a variety of strategies in order to analyze how the modeled strategies increase students' level of confidence in math skills and build trust with teammates and social skills.

### **Director's Room**

## **Are Math Classrooms Neutral? - Exploring the Power Dynamics and Values of the Spaces**

Gary Kaufman

Brandon Schadle

All Grades

A Google image search of “math teacher” suggests that mathematical spaces may feel isolating to students of Color because of the frequency of them being white. As classroom teachers and teacher educators, we will share how we challenge Whiteness in our mathematical spaces to create a more inviting learning environment.

### **Executive Forum**

## **Friday - 10:30 – 11:30 AM**

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### **Trix are for Kids...Not Math Class**

Joelle Cooper

3-12

Keep Flip Flip. FOIL. Alligators and Butterflies. These are common tricks that most kids have learned but they cause more harm than good for mathematical fluency and number sense. During this session, we will look at tricks at various grade levels, discuss the implications of each in future math classes, and find ways to teach without these tricks.

### **Grand Ballroom A**

## **Influence, Impact & Improvement: The CDTs Empower Educators to Make a Difference**

Dan Richards

Carrie Soliday

4-12

Continuous school improvement is dependent on instructional decision making that focuses on student instructional strengths and needs. Empowering educators to interpret data, plan accelerated learning and set goals with students brings about school change in the necessary day-to-day actions. The Classroom Diagnostic Tool honors professional decision-making as the “single most important factor under the control of the school influencing the degree of student learning - quality of teaching.” In this session, participants will overlay elements of Educator Effectiveness with The CDT Cycle of Teaching and Learning. Additionally, participants will calculate reasonable goals for individual student improvement

### **Grand Ballroom B**

## **The Precious First Minutes of Math Class**

Jeremy Cohen, Ph.D,

Hand2Mind

K-8

How should we begin a mathematics class so all students can access the content? What if some small pedagogical changes to the beginning of your class could have a huge impact on ALL of your students? This session will focus on those precious first minutes of class. Participants will learn specific pedagogical strategies which establish a thinking culture, allow for self-differentiation, slow down around meaning-making, and develop critical habits of mind. Your students will get the message from the start that, “I can do this!”

### **Nittany Room**

## **Elevating Student Status with Rough Draft Talk**

Jocelyn Dunnack

Astrida Lizins

CPM Educational Program

7-12, All Grades

In this hands-on workshop, participants will test their problem-solving skills as they collaborate on a rich mathematical task. Teachers will reflect on their identity as learners and connect to the modeled culturally responsive strategies. Participants will gain strategies to support students becoming more independent learners and growing their intellectual capacity.

### **Gallery Room**



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From here2anywhere

## **Implementing Alternative Grading in Math Courses**

Gabe Kramer

Kristen Pueschel

10-12, All Grades

In our classes, we track student proficiency in each learning objective and allow students multiple opportunities to demonstrate their understanding. This incentivizes continued learning past traditional deadlines and gives instructors detailed information about student progress. We will discuss how we implemented alternative grading in our courses, ways to test-drive these techniques, and how to track student progress.

### **Terrace Rooms**

## **When symbols crash like cymbals**

Deana Deichert

7-9

In this session, we will discuss the difficulty that algebra students face in understanding and properly utilizing the symbolic system involved with algebraic processes. Some symbols change from arithmetic while others are brand new to the algebra student. Clear definitions will be presented to help students transition to algebra.

### **Director's Room**

## **CSATS Programs emphasize Math Practices for Secondary STEM Teachers**

Kathy Hill

7-12

The Penn State Center for Science and the Schools collaborates with science and engineering faculty to build teacher workshops that bridge STEM research and K-12 education. In nearly all instances, mathematics is a significant part of the work of science and engineering research, ranging from algebra to differential equations and/or advanced statistical methods. CSATS faculty focus on three particular practices of STEM experts: (a) developing and using models, (b) analyzing and interpreting data, and (c) mathematics and computational thinking. In learning about the ongoing STEM research at Penn State, we examine their work in search for opportunities to make the mathematics accessible to precollege learners. In this session, CSATS' approach to collaborating with scientists and engineers along with opportunities for math educators will be presented.

### **Executive Forum**





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## **Friday - 12:45 – 1:45 PM**

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### **Flexible Math Games to Build Fact Fluency**

Dan Kaufmann

K-6

During this session, attendees will explore a variety of math games that build towards fluency. The strategy-based games will have simple rules and are flexible enough to be used throughout the entire year. After exploring each game, we will discuss classroom implementation and best practices when developing fact fluency.

**Grand Ballroom A**

### **Statistical Thinking with CODAP**

Leigh Nataro

7-12

Is there a relationship between heights of roller coasters and their top speed? How have CO<sub>2</sub> readings changed atop the Mauna Loa volcano? Learn how your students can explore, summarize, visualize and interpret data to answer these questions with the free online tool CODAP (Common Online Data Analysis Platform).

**Grand Ballroom B**

### **Spot It - A Twist on Using Patters to Attain Addition and Subtraction Fact Fluency**

Pat Peffley

K-3

Playful concrete activities, games and chants help students discover basic fact patterns and properties. The color-code guides students to focus on finding patterns first and then computing. It provides a path from fingers to "I just know it" and a foundation for number sense and discourse.

**Nittany Room**

### **Ratios, Rates, and Percents, Oh My!**

Laurie Thompson

STEMscopes by Accelerate Learning

4-9

The study of ratios and proportional relationships begins in the 6th grade and is an integral foundation for the study of functions, which continues through high school and beyond. Participants will build a personal toolbox of effective problem-solving strategies that address ratio reasoning. Three problem-solving strategies will be featured: Double Number Lines, Tape Diagrams, and Tables.

**Gallery Room**

## **The First 30 Minutes: Creating Access and Engagement**

Emily Magee  
Meredith Scheiner  
Jessica Tilli  
Lauren Hammond  
All Grades

How can we leverage the first 30 minutes of class to accelerate learning and engage all students as active mathematical thinkers and communicators? In our school district, we created a road map for the first 30 minutes of class that helps to ensure access to new learning and creates an inclusive environment where all students' voices and ideas are valued. We will share that vision and associated resources, as well as some lessons learned, so that you can rethink how you maximize the first 30 minutes in your class.

### **Terrace Rooms**

## **Connecting Algebra Across Multiple Subjects**

Christa Togans  
7-12

In physics many quantities use one and two-dimensional position, displacement, speed, velocity, and acceleration over time. Vectors require special skills that are connected to Algebra I to Calculus. Students need to use their experiences from one subject to the next to see the progression from Linear Systems to Vector analysis.

### **Director's Room**

## **Posing Engaging Problems to Inspire Mathematical Thinking**

Jay L. Schiffman  
7-12, All Grades

This interactive workshop engages participants in altering the focus of some traditional exercises and tweaking them to produce real problems with multiple solutions. Examples will be selected from number and operations, algebra, geometry, pre-calculus, calculus and discrete mathematics. Such activities promote student confidence and active learning for all.

### **Executive Forum**

## **Friday - 2:00 – 3:00 PM**

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### **Free Open Middle Resources in GeoGebra to Enhance Mathematics Learning**

Robert Pontecorvo  
7-12

Attendees will learn to incorporate the completely free Open Educational Resources (OER) of GeoGebra and GeoGebra Classroom, and specifically the Open Middle resources, to differentiate instruction, personalize instruction, and promote a satisfying student-centered learning experience.

### **Grand Ballroom A**

# MATH NATION

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**Accelerate Learning**

## Grade 6 - Algebra II Mathematics

STEMscopes has partnered with Math Nation to offer a Grade 6-Algebra II curriculum built on illustrative mathematics principles. Interactive, inquiry-based, and customizable, Math Nation gives students round-the-clock access to virtual tutors who help them solve real-world problems, while teachers can facilitate learning and track student progress through assessment tools, reports, and analytics.

### Digital access to includes:

- 4,000+ videos with real tutors who motivate, engage, and support students as they learn
- 400 lessons with teacher prep and family support videos, plus family letters in multiple languages
- Embedded teacher-coaching videos and custom reports for progress monitoring
- Digital platform and video tutorials in English and Spanish
- Interactive practice and assessment tool with instant feedback for students
- Downloadable and editable resources within every lesson
- Written and video glossary of all math terms in English and Spanish

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## **Vertical Alignment**

Kelly Brent

All Grades

There are two parts to vertical alignment. Know what mathematics your students have been exposed to in previous grades/courses. Know what mathematics is ahead of them in the next grade/course and beyond.

### **Grand Ballroom B**

## **Owning vs. Renting Knowledge: Using Writing in Mathematics and Guiding Your Students in Answering Open Ended Items on the PSSA**

Megan Clementi

6-8

How many times have your students proclaimed, "I can solve the problem, I just can't explain it?" Students who can solve yet not explain how they solved a problem are renting rather than owning knowledge. Writing in mathematics provides students with opportunities to explore concepts, clarify meaning, elaborate upon what they are learning, and think on paper. You will gain a window into your students' thinking, have opportunities to refine where needed, and spend less time reteaching.

### **Gallery Room**

## **Activities for Tackling "Yucky" Math Topics**

Bob Lochel

7-12

Participate in games and activities designed to help students build need and generate conversation for traditionally stale math topics. We'll make compound inequalities competitive with a dice game and participate in a lively shared-work task featuring rational expressions

### **Terrace Rooms**

## **Having Students Create Story Problems to Help Learn Adding and Subtracting Integers**

David A. Wiest

4-9

This session will discuss how teachers can implement the use of story problems in their classrooms, to help students struggling with adding and subtracting integers.

### **Director's Room**

## **Supporting Emerging Bilinguals in Math Class**

Karise Mace

Enock Yeboah

4-12

The population of emerging bilinguals continues to grow in Pennsylvania schools. In this session, the presenters will share an experiment conducted with pre-service secondary mathematics teachers and how it led to their exploration of the impact of visual aids and student discussion on mathematics learning for ELL students.

**Executive Forum**

## Keynote Speakers

### Dr. Raj Shah – Pre-Conference Keynote

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#### **Making Math Irresistible**

Every child knows how to persevere, but the fear of getting wrong answers inhibits many. By using the same psychology that video game designers use to make games addictive, teachers can pique student curiosity, help them embrace challenges, and encourage productive struggle even when they haven't mastered the content yet. Learn how to apply video game design principles to make math irresistible.

#### **About Raj Shah:**

Dr. Raj Shah is on a mission to help teachers and parents make math irresistible for kids.

Powered by his love of math, he earned a Ph.D. in Physics in 1999, which led him to a career in R&D at Intel. In 2008, he quit his job and founded Math Plus Academy, an after-school STEM enrichment program for kids from 5 – 14 years old. Dr. Shah believes that everyone can enjoy math, develop strong number sense, and become a perseverant problem solver.

He is a founding member of The Global Math Project, which has helped bring joyful math to over 7 million students around the globe. He also contributes his time to Math Teacher Circles and the Julia Robinson Math Festival.

Dr. Shah is an internationally recognized speaker who has keynoted at international and state-level math teacher conferences and routinely presents at NCTM annual and regional conferences. He also presented at [TEDx Hilliard](#) in 2019. Dr. Shah has also consulted with schools and districts throughout the United States.

### Dr. Shelly Jones – Thursday 10:30 – 11:30 AM

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#### **The “Math”uration of Culturally Relevant Pedagogy: What It Is and Why We Need It**

“No curriculum, standards, or wording will lead to the automatic creation of culturally relevant teaching without powerful new thinking about the nature of mathematics, who it is for, and what it can be used for” (Matthews, Jones & Parker, 2022). Engaging in Culturally Relevant Math Tasks helps teachers to design inspiring mathematics learning experiences driven by high-quality mathematics tasks that connect to students’ lived experiences. Culturally relevant mathematics teaching engages and empowers students, helping them learn and understand math more deeply and make connections to themselves, their communities, and the world around them. Dr. Shelly Jones, co-author of the book, will discuss how teachers can select, adapt, and implement math tasks that build powerful learners.

**Grand Ballroom A & B**

**Howie Hua – Friday 8:00 – 9:00 AM**

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**Sparking Curiosity**

Math (and education in general) should spark curiosity. How do we do that in the math classroom? How do we show that math is exciting, creative, and not just about using a formula? This session will go over ways to make students more curious learners.

**Grand Ballroom A & B**