

REDISCOVERING JOY

IN TEACHING AND LEARNING
MATHEMATICS

APRIL 10–13

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Program Guide



NCTM 2024

Virtual Conference

#NCTMVC24

Conference Strands

Rediscovering Joy in Teaching and Learning Mathematics

To bring joy into our mathematics teaching and learning, students' curiosities need to be at the center of our classroom instruction. By critiquing the world around them, students develop questions, which turn into opportunities for students to (re)discover the play, joy, and beauty of mathematics in the classroom. These inquiry processes allow students multiple access points to mathematics and allow teachers opportunities to embrace the unique mathematical strengths each student uses when making connections among mathematical ideas, engaging in student-to-student discourse, and making meaning of the world around them. We embrace these characteristics in mathematics teaching and learning in the hopes to also hinder ability grouping, gender grouping, tracking, and deficit-based mindsets. This conference promotes ways in which teachers empower their students through their prioritization of student-centered instruction that encapsulates the wonder and joy students experience in learning mathematics.

Rejoicing in the Assets and Identities of All Students

Valuing each student as an individual, we plan intentional learning experiences that celebrate students' assets and identities. These assets/identities include but are not limited to developmental variations, neurodiversities, race/ethnicity, language, gender, sexual orientation, economic class, country of origin, culture, community, and interests. When we bring joy in learning experiences, we provide powerful opportunities for students to understand mathematical ideas, build their positive mathematical identity, foster their love of learning mathematics, make connections, and see mathematics in the world around them. The more we understand and respect the individual's background and strengths, the more we understand their particular needs. *How do we nurture and foster a sense of joy in the mathematics classroom through learning experiences? How can we, as teachers, understand, celebrate, and utilize the strengths and differences that make our classes unique? How do we situate students in tasks in which they can find joy in productive struggle that is appropriately supported?* Sessions in this strand might include, but are not limited to, the following: Improving Mathematical Identity and Agency, Creating a Sense of Belonging in the Mathematics Classroom, Instructional Strategies to Celebrate Students' Assets, Using Student-Centered Instruction.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

By dismantling "inequitable structures, including ability grouping and tracking" (NCTM 2020, *Catalyzing Change in Early Childhood and Elementary Mathematics: Initiating Critical Conversations*, p. 25), teachers are tasked to differentiate their mathematics instruction in new and innovative ways. We suggest joy should be at the center of this differentiation, allowing students choice and opportunities to play with the mathematics with an inquisitive mindset. In particular, we emphasize the importance that cognitively demanding tasks have in this work, whereby students are supported in their access to mathematics through multiple access points. Moreover, these foci could also allow for discussion around varied and student invented strategies and pathways. Through this differentiated instruction, we wonder *How can teachers embrace their students' assets when solving problems in authentic and meaningful ways? How can teachers both support and challenge students with varying mathematical strengths and interests? How can teachers develop an environment that uses students' curiosity at the center of their mathematics instruction?* Sessions in this strand might include, but are not limited to, the following: Providing Student Choice in Their Strategy Development, Elevating Pathways While Dismantling Tracks and Deficit Mindsets, Offering Unique Learning Trajectories That Explicate Space for Novel Learning Opportunities, Eliciting and Using Evidence of Student Reasoning at the Center of Instruction, Investigating Co-teaching Structures to Explore Collaborative Inclusive Practices, Preparing Mathematics Instruction That Ensures Equitable Learning Opportunities for Multilingual Learners.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

The idea that deep mathematical understanding can happen only within the beige walls of a "traditional" math classroom is a thing of the past. This strand will focus on effective teaching practices that help develop students' mathematical proficiencies and processes. By doing so, we honor students' personal experiences, identities, cultures, backgrounds, and prior math experiences to nurture deep learning of mathematics content while instilling a joy of learning mathematics. *What routines can be implemented to honor individual perspectives? Which instructional methods promote understanding and growth in the math classroom? How can student mathematical discourse, student thinking, and opportunities for students to joyfully engage in meaningful math practices be encouraged through strategies, routines, and tasks?* Sessions in this strand will provide participants with strategies to implement new perspectives—from both teacher and student—that will enhance joy in the math classroom. Sessions in this strand may include, but are not limited to, the following: Effective Teaching Practices, Student-Led Activities, Choice in Learning, Hands-on Engagement, Real-World/Personal Connections, Recognizing Individual Success.

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Supporting students to understand that obtaining and retaining their mathematical knowledge has greater significance than a letter grade. These experiences should cultivate a mindset devoid of barriers that hinder student growth while promoting a positive outlook on mathematics and students' mathematical identities. In this strand, we will focus on how teachers navigate the next steps when examining formative and summative assessment data. We see assessment data as an intentional tool to support students in understanding and building on their positive mathematical identity, and not a barrier to mathematical opportunities and experiences. *How can mathematics educators use data analysis to promote student ownership in their learning and success? How can data support the development of individualized instructional practices?* Sessions in this strand may include, but are not limited to, the following: Assessment Design in Mathematics, Teachers Using Assessments to Plan Next Steps, Students Using Assessments as a Form of Feedback and Ownership, Critical Conversations About Equitable Assessment Design, Recognizing the Bias in Traditional Assessment Practices, Implementing Alternative Assessment Practices (e.g., Ungrading), Providing Asset-based Feedback, Leveraging Multiple Points of Data to Support Every Child, Dismantling Grade-Driven Motivation.

Uplift, Empower, and Promote a Sense of Agency in Mathematical Communities

NCTM engages in advocacy to focus, raise awareness, and influence decision-makers and the public on issues concerning high-quality mathematics teaching and learning. "Rehumanizing mathematics seeks to not only decouple mathematics from wealth, domination, and compliance, [but to recouple] it with connection, joy, and belonging" (Gutiérrez 2018, *Rehumanizing Mathematics for Black, Indigenous, and Latinx Students*, p. 4). In this strand, we will focus on advocacy and community work that can support and facilitate joy in the teaching and learning of mathematics. *What do humanizing practices and policies look like in and out of the mathematics classroom? What is possible when we learn about and leverage knowledge of our students' communities, including the knowledge and wisdom of community members? How can our communities be used as mathematical resources and support mathematics teaching and learning in the classroom?* Sessions in this strand might include, but are not limited to, the following: Dismantling Inequitable Structures, Challenging Spaces of Marginality and Privilege, and Redefining What Counts as Knowing Math and Who Can Be Good at Math, Sharing Policies or Practices That Elevate the Professional Status of Mathematics Teachers and Promote Joyful Learning Communities, Employing Strategies to Recruit and Retain Mathematics Teachers, Identifying the Political Pressures that Teachers are Currently Facing and Sharing Strategies for Creative Insubordination in Mathematics Teaching (Gutiérrez 2016).

Catalyzing Change through Equitable Technology Integration

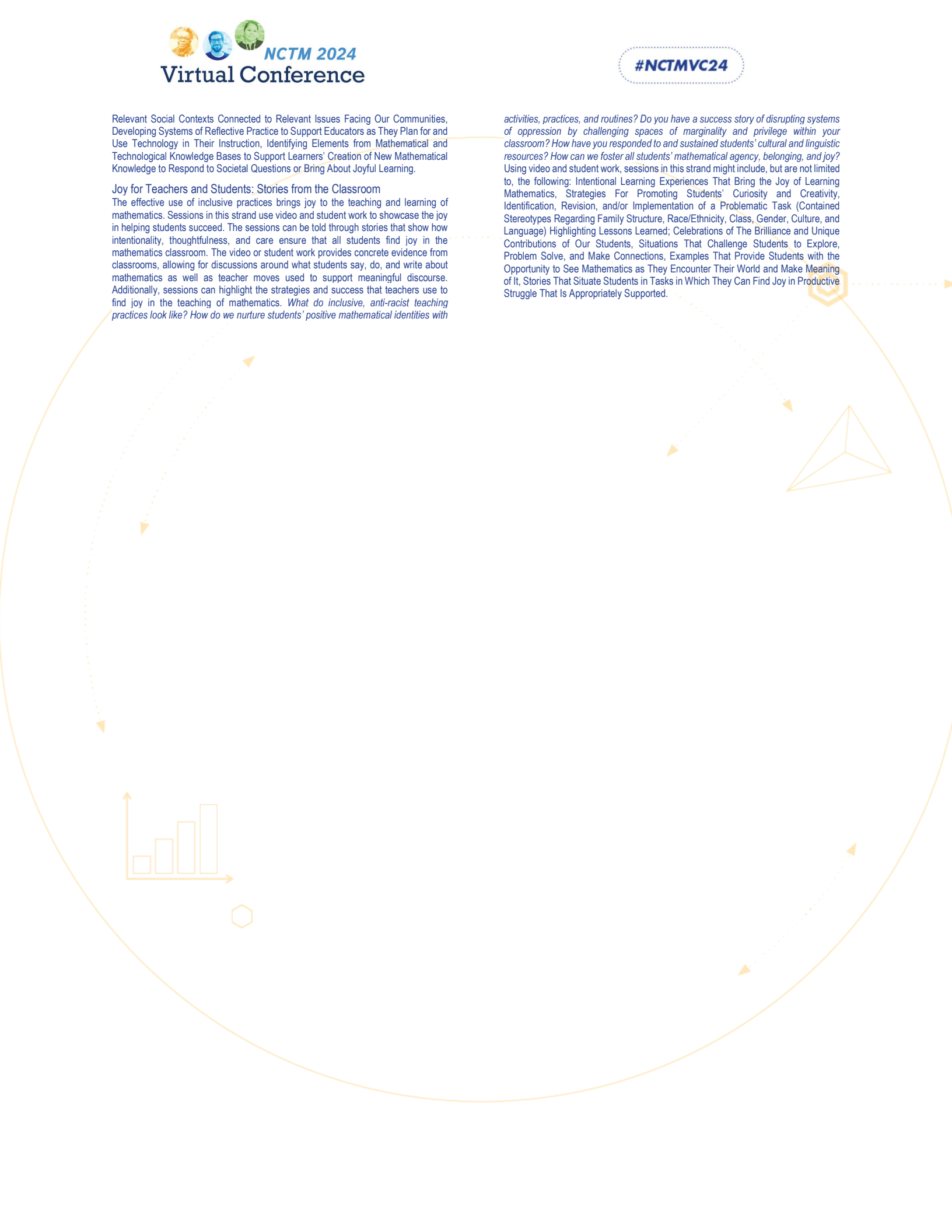
Using the capabilities of technology is essential for educators and learners to inform and transform how they learn, experience, communicate, assess, and do mathematics. Technology should be used to develop and deepen learner understanding, stimulate interest in the mathematics being learned, and increase mathematical proficiency. By harnessing technologies to facilitate computations and test conjectures, students and teachers alike find joy in creating new-to-them mathematical content. Aware of limitations and excited by possibilities, teachers implement technology-infused activities to provide more equitable access and opportunities for each and every learner to actively engage and participate in the learning of mathematics. *How does our use of technology position each and every student as a powerful doer of mathematics? How can we use technology in transformative ways to communicate safely and productively about mathematics, within and across different mathematics education communities (e.g., among students, with colleagues, with families)? How can we use technology to support students' interest in and sense making about relevant social contexts facing our communities? How can teachers and teacher leaders support one another as we continue to develop and reflect on our deepening of technology integration and a vision of high-quality, equitable instruction with technology that is aligned with NCTM's effective and equitable teaching practices?* (2014, *Principles to Actions: Ensuring Mathematical Success for All*) Sessions in this strand might include, but are not limited to, the following: Showcasing the Brilliance of Learners of All Ages, Abilities, and Backgrounds, Leveraging Technologies for Collaborations and Communication to Increase Opportunities for Authentic Learning Experiences That Promote Learners' Success, Creating Opportunities to Support the Reasoning and Sense Making of

Relevant Social Contexts Connected to Relevant Issues Facing Our Communities, Developing Systems of Reflective Practice to Support Educators as They Plan for and Use Technology in Their Instruction, Identifying Elements from Mathematical and Technological Knowledge Bases to Support Learners' Creation of New Mathematical Knowledge to Respond to Societal Questions or Bring About Joyful Learning.

Joy for Teachers and Students: Stories from the Classroom

The effective use of inclusive practices brings joy to the teaching and learning of mathematics. Sessions in this strand use video and student work to showcase the joy in helping students succeed. The sessions can be told through stories that show how intentionality, thoughtfulness, and care ensure that all students find joy in the mathematics classroom. The video or student work provides concrete evidence from classrooms, allowing for discussions around what students say, do, and write about mathematics as well as teacher moves used to support meaningful discourse. Additionally, sessions can highlight the strategies and success that teachers use to find joy in the teaching of mathematics. *What do inclusive, anti-racist teaching practices look like? How do we nurture students' positive mathematical identities with*

activities, practices, and routines? Do you have a success story of disrupting systems of oppression by challenging spaces of marginality and privilege within your classroom? How have you responded to and sustained students' cultural and linguistic resources? How can we foster all students' mathematical agency, belonging, and joy? Using video and student work, sessions in this strand might include, but are not limited to, the following: Intentional Learning Experiences That Bring the Joy of Learning Mathematics, Strategies For Promoting Students' Curiosity and Creativity, Identification, Revision, and/or Implementation of a Problematic Task (Contained Stereotypes Regarding Family Structure, Race/Ethnicity, Class, Gender, Culture, and Language) Highlighting Lessons Learned; Celebrations of The Brilliance and Unique Contributions of Our Students, Situations That Challenge Students to Explore, Problem Solve, and Make Connections, Examples That Provide Students with the Opportunity to See Mathematics as They Encounter Their World and Make Meaning of It, Stories That Situate Students in Tasks in Which They Can Find Joy in Productive Struggle That Is Appropriately Supported.



OnDemand

Watch **OnDemand** presentations 24 hours a day. Starting 10:00 a.m. (ET), Wednesday, April 10th

2 Exploring Rational Functions Using Handheld Technology

10-12 Session

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Intermediate

Exploring rational functions graphically, numerically, and algebraically with the help of technology promotes student success. The foundational opportunities for discovery, collaboration, and communication provide essential skills for success at the calculus level. In this session, we will discuss how technology can be leveraged to build student exploration and knowledge of rational functions in the courses leading up to calculus.

Kimberley Thomas, Moon Valley High School, Glendale Union High School District, Phoenix, Arizona

Twitter: @Kim_Math

Veronica Carlson, Classroom Coach, Glendale, Arizona

3 Exploring the Use of Student Made Children's Book to Enhance Mathematical Understanding

6-8 Session

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Intermediate

During this session, attendees will learn about a children's book project that has been used over the years to help students understand middle-grade mathematics topics such as the Pythagorean theorem, balancing checkbooks, and adding/subtracting with integers. Sample book examples with student work will be shared, as well as ways in which to modify the project to meet student needs.

Ann Wheeler, Texas Woman's University, Denton

awheeler2@twu.edu

4 Open Your Lessons With These Productive and Powerful Do Nows Done Better!

10-12 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Learn how to build confidence, competence, and interest using 20+ strategies designed to fortify the first 5 minutes of any class. The strategies engage students in activities that can set the stage for the work to follow, assess prerequisites, expand upon a prior lesson or concept, and revisit prior learning differently. These Do Nows include quotes, essential questions, foreign language texts, explorations, historical facts, partner problems, problem posing, quizzes, and more.

Richard Sgroi, Bedford Schools (Ret.), Rhinebeck, New York

5 Quantitative Literacy: The Answer to "There is reading in every content"

6-8 Session

General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

As a mathematics teacher, being told, "There is reading in every content" can sometimes be overwhelming. Where is the reading when teaching the concept of equivalent fractions, calculating loan costs, or calculating the rate of change of a linear function? Surprisingly, there is quite a bit of reading in mathematics, and it's just not through a literacy lens.

Participants will identify and explore quantitative literacy and its impact in the instructional application and beyond the class.

Diane Kue, Seidlitz Education, Arlington, Texas

Twitter: @problem_word

7 Math Club Magic: Nurturing Elementary Students' Positive Mathematics Identity Development

3-5 Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Unleash the potential of your students through a math club that promotes positive mathematics identities! Join me as I share my journey of facilitating a math club that empowers students to find a sense of belonging in the world of mathematics. Using equity-based mathematics instruction and strengths-based practices, this dynamic approach nurtures students' love for mathematics and fuels their self-confidence and passion for problem-solving. Let's make math magical together!

Kayla Blankenship, Orange County Public Schools, Orlando, Florida

Twitter: @mindfulmathk5

9 Hands-on Authentic Assessments in the Secondary Classroom

10-12 Session

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - Introduction to the Topic

Are you looking to create rich performance tasks that apply student mathematical content knowledge? From bungee-jumping action figures to rocket launches and curve sketching contests, this session gives practical, hands-on examples of methods of assessing student learning in novel and engaging ways that foster a joy-filled learning environment.

Pete Wisniewski, Germantown Academy, Fort Washington, Pennsylvania

10 There Is NO growth Mindset Without a PATHWAY Mindset



General Interest Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

The pathway mindset is moving from a mindset that a child is either "low" or "high" in math to understanding that each subject has too many standards within it to simply place that one label of ability on a student—and taking it further to allow the students to be aware of their levels or "pathways" so that they know their areas in need of improvement and celebrate any successes and growth, as well as being given opportunities to learn on their individual pathway for EACH individual standard!

Jacqueline Dass, My Math Path, Conroe, Texas

Twitter: @mymathpath

13 Rx for Math Misconceptions: Antidotes for Mathematical Misunderstandings



6-8 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

In "The Unschooled Mind," Howard Gardner discusses students' misconceptions of mathematics. He highlights their tendency to apply rigid algorithms while unquestioningly following authority. Traditional methods of reteaching often fail due to deeply ingrained misconceptions. What's necessary is a dynamic approach employing stories, games, and debates to dismantle entrenched misconceptions and foster new understanding. This presentation showcases real teaching instances that employ these techniques.

Ihor Charischak, Ihor Charischak, Venice, Florida

Twitter: @climeguy

14 Bringing Project-Based Learning to Life in Middle School Mathematics



6-8 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

Why do we have to learn this? Middle school teachers, are you sick of hearing this question? Enter Project-Based Learning. PBL brings equitable learning opportunities to the forefront. By exploring real-world problems and finding mathematical solutions, students engage more deeply and enthusiastically in our classrooms. Explore middle school projects centered on enhancing student agency and voice. Leave with resources to implement PBL in your classroom and answer your students' "why."

Maggie McHugh, University of Wisconsin-La Crosse

Twitter: @maggielemchugh

15 Navigating Math Apathy and Building Positive Math Identities



General Interest Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Mathematics educators often encounter the challenge of math apathy, where students express disinterest or disengagement towards math. This session delves into understanding the root causes of math apathy and presents practical strategies to build positive math identities among students. By addressing the underlying emotions and fostering a supportive classroom environment, educators can empower students to develop a strong sense of self-efficacy and enthusiasm for math.

Laurie Ferry-Sales, Ferry Consulting, Carmel, Indiana

Twitter: @LaurieAFerry

16 Examine Pedagogical Choices That Bring Joy and Richness of Risk Taking and Sense Making.



General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - In-Depth

In this webinar, we will look into the critical role of rich tasks in generating high-quality opportunities for student learning. We will examine pedagogical choices that bring joy and richness of risk taking and sense making throughout implementation. Teachers will explore rich uses of everyday tasks and expand their capacity to engage students as mathematicians to build efficacy, agency, and math identity. Teachers will enjoy engaging in learning through the use of mathematical visualization.

Bina Kachwalla, Inquiry Learning Ltd, Auckland, New Zealand

17 Reinventing Online Discussions Using Digital Technologies



Higher Education Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

This presentation will focus on reinventing online discussion activities by focusing on the activity. Digital learning applications such as Desmos, PlayPosit, Nearpoint, and Kahoot! are used to engage students with math concepts in meaningful and engaging ways. Formatting of discussion activities will be explored. Student reactions to this new formatting will be shared. Tips and ideas for how to make it happen in any class are explored.

Louis Freese, DeVry University, Thornton, Colorado

18 A School of Mathematicians: A Year-Long Plan to Build Your School's Mathematics Program



Coaches/Leaders/Teacher Educators Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

In a school of mathematicians, students, teachers, and leaders see themselves and each other as math people and as mathematical colleagues. As they engage in rigorous and interesting math tasks, they strengthen their math identities and agency while growing their math understanding and skills. In a school of mathematicians, math is experienced as relevant, empowering, and joyful. Learn how to plan and implement a year-long learning journey to strengthen your school's mathematics program.

Holly Burwell, Heinemann Publishing and Great Falls Public Schools, Montana

Twitter: @holly_burwell

Susan Chapman, Heinemann Publishing, Portsmouth, New Hampshire

20 Enjoying the Human Creation of Mathematics: A Focus on a Rubric-Based NASA Technology Project

 10-12 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

This presentation will share how a project on NASA technology in the Apollo program is implemented in a high school math classroom. While the project is interdisciplinary, the presentation will focus on the math emphasized in the project. The project, student work, and rubrics will be shared with attendees. The project offers an alternative to traditional learning and assessment routines that invites students to include their personal experiences while engaging in meaningful math practices.

Jaime Krause, Hunterdon Central Regional High School, Lawrenceville, New Jersey

Jan Yow, University of South Carolina, Columbia

22 My Geometry-Thinking Classroom

 8-10 Session

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Intermediate

This presentation relays a personal experience applying the ideas behind Peter Liljedahl's book "Building Thinking Classrooms in Mathematics." I want to share the implementation steps in two of my classrooms on two continents: Hong Kong and Lisbon. What were the typical highs and lows of the process, how can this help pre-IBDP students, and why do I hope you try it yourself after this presentation?

Raquel Bernardo, Carlucci American International School of Lisbon, Sintra,

23 Annotation: Making Discourse Visible to Deepen Mathematical Understanding

 General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

As we facilitate meaningful mathematical discourse, we must integrate multiple modalities to support diverse learners. Through annotation, we create a visual representation of students' verbalized thinking and authentically listen to, honor, and represent what students say - a creative and fun endeavor! Join us to learn features of effective annotation and build your annotating muscle so that you can better elicit and use evidence of student thinking in your classroom.

Amy Lucenta, Fostering Math Practices, Natick, Massachusetts

Twitter: @AmyLucenta

Grace Kelemanik, Board of Directors, National Council of Teachers of Mathematics, Reston, Virginia; Fostering Math Practices, Natick, Massachusetts

24 Reimagining Math Education: Engaging Families and Communities

 Coaches/Leaders/Teacher Educators Session

Session Content Level - Introduction to the Topic

In my presentation, I will discuss my experiences with math education as a K-12 student and young adult, addressing key historical facts about math education and prevalent myths surrounding mathematics. I contrast my early experiences with present-day math education programs in three different U.S. cities. I also provide practical guidance for engaging families and communities in math education and describe ways teacher educators can take up these topics in math content/methods courses.

Jose Francisco Gutierrez, University of Utah, Salt Lake City

25 A Teacher's Role in Reflection: Setting Up Classrooms for Assessment Self-Reflection and Feedback

 6-8 Session

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - Introduction to the Topic

In this session, we will read examples of children's literature designed to emphasize the importance of making mistakes and what to do afterward. Then, we will look at a color-coding self-reflection routine that can be implemented and adapted for each classroom for teachers to utilize data to drive instruction, and for students to take ownership of their learning.

Melissa Kings, Self-employed, Austin, Texas

26 Exploring Connections Between Forms of Linear Equations

 8-10 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Students frequently struggle with connecting different forms of linear equations and with forms of absolute and quadratic equations. After deriving different forms of linear equations from the slope formula, we'll consider ways to help students investigate these topics symbolically and graphically and use their prior knowledge to determine which form of equations to use in different circumstances.

Gina Wilson, Knowles Teacher Initiative, Ann Arbor, Michigan

27 Collaborative Inquiry to Deepen Equitable Teaching Practices

 General Interest Session

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - Introduction to the Topic

Collaborative inquiry cycles can be used to deepen learning opportunities for all of our students. Explore how to ask colleagues to participate, refine inquiry questions to investigate, use protocols, select qualitative and quantitative data sources, address scheduling logistics, and talk about how student and teacher identities and placement within systems of power affect instruction, learning, and access to mathematics. Learn how to use what you learn to improve instruction.

Gina Wilson, Knowles Teacher Initiative, Ann Arbor, Michigan

28 Inviting Joy (Naturally!) Into Learning Basic Facts

 3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Children spend many years of their young mathematical lives trying to remember basic facts. Sadly, those who don't do well and many who do often experience little joy in the process. Instead, learning basic facts can become a bleak and onerous chore, contributing to the onset of mathematics anxiety that can limit access to learning throughout their lifetimes. Why not invite joy into the learning? This session shares ideas for doing so naturally and invites your ideas.

April Leder, Alpine School District, Utah, Anacortes, Washington

Eula Ewing Monroe, Brigham Young University (Emerita), Provo, Utah

29 Using Progressions and Learning Trajectories to Guide Intervention in Multiplication and Division



3-5 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Explore a mathematical task, examine where multiplication and division concepts and skills fall in standards, and research how children develop mathematical understanding. See how learning progressions and learning trajectories are each uniquely helpful in planning for and providing mathematics intervention for students in the elementary grades.

Shannon Olson, Olson Educational Services, LLC, Lehi, Utah

30 Leveraging Technology and Hands-on Activities to Foster Preschoolers Spatial Orientation Learning



Pre-K-2 Session

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Introduction to the Topic

This presentation will share ways to help preschoolers build spatial knowledge through hands-on activities, read-aloud stories, and digital games on touch-screen tablets, with an accompanying digital teachers' guide and connected family resources. We will share findings from a classroom comparison study that suggests this approach was feasible for teachers and led to increased spatial learning for preschoolers and a small pilot study with families.

Ashley Lewis Presser, Education Development Center, South Hempstead, New York

Emily Braham, Education Development Center, Waltham, Massachusetts

Regan Vidiksis, Education Development Center, New York, New York

32 Engaging in Data Science With Preschoolers: Benefits, Challenges, and Future Directions



Pre-K-2 Session

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Introduction to the Topic

This presentation will share what we learned from co-designing and researching a preschool data science intervention with teachers. Teachers can engage preschoolers in data science using hands-on manipulatives, books, movement, and developmentally appropriate investigation topics. A free teacher-facing digital app allows teachers to scaffold the data collection and analysis process, generate data visualizations, and utilize digital features that foster rich mathematical discussions.

Ashley Lewis Presser, Education Development Center, South Hempstead, New York

Jessica Young, Education Development Center, Waltham, Massachusetts

Emily Braham, Education Development Center, Waltham, Massachusetts

Regan Vidiksis, Education Development Center, New York, New York

34 BrainSTEM: Engaging Neuroscience in Math Instruction



3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Based on new research in the educational neurosciences, this interactive session engages participants in activities demonstrating how emotions, belief systems, student choice, retrieval practice, and brain-informed instructional and assessment strategies can positively affect students' conceptual understanding of mathematics.

Bobbi Hansen, University of San Diego, California

35 Using Reasoning Routines to Increase Student Discourse and Build Math Community



General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Reasoning routines are an effective way to get students thinking and talking. But have you reflected on how you use them to change the culture of your classroom? Join us to uncover the magic that happens when students are talking, thinking, and having fun. Learn specific teacher moves to foster a classroom culture that empowers students to become active participants, critical thinkers, and lifelong learners through the transformative force of reasoning routines.

Skip Tyler, CTLG Consulting, LLC, Dublin, Virginia

Twitter: @SkipTylerMath

37 The Mathematics of Robotics



10-12 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

Robotics in STEM classes tends to focus on mechanical design and elementary coding. Enormous missing pieces in this approach include the mathematics behind many technical details in industry and robotics research. We will discuss some of those missing pieces and share activities that connect real applications of robotics to topics that are too often abstract in our classrooms, including trig, matrices, cubic polynomials, combinatorics, exponential functions, and more.

Jededyiah Williams, Nantucket High School, Massachusetts

Twitter: @jededyiah

38 Using High Leverage Practices to Adapt Math Teaching Practices for Diverse Learners



8-10 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

All students deserve access to rich, meaningful math, and teachers may need to adapt their instruction to meet the needs of neurodiverse learners. The High Leverage Practices for students with disabilities can provide a framework for implementing the Effective Mathematics Teaching Practices with diverse students. This session uses examples to show how secondary math teachers can help all students engage in rich mathematical exploration.

David Johnston, Northside ISD, San Antonio, Texas

Twitter: @Johnston_MSMath

Aaron Logan, Northside ISD, San Antonio, Texas

39 Welcome to the Fun Zone! A FREE Problem-Solving Unit Created to Promote Multiplication Fluency

 3-5 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Join members of the Office of Mathematics Improvement (OMI) from the Alabama State Department as we explore the Fun Zone Recreational Center.

The Fun Zone Recreational Center is a free problem-solving-based unit created by OMI to meet the requirements of instructional practices mentioned in the Alabama Numeracy Act. This unit was created to help students build fluent strategies for multiplication and division.

Monica Bramlett, The Office of Mathematics Improvement at the Alabama State Department of Education, Springville
Twitter: @monica_bramlett

Paula Ponders, The Office of Mathematics Improvement at the Alabama State Department of Education, Florence

Noel Tillison, The Office of Mathematics Improvement at the Alabama State Department of Education, Piedmont

40 Approaching Mathematics Like a Mathematician: Building Mathematical Activities for K-12 Students

 3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

This project studied elementary students' efficacy in activities connected to unsolved math problems. Researchers planned a week-long mathematics enrichment camp for elementary students in the 3rd, 4th, and 5th grades. Camp participants engaged in fun, hands-on activities, and games to encourage them to redefine their understanding of mathematics. Preliminary results from surveys and observational data showed increased participants' confidence and enjoyment of mathematics.

Julian Viera, Berea College, Kentucky

Kristen Barnard, Berea College, Kentucky

41 Word Problems and English Learners? Classroom video and strategies for ensuring success for all!

 3-5 Session

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Intermediate

Come join us as we consider how to support English Learners (and all learners) to access word problems from the K-5 OA standards. We'll watch videos of presenters engaging diverse students in making sense of the problems and then consider how the teacher can wisely select and sequence student sharing of math strategies while ensuring others are engaged in active listening and learning. Break-out rooms will allow participants to discuss and analyze classroom videos.

Karajejan Hyde, University of California, Irvine

Danyelle Dale, University of California, Irvine

42 Service Learning in Math Class: Connecting Math to Real-World Need and Civic Engagement.

 General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

This session demonstrates how math can be taught through service learning while maintaining rigor and adhering to math curriculum standards. Service learning and the application of math in service learning will be discussed. Example service-learning projects, materials, and lesson plans for elementary, middle, and high school math classes will be shared. Teachers will learn to guide students to discover practical math applications while strengthening civic engagement and an ethic of service.

Joanne Ward, Taipei Adventist American School, Taiwan

Twitter: @JoanneWard

43 Culturally Responsive Pedagogy for Student Identity, Teamwork, and Mathematical Problem Solving.

 General Interest Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

This session shows how math teachers incorporate culturally responsive pedagogy (CRP) to honor student's identity, foster teamwork and promote mathematics problem solving. Sample lesson plans, teaching materials, and representative student work from CRP lessons will be shared. CRP helps students develop a personal meaning for the mathematic content they are taught. With CRP, students can use math as a lens to see the world around them and find themselves as part of the community.

Joanne Ward, Taipei Adventist American School, Taiwan

Twitter: @JoanneWard

44 Lower Cognitive Load With MathReps and Math EduProtocols

 General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

#MathReps and Math #EduProtocols are teaching activities that help students grasp math concepts through various representations, boosting understanding and connections between ideas. These structured routines offer clear steps for efficient learning, encouraging collaboration and engagement. Benefits include heightened engagement, better understanding, problem-solving skills, and efficient learning. Teachers at all levels find success with these strategies.

Lisa Nowakowski, KCUSD, King City, California

Twitter: @NowaTechie

45 My Four Favorite Tasks for Promoting Problem Solving in the Elementary Grades

 3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

Great problems invite conjecture, encourage communication, promote collaboration, and -- sometimes -- inspire chaos. During this session, we'll examine puzzles, games, and activities that motivate third-, fourth-, and fifth-grade students to get involved with numbers, operations, fractions, and geometry. In addition, we'll consider the characteristics of a classroom culture that foster problem-solving.

Patrick Vennebush, The Math Learning Center, Portland, Oregon

Twitter: @pvennebush

46 Seeing the Joy of Mathematics Through Our Community Surroundings

 General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

This session will provide ideas for helping students to see the joy of mathematics in their everyday surroundings. I will also provide suggestions for implementing deep thinking routines and building mathematical discourse using images from their surroundings and other places. The content of this session can be applied to all grade levels of mathematics.

Lisa Stonefoot, Erie 2 BOCES, Angola, New York

47 Beyond Project-Based Learning: In Pursuit of Achieving Liberatory Education in the Math Classroom

 General Interest Session

Session Content Level - Intermediate

In this presentation, we reflect on how Project-Based Learning often falls short of liberatory education goals through an experience in a middle school math class. We examine how and why it is an insufficient model for student empowerment. Teachers will gain insight into what liberatory instruction asks of educators so that math education empowers student voices, centers their funds of knowledge, and grows students not just as mathematicians, but also as change makers in their communities.

Gary Kaufman, Pennsylvania State University, State College, PA,
Miriam Ruzicka, Pennsylvania State University, State College

48 Reimagining Kindergarten Mathematics: A Brand-New Start

 Pre-K-2 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

For many students, Kindergarten is the first year of school. Unfortunately, math is sometimes an afterthought in Kindergarten. Research shows early numeracy skills predict future math and literacy success. Deepen your understanding of the critical math concepts in this early grade and how to support teachers and administrators in putting mathematics on equal footing with literacy. To anchor our conversations, we will unpack rich tasks and view videos of students engaging in mathematics.

Marria Carrington, Mount Holyoke College, South Hadley, Massachusetts
Twitter: @marriamath

49 Emphasizing Structure: Connecting Strategies to Properties

 3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

Many educational materials guide teachers to teach students strategies like Make a 10 or Partial Quotients/Partial Products without mentioning the utilized properties. Algebraic properties transcend all grade levels K-12. By exploring tasks and examining student work, teachers will leave with ideas on connecting strategies and properties to illuminate and enhance student learning.

Jeremy Winters, MTSU, Murfreesboro, Tennessee
Dovie Kimmins, MTSU, Murfreesboro, Tennessee

50 Utilizing Students' Experiences as a Bridge for Engagement in Equitable Mathematical Modeling Tasks

 6-8 Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

In this presentation, participants will learn about what themes have been identified in middle school students' interview data centering on their life experiences. The interviews informed the development of equitable mathematical modeling tasks, specifically The Wheelchair Ramp and Temporary Skate-Safe Area Modeling Tasks. Discussion will focus on the implications in involving students' experiences in the development of equitable mathematical modeling tasks.

Kayla Sutcliffe, University of Florida, Gainesville

Twitter: @kaylajsutcliffe

Hyunyi Jung, University of Florida, Gainesville

Corey Brady, Southern Methodist University, Dallas, Texas

Jesus Hernandez, University of Florida, College of Education, Gainesville

52 Supporting Novice Teachers to Acknowledge Students' Mathematical Competencies

 Coaches/Leaders/Teacher Educators Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

This presentation focuses on an instructional strategy to celebrate students' assets: acknowledging students' mathematical competencies. Building on previous work in the field, we will share our efforts in supporting novice teachers to notice a multitude of mathematical strengths and to name those strengths in ways that are understandable to students. We will share a tool we've used with preservice teachers, as well as sample responses. Successes and ongoing challenges will be discussed.

Rosalie DeFino, University of Wisconsin - La Crosse

Michele Cudd, Morehead State University, Kentucky

53 Fostering Joy and Inspiring Connections

 6-8 Session

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Introduction to the Topic

How can we foster all students' mathematical agency, belonging, and joy? THIS is how we did it. Two years ago, our team implemented a re-imagined math curriculum designed to foster belonging, celebrate students' backgrounds, generate discourse, and shift mindsets. Intentionally placed tasks and routines helped us sustain our commitment to agency and belonging. It was hard work. We revised often. Along the way, we rediscovered our joy for teaching. We would love to share our story with you.

Jocelyn Dunnack, CPM Educational Program, Elk Grove, California

Twitter: @JocelynDunnack

Christine Mitchell, Benicia Unified School District, California

54 From Foundations to Flourishing: Find Joy in Understanding Multiplication and Division Progressions

3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Participants will explore a pedagogical approach centered on the Concrete-Representational-Abstract (CRA) learning progression. In this hands-on session, participants will experience firsthand how to bring the joy of learning to their students while instilling a deep and lasting understanding of multiplication and division. Through a series of interactive activities, discussions, and collaborative exercises, participants will gain insight into the CRA approach and discover how it maximizes learning.

Haley Galyean, Tomball ISD, Texas

Twitter: @haley_galyean

55 Empowering Mathematical Identity

Coaches/Leaders/Teacher Educators Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Discover techniques to empower students to embrace their mathematical identities and take charge of their learning journey. Learn how to foster a growth mindset, enhance self-efficacy, and nurture agency. This session also delves into creating a classroom environment where every student feels valued, respected, and supported. Join us to explore strategies for cultivating a sense of belonging by emphasizing representation, cultural responsiveness, and open dialogue.

Julie Carwile, JS Coaching and Consulting, Owensboro, KY

Twitter: @2ChicksJS

Shannon Stone, JS Coaching and Consulting, Borden, Indiana

56 Creating a Culture of Problem Solving

8-10 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

This presentation will focus on essential skills teachers must have to promote problem solving among their students. These skills include problem selection, promoting collaboration, helping students work through frustration while engaging in productive struggle, and utilizing appropriate questions to ensure students progress toward the goal. Participants will experience these skills from the viewpoint of a student and then analyze them through the eyes of a teacher.

Laurel Yates, Rankin County School District, BRANDON, Mississippi

Ashton Winstead, Rankin County School District, Flowood, Mississippi

57 Transforming Perspectives on Mathematics: A Methodical Approach to Elevating Instructional Practice

Coaches/Leaders/Teacher Educators Session

Session Content Level - Introduction to the Topic

Sometimes, the things we use for teaching don't give us the results we want. In this workshop, we will show you how to work collaboratively as a professional learning community to make changes that work. We will give your team clear steps to try a new math idea, check if it's working well, and adjust it to improve teaching over time. This session challenges the "one and done" approach to coaching and professional learning and seeks to elevate instructional practice.

Shannon Stone, Two Chicks and Arithmetic, Borden, Indiana

Twitter: @DrShannonStone

Julie Carwile, JS Coaching and Consulting, ,

58 Class Talks, Riddles, and Games to Increase Engagement in Number Bonds and Multiplication

Pre-K-2 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

We can enhance math engagement with authentic questions connected with everyday life instead of using rote memory algorithms without understanding why they work. Exposure to and using various approaches and representations can spark discourse and increase understanding. This is illustrated with the topics of number bonds and multiplication tables. Ready-to-use examples of projects, riddles, and games are presented.

Anneke Schreuder, Self employed and partially employed at Xavier Educational Academy, Katy, Texas

Twitter: @dyscalculiaserv

59 Understanding The Neuroscience of Math, Dyscalculia, and Effective Instruction for All

General Interest Session

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

How does math learning develop in our brains? Are we born with innate abilities to understand numbers, and if so, what are they? A primer on the neuroscience of math will help participants understand what our innate number systems are, how math understanding typically develops, and where dyscalculia occurs. An introduction to dot patterns will help participants see how to remediate the core deficit in dyscalculia and more effectively develop number sense for all.

Rebecca Lord, Lord Math Education LLC, Wilmington, Massachusetts

Twitter: @beckylordmath

60 Geometry is More Than Just Triangles and Squares: It's All About Reasoning

3-5 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Let's think about the development of geometric thinking in children. We'll look at a framework to help us better understand the development of geometric reasoning. We will also discuss some open-ended geometry tasks and how to use them to collect information about students' reasoning. We'll also talk about how the student thinking collected from these tasks can be used in lesson planning to individualize instruction better.

Thomas Fox, University of Houston Clear Lake, Texas

61 Translations and Scale Changes on Data Sets Using Technology: Effects on Descriptive Statistics

10-12 Session


Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Introduction to the Topic

We'll look at a classroom-ready exploration activity that asks students to make conjectures about what happens to basic, descriptive statistics under translations and scale changes. Technology (graphing calculator) connections will also be explored.


Thomas Fox, University of Houston Clear Lake, Texas

62 Cultivating Reflective Practice in Math Education: A Dual Perspective

 Coaches/Leaders/Teacher Educators Session
Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes
Session Content Level - Intermediate
This session delves into the essence of reflective practice for math educators, offering a dual perspective: how teachers can embody reflective practice and how they can instill the same in their students. We'll conclude by exploring the symbiotic relationship between formative feedback and reflective practice, emphasizing their combined potential to elevate math education.


Andrew Volk, Liberty University, Lynchburg, Virginia
Gail McGowan, Liberty University, Lynchburg, Virginia

63 Did Money Create Math? The Intertwined History of Math of Finance

 General Interest Session
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives
Session Content Level - Introduction to the Topic
Far from being created in ivory towers, many of the most important developments in mathematics arose as a response to practical financial problems. Despite this, applied math is often treated as intellectually second-best and presented in the classroom through artificial word problems. Learn about the interconnected history of math and finance, and how to show your students that 'real math' can be relevant and engaging.


Andrew Davidson, FiCycle, New York, New York
Philip Dituri, FiCycle / Dituri Consulting, BROOKLYN, New York
Jack Marley-Payne, FiCycle, New York, New York

64 Regression Leads to Progression!!

 10-12 Session
Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings
Session Content Level - Introduction to the Topic
Do your students struggle to make connections between different types of growth encountered while studying various functions? Come explore activities where students use technology and regression models to interpret real-world data. Regression types include linear, exponential, quadratic, and sinusoidal. Let regression inspire progress!


Scott Knapp, Glenbrook North High School, Northbrook, Illinois
Twitter: @scottknapp

65 Using Augmented Reality to Spark Engagement and Visualize Math

 General Interest Session
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives
Session Content Level - Introduction to the Topic
McGraw Hill and Verizon have partnered to create McGraw Hill AR, a free augmented reality app that's available across devices and languages to reach as many students as possible. We'll demo how augmented reality is leveraged with real world objects and interactive elements to create new opportunities for learning. From ski slopes to fireworks, from racing cars to desert islands, students can experience the fun in learning math, visualize abstract concepts, and see math in the world around them.


Virginia Whitehead, McGraw Hill, New York, New York
Rob Spierenburg, All Things Media, Mahwah, New Jersey

66 Writing for Learning, Metacognition, Problem-solving, Engagement and Social Justice in Math Class

 6-8 Session
Joy for Teachers and Students: Stories from the Classroom
Session Content Level - In-Depth
This session concerns the use of writing in middle school math class. Writing tasks can clarify students' thinking and facilitate mathematical discourse and metacognition. Different types of prompts will be presented that are tailored for different purposes: improving metacognition (thinking about thinking), encouraging problem solving, improving engagement of all students, and thinking about social justice. Examples from my own classroom will also be presented and discussed.


Joanne Ward, Taipei Adventist American School, Taiwan
Twitter: @JoanneWard

67 Assessing Beyond Right and Wrong Answers and Where to Go Next

 Coaches/Leaders/Teacher Educators Session
Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes
Session Content Level - Intermediate
Explore innovative, asset-based approaches to assessing students' strategies using developmental trajectories that not only guide in determining where students are in development but also how we can respond to students' strengths to support further growth. As we analyze student thinking with open-ended and two-pen assessments illuminating which big ideas and strategies students have constructed, we challenge traditional grading practices and begin supporting students from where they are.


Ryan Dent, Catherine Fosnot and Associates: New Perspectives, Vero Beach, Florida
Twitter: @cflm_math
Patty Tedford, Catherine Fosnot and Associates: New Perspectives, Vero Beach, Florida

68 Empowering the Next Generation With a Positive Math Identity

 General Interest Session
Rejoicing in the Assets and Identities of All Students
Session Content Level - Introduction to the Topic
Uncover the gap between modern demands for problem-solving, risk-taking, and collaboration and the current state of math classrooms fostering passive mimicry and memorization. Then, dive into strategies to empower every learner to develop a positive math identity in the ever-evolving math classroom community.

Mona Iehl, Mona Math, Chicago, Illinois

69 Dear Math, Let's Be Friends: How Preservice Teachers Describe Their Relationships With Math

 Coaches/Leaders/Teacher Educators Session
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives
Session Content Level - Introduction to the Topic
Although our relationship with math starts in infancy, the relationship changes once we start formal math instruction; it frequently sours for many and doesn't improve. This presentation focuses on how a group of early childhood preservice math teachers first described their relationship with math and then worked to improve their feelings towards math and their mathematical identity through activities designed to promote positive interactions with adults and young children.

Amber Beisly, University of Oklahoma, Tulsa

73 Professor Calculatron or: How I Learned to Stop Worrying and Love AI

 General Interest Session

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings
Session Content Level - Introduction to the Topic
Over the past year or so, OpenAI has been at the forefront of media outlets and educational discussions at schools across the country. During this session, we will discuss classroom-tested techniques to incorporate tools into the mathematics classroom that harness the power of AI without fear of this new technology replacing student thinking or the teacher. Uses of AI from both the student and teacher perspectives will be discussed and demonstrated.

Jonathan Engelman, Kettering College, Ohio

74 Creating Joy: Implementing Playful Opportunities in the Secondary Mathematics Classroom

 6-8 Session

Rejoicing in the Assets and Identities of All Students
Session Content Level - Introduction to the Topic
This presentation will express the need for joy in the secondary mathematics classroom, as well as ways of creating joy through the implementation of playful opportunities. I will share the characteristics of play, as presented by Brown (2010), and how these characteristics may occur in the mathematics classroom. This session will target opportunities that work to develop a flexible conceptual understanding, a productive mathematical disposition, and strategic competence among our students.

Mandy Howell, University of Oklahoma, Norman

75 Share Your Joy in Teaching and Learning Mathematics: Write for MTLT

 General Interest Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students
Session Content Level - Introduction to the Topic
How do you bring joy to your classroom? Do you have success stories to share? NCTM's newest journal, MTLT, offers a space for sharing your ideas with other teachers. In this session, we will provide an overview of MTLT, along with insights and strategies for writing an article. This session has the information you need to start sharing your classroom stories of joy. So, join us!

Angela Barlow, University of Central Arkansas, Conway

76 ACE Your classes With Activities, Coding, and Engagement

 General Interest Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

What you choose to do in the classroom can drive your students' engagement. By using activities and coding concepts, you can bring student participation and learning to life.

Lauren Carr, Villa Joseph Marie High School, Philadelphia, Pennsylvania
Twitter: @Laurcarr1313

77 Structuring Participation and Implementing Tasks to Create Joyful Moments for English Learners

 6-8 Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

Through initial structuring of student participation and designing tasks that center student curiosity, we found that we could create opportunities for moments of joy, comfort, and success in mathematics for English learners (ELs). In this presentation, we will share findings from our analysis of three trials with 35 middle-grade ELs and how to establish these classroom structures and lead activities to enhance instruction--and joy!--for ELs.

Jill Neumayer DePiper, WestEd, East Falmouth, Massachusetts
Guillermo Lopez, WestEd, San Francisco, California

78 Dancing with Fibonacci,... and Pingala, Virahanka, and Hemachandra!

 General Interest Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

1, 1, 2, 3, 5, 8, 13, 21,.....: Centuries before Fibonacci wrote about this sequence, artists and mathematicians in India investigated the way it lies hidden in numerical patterns in poetry, music, and dance. Participants learn about the history of the sequence, are challenged to solve the ancient arithmetical problems that generate it and create and explore short, fun rhythmic and movement sequences that embody it. Extensions connect with numerical rhythmic patterns from many world cultures.

Karl Schaffer, MoveSpeakSpin, Scotts Valley, California

79 Equitable Mathematical Modeling Online Resources: Fostering Equity and Interaction Among Students

 General Interest Session

Session Content Level - In-Depth

During this session, you will have the opportunity to delve into a collection of free online resources designed to foster equitable mathematical modeling. These resources have been created with students, teachers, and other collaborators to promote fairness and inclusive learning. By the end of this session, you will walk away with a deeper understanding of students' diverse mathematical ideas and uncover the potential of these resources to empower students and other educators.

Hyunyi Jung, University of Florida, Gainesville

Corey Brady, Southern Methodist University, Dallas, Texas

Jesus Hernandez, University of Florida, College of Education, Gainesville

Kayla Sutcliffe, University of Florida, Gainesville

Chonika Coleman-King, University of Florida, Gainesville

85 Finding Joy in Visuals: Gain a Deep Understanding of Fractions and Equations by Taking a New Perspective

 6-8 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

How can you fill gaps in understanding, building number sense, and accelerating learning at the same time? Is it possible to reengage students in conceptual understanding of fractions while teaching equations? How do you build procedural fluency from conceptual understanding? Put the joy back into fraction and equation teaching and learning by coupling visual and symbolic representations. Harness the power of visuals and experience the joy of "seeing it" to empower all your students to do the same.

David Mattoon, Hemet USD, Temecula, California

89 Student-Led Data Digs and Asset-Based Feedback: Small Successes Build Great Confidence!

 General Interest Session

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - In-Depth

The contents of this session will highlight how student-led data analysis and asset-based feedback foster a sense of ownership and empowerment in students. Participants will be able to explore how teachers and students use standards-based data tracking approaches to navigate the next steps following formative and summative assessments. Hear the small success stories that crescendo into a grand outlook on mathematics and a towering confidence to tackle rigorous real-world problems.

Peter-Gay Ferguson, Elizabeth City Pasquotank Public Schools (ECPPS), North Carolina

Twitter: @nvisionugreater

Stafford Ellis, Elizabeth City Pasquotank Public Schools (ECPPS), North Carolina

90 Math Identity and Joy: Geometry's Real-World Impact

 8-10 Session

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Intermediate

How do students' everyday experiences inform their approach to math, and how does your classroom leverage their diverse problem-solving resources? This session will showcase authentic assessments in a Geometry course designed to foster all students' positive mathematical identity, belonging, and joy. Participants will see examples of student work, learn about the implementation of each project, and hear reflections from the teacher.

Marjorie Hahn, Stanford University, California

mhahn3@stanford.edu

91 Three Strategies to Balance Social and Math Goals in Social Justice Mathematics Lessons

 6-8 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

You will learn three strategies to balance social justice goals with mathematics goals while implementing off-the-shelf social justice mathematics lessons. We observed and analyzed nine teachers' enactment of 13 social justice mathematics lessons. We will share common challenges we observed and strategies that can be used to maintain rigorous and conceptual mathematics. Teachers' use of these strategies creates opportunities to bolster students' engagement with Standards for Mathematical Practice.

Brent Jackson, WestEd, East Lansing, Michigan

Jill Neumayer DePiper, WestEd, East Falmouth, Massachusetts

Maria Saliccioli, WestEd, Washington, District of Columbia

92 Coaching Strategies for Fostering Student Choice in Mathematics Problem Solving

 Coaches/Leaders/Teacher Educators Session

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Instructional coaches and mentors will explore effective coaching techniques to assist teachers in promoting student agency and choice in their mathematics learning. The focus will be on leveraging students' strengths, providing differentiated support, and cultivating a classroom environment that encourages curiosity-driven instruction. Coaches will gain insights into guiding teachers toward creating an engaging and empowering mathematics learning experience for their students.

Hollie Hartford, AIE Connect, Westfield, New Jersey

Twitter: @AIEConnect

Susanne Langford, HMH, Boston, Massachusetts

93 What Do You Mean, Solve the Equation? Solving Equations Using Graphing Technology and Tables

 6-8 Session

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

Middle school students are taught "how to" solve an equation. Using a graphing tool to graph each side of the equation, students can see the application of solving equations as they see a point of intersection if one exists. Looking at tables, they will see a pattern where the values increase or decrease and approach the expected value. By introducing students to viewing equations graphically, you are giving them an early introduction to graphing linear equations and systems.

Mary Brese, Brink Junior High School, Oklahoma City, Oklahoma

Twitter: @OUMathdoctor


94 Histematics: Using History to Teach Mathematics

 Coaches/Leaders/Teacher Educators Session
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic
This presentation will show in detail how to use historical figures such as Malcolm X to aid in fostering conceptual and procedural awareness of different mathematical processes such as, but not limited to, multiplying fractions, solving proportional equations, finding derivatives, etc. This practice is part and parcel of Histematics, a culturally responsive pedagogy framework I have been developing since 2019 and using regularly in my teaching practice with demonstrated success.

Akil Parker, All This Math, LLC, Philadelphia, Pennsylvania

95 Improving Agency Through Math Argumentation for Cognitively and Linguistically Diverse Students

 6-8 Session
Rejoicing in the Assets and Identities of All Students
Session Content Level - Introduction to the Topic

This presentation discusses how our four-part model of math argumentation (generating cases, conjecturing, justifying, and concluding) is integrated with a three-part teacher-coach discourse approach where teachers identify and scaffold students' varying math strengths, interests, and learning differences. We highlight the successes and challenges of this model, examining how it improved math agency in middle school math classrooms among cognitively and linguistically diverse students.

Christina Silva, TERC, Cambridge, Massachusetts


Anushree Bopardikar, TERC, Cambridge, Massachusetts

Harriette Stevens, Mathematics Education Group, San Francisco, California

Teresa Lara-Meloy, TERC, Cambridge, Massachusetts

Jennifer Knudsen, TERC, Cambridge, Massachusetts

96 Highlighting Mathematics in a STEAM Context With Codable Robotics

 Coaches/Leaders/Teacher Educators Session
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate
STEAM is trendy, but how do you deepen mathematical understanding within integrated contexts? Model a STEAM activity tailored for elementary students and unpack mathematical connections. Attendees will collaboratively design a science-themed path and assist in programming a Dash bot to guide a tour of the path. At each stop, the bot will announce the distance traveled and the importance of the stop. Explicit connections to measurement, fractions, and computational thinking will be emphasized.

Amanda Thomas, University of Nebraska-Lincoln

Katie Johnson, University of Nebraska, Lincoln

Minji Jeon, University of Nebraska, Lincoln

Deepika Menon, University of Nebraska, Lincoln

Ursula Nguyen, University of Nebraska, Lincoln

98 Actively Explore Sequences and Series With Technology

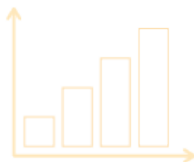
 10-12 Session
Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Introduction to the Topic
Exploring sequences and series through visualization helps students solve problems in context and make connections throughout their mathematics careers. In this session, we will discretely explore and discuss the finite and the infinite by using technology to represent sequences and series numerically, algebraically, and graphically in dynamic ways.

Kimberley Thomas, Moon Valley High School, Glendale Union High School District, Peoria, Arizona

Twitter: @Kim_Math

Veronica Carlson, Retired, Glendale, Arizona



Wednesday, April, 10

LIVE Presentations

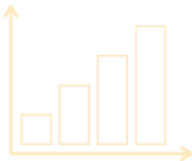
1 Opening Session: Punished for Dreaming: The Case for Abolitionist Teaching and Educational Reparations

LIVE | General Interest Session | 5:30 p.m.–7:00 p.m.(ET)

Dr. Love tells the story of her generation, the Hip Hop generation – children of the '80s and '90s – who came of age when mass incarceration and educational policies put unmistakable, identical targets on the backs of Black children. Crime reform and education reform merged to label Black children as crack babies, Super Predators, and thugs and told the nation they were nothing more than an achievement gap. Dr. Love's presentation vividly explains how the last four decades of educational reform laid the foundation for each book ban, CRT ban, and the never-ending goal of reformers to extract from Black education for their own gain. Her talk will end with a road map for repair and arguing for educational reparations with transformation for all children at its core.

Dr. Bettina Love

Author; Teachers College, Columbia University, New York, New York



Thursday, April, 11

EXHIBITOR Workshops

EW1 From Problems to Proficiency: A Project-Based Learning Experience in Algebra

LIVE | 8 to 10 Exhibitor Workshop | 10:00 a.m.–11:00 a.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

Learn to integrate project and problem-based learning with real-world Algebra applications, transforming classroom engagement and enhancing student proficiency.

Project Lead the Way, Indianapolis, Indiana

EW1.1 Enhancing Learning Through Thinking Tasks with Derivita

LIVE | Coaches/Leaders/Teacher Educators Exhibitor Workshop

| 10:00 a.m.–11:00 a.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

In a typical one-hour lesson, 75-85% of students are non-thinking for the entirety of the lesson. The remaining 25-15% are considered "non-thinking" for the entirety of the lesson minus 8-12 minutes of that 1-hour time slot. It's time we change that! Participants will engage in the when, where, what, and how of increasing thinking time in their classrooms and lead by Sherri Abel, Sr. Manager of School Partnerships for Derivita, and former district math specialist and transformation coach.

Derivita Inc., Salt Lake City, Utah

EW2 Tumblemath - Online Collection of Math Story Books for K-6.

LIVE | Pre-K to 2 Exhibitor Workshop | 1:00 p.m.–2:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level Introduction to the Topic

Tumblemath is a collection of online story books that teach kids in k-6 about math concepts through digital story telling. The collection features books about simpler math concepts like addition and subtraction all the way to complex math subjects like finance or geometry for elementary grades. The collection also has free lesson plans and quizzes, 24/7 access to usage stats and free marketing material. No downloads or software is needed, just click and listen. Come join us to learn more!

Tumbleweed Press inc., Toronto, Ontario

LIVE Presentations

100 Building Number Sense With Subitizing

LIVE | 6-8 Session | 3:00 p.m.–4:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Pre-K-2 Session

Session Content Level - Introduction to the Topic

Dice, fingers, tallies, and ten frames! Proficient mathematicians are problem solvers who recognize multiple representations of numbers and work with quantities in flexible ways. Subitizing is a practice that builds number sense and is key to becoming a fluent mathematician at any grade level. Quick and easy games and activities will be shared to engage young learners in efficient, play-based experiences that will have your learners "seeing" numbers in no time!

Lindsey Herlehy, Illinois Mathematics and Science Academy, Aurora

Cassandra Armstrong, Illinois Mathematics and Science Academy, Aurora

101 Promoting Multiple Pathways of Engagement and Learning Using Serious Games

LIVE | 3-5 Session | 3:00 p.m.–4:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

Principles of Universal Design for Learning can embrace students' assets through problem solving in authentic and meaningful ways. In this session, we introduce a universally-designed serious game based on STEM careers called "Dream2B." Learn how the design features of the game support fraction learning, engagement, and joy!

Jessica Hunt, NC State University, Raleigh, North Carolina

Twitter: @teach_doc_jhbh

102 Building 3D Thinkers: Spatial Routines and Activities for Grades 6 - 8

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

LIVE | 6-8 Session | 3:00 p.m.–4:00 p.m.

Session Content Level - Introduction to the Topic

This session will focus on the research behind spatial thinking, its importance in mathematics education, and building spatial reasoning through routines and activities. By engaging in routines from 5th to 10th grade, participants will be able to understand the vertical alignment of Geometry content and the connections across grade levels. Research highlights how spatial thinking is vital to a student's success in many areas of mathematics and deserves greater attention in the classroom.
Chad Dorrell, Florida College, Temple Terrace

103 Using Algebra Tiles to Build Understanding of Expressions and Equations.

LIVE | 8-10 Session | 3:00 p.m.–4:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

In this session, participants practice a series of problems they can use with students to build conceptual understanding of simplifying algebraic expressions and solving equations. We begin with an introduction to Algebra tiles before using them to determine perimeter, combine like terms of algebraic expressions, compare expressions, and solve equations. Participants benefit from practicing the problems in teams while experiencing facilitating and questioning in a student-centered classroom.
Kathryn Williams, CPM Educational Program, Louisville, Kentucky
Twitter: @kwill518

104 Deploying Algebra in the Personal Finance World

LIVE | 10-12 Session | 3:00 p.m.–4:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

"When will I ever use this?" is confidently answered with "Every day of your financial future." Math becomes meaningful when students can see direct connections to their current and future lives, and there are fewer connections more meaningful than a solid grasp of banking, budgeting, credit management, and investing. With activities far beyond the superficial "calculate interest," you can build mathematical prowess and sound financial habits simultaneously.

Jessica Endlich, Next Gen Personal Finance, Palo Alto, California

105 Number Talks: Supporting Preservice Teachers' Math Reasoning, Identities, and Future Practices

LIVE | Coaches/Leaders/Teacher Educators Session | 3:00 p.m.–4:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Intermediate

Number Talks are a well-known math tool in K-12 schools, supporting students' mental computational reasoning and providing formative assessment opportunities for teachers. This session presents the positive impacts of integrating Number Talks into a teacher preparation program as a tool to support preservice teachers' math and pedagogical practices. Presenters will share how we sequenced Number Talk experiences across our program and how our preservice teachers responded to these experiences.

Amy Smith, Stetson University, DeLand, Florida

Mercedes Tichenor, Stetson University, DeLand, Florida

106 My Problematic Fave: A Guide for Revising Tasks With Harmful Contexts

LIVE | General Interest Session | 3:00 p.m.–4:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

In this presentation, we share the concept of the "problematic fave" task and how the cycle of revision can be used to revise this task to reduce harm. Participants will have a chance to consider their own problematic faves, how problematic faves (their own or others') could be revised, and engage with the cycle for revision.

Aubrey Neihaus, Wichita State University, Kansas

Crystal Kalinec-Craig, University of Texas – San Antonio

Priya Prasad, University of Texas – San Antonio

Marcy Wood, University of Arizona, Tucson

107 Mathematics Teaching and Learning Using Multicultural Children's Literature

LIVE | Pre-K-2 Session | 4:30 p.m.–5:30 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Intermediate

Young mathematicians experience joy in learning through children's literature. Join this presentation to broaden your understanding of the power of using children's literature to foster young learners' mathematics and multicultural learning opportunities. We will share research briefly, then extensively share examples, routines, and abundant free resources to support you in planning engaging mathematics learning using children's literature, whether you're starting anew or expanding existing plans.

Maria Franshaw, UW-Parkside, Kenosha, Wisconsin

Twitter: @mfranshawftk

108 Using Technology to Add Joy and Challenges in Teaching Mathematics to Your Students

LIVE | 3-5 Session | 4:30 p.m.–5:30 p.m.

Finding Joy When Taking Up Multiple Pathways:

Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

During the workshop, we will explore a variety of math apps that will enhance and add challenges to your math classes. We will explore how to challenge the strongest to the weakest student by adjusting the questions for your students. The apps are either from NCTM apps or free on different websites. The topics include geometry, logic, number theory, and cool ways of exploring computation. All the apps can be used on an iPad, Chromebook, or any computer.

Susan Weiss, Solomon Schechter Day School, Brookline, Massachusetts

109 Equitable Mathematical Modeling Tasks: Designing Community Inclusive Areas

LIVE | 6-8 Session | 4:30 p.m.–5:30 p.m.

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - Introduction to the Topic

In this presentation, participants will work in break-out rooms on equitable mathematical modeling tasks (EM2T). We will share sample tasks, including the Temporary Skate-Safe Area, which was designed to create a budget and a drawing design. Participants will be encouraged to reflect on how communities use mathematics to create a skate area, considering flow, equitable use, and community inclusiveness. This task exemplifies how EM2T can foster students' understanding of communities' well-being.

Jesus Hernandez, University of Florida, College of Education, Gainesville
jhernandezzavaleta@smu.edu

Hyunyi Jung, University of Florida, Gainesville

Corey Brady, Southern Methodist University, Dallas, Texas

Kayla Sutcliffe, University of Florida, Gainesville

110 Spreadsheets Can Engage Students in Dynamic Problem Solving

LIVE | 8-10 Session | 4:30 p.m.–5:30 p.m.

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Intermediate

What if we were to design math education anew today? What if we built it on the primary tool of business and industry – spreadsheets and not paper? What if we prepared students for their future, not our past? We would have them practice dynamic problem solving on spreadsheets by asking, "What if..." We would ensure that they become spreadsheet fluent – engaged, collaborative, and creative. We would build an equitable shared curriculum rich in fascinating data and imaginative problems.

Art Bardige, What if Math, Cambridge, Massachusetts

111 Learning to Communicate: Telling the Stories in Data

LIVE | 10-12 Session | 4:30 p.m.–5:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Communication is vital in the practice of statistics. However, little attention has been given to developing the skills necessary for effectively using written communication to tell the story in a set of data. Too often students bring a mathematical approach, using statistical summaries without connecting to the context. What are the characteristics of a good statistical story, and what strategies can help learners develop skills to communicate the results of a statistical analysis?

Gail Burrill, Michigan State University, Hales Corners, Wisconsin

112 I LOVE MATH: One-Cut Origami Activities

LIVE | Higher Education Session | 4:30 p.m.–5:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Would you like to explore the mathematics behind enjoyable one-cut origami activities? Come join our session to make origami hearts and letters with one straight cut. Also, you will learn how to actively engage students in making, explaining, exploring, and discovering desired figures, as well as promote their interest in and learning of mathematics using one-cut activities.

Yi-Yin (Winnie) Ko, Indiana State University, Terr Haute

Lauren Holden, Munster High School, Indiana

113 President Address: Increasing Opportunities for Students in Mathematics

LIVE | General Interest Session | 4:30 p.m.–5:30 p.m.

What policies, processes, and practices must be examined to increase student opportunities during and after PK-12 education? Let's identify the purposes of learning math, consider the existing structures and what changes should be made, examine how to equitably teach mathematics, and help our students see themselves as capable of learning mathematics.

Kevin Dykema, President, National Council of Teachers of Mathematics Reston, Virginia; Mattawan Middle School, Michigan

114 Playing with Math and Science in the Early Childhood Classroom

LIVE | Pre-K-2 Session | 6:00 p.m.–7:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Young learners are equipped with the curiosity and creativity to be successful mathematicians and scientists. In today's classrooms, strong foundational skills in STEM promote success for years to come. Through play, young students can subitize, sort, draw, identify patterns, and explore loose parts. Participants will actively take part in several activities highlighting each of these essential skills.

Cassandra Armstrong, Illinois Mathematics and Science Academy, Aurora

Lindsey Herlehy, Illinois Mathematics and Science Academy, Aurora

115 Making Rounding More Than a Song: Getting to the Place Value Understanding

LIVE | 3-5 Session | 6:00 p.m.–7:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

How did you learn to round numbers? A song or catchy phrase? Many strategies used to teach students to round numbers lead to surface-level success for some and leave other students without the ability to fluently round. How can we increase student access to this important topic and see greater success for all? Building a conceptual understanding of the foundations of place and value that support rounding will lead students to stronger procedural fluency with this often challenging skill.

Anne Berger, Hamilton County Educational Service Center, Cincinnati, Ohio

Twitter: @cincy_mathanne

Christina Sherman, Hamilton County Educational Service Center, Cincinnati, Ohio

116 Rigor, High Expectations, Data Science, and Fun

LIVE | 6-8 Session | 6:00 p.m.–6:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Students are seeking engaging learning experiences. Teachers are striving for high achievement. Both parties win when there is room for growth and failure in a loving yet rigorous learning environment. In this workshop, Dr. Pough will demonstrate how she finds success in her classroom and how these methods translate to her higher education classes.

Natalie Pough, Ron Clark Academy, Atlanta, Georgia

Twitter: @dr_pough

117 Creating Equitable Spaces to Effectively Engage Learners in Collaborative Mathematical Explorations

LIVE | 8-10 Session | 6:00 p.m.–7:00 p.m.

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - Introduction to the Topic

During this session, leveraging collaborative tools to highlight equitable teaching practices. The primary focus will be on catalyzing change through equitable teaching practices that showcase students' brilliance and create learning opportunities that support reasoning and sense-making of contexts that engage our students, schools, and communities.

Farshid Safi, University of Central Florida, Oviedo

Twitter: @FarshidSafi

Maral Karimi, University of Central Florida, Orlando

Jacqueline Karastamatis, University of Central Florida, Orlando

118 Preparing Students for Tomorrow: The Role of Interactive Dynamic Technology

LIVE | 10-12 Session | 6:00 p.m.–7:00 p.m.

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Intermediate

The increasing power of technology calls for rethinking what is important to learn in secondary mathematics, recognizing that much traditional content can be left to technology, and shifting the focus to understanding and interpreting mathematical results. This session discusses how to make this vision a reality, where we teach mathematics to prepare students for tomorrow, not for a world that no longer exists, highlighting how technology can build students' mathematical agency and identity.

Gail Burrill, Michigan State University, Hales Corners, Wisconsin

119 Get Curious! Everyday Assessment Strategies That Reveal Student Thinking

LIVE | Coaches/Leaders/Teacher Educators Session | 6:00 p.m.–7:00 p.m.

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - In-Depth

Get curious about student thinking! Dig in deeper! Observations, interviews, and student work samples complement your digital data and offer information that describes what students DO know. Learn three research-informed shifts you can make in your routine that can make assessment less stressful, more student-centered, and highly informative.

Kimberly Morrow Leong, The Math Learning Center, Fairfax, Virginia

Twitter: kmorrowleong

120 Practices for Implementing Social Justice Modeling: Environmental Justice and Fair Sharing

LIVE | General Interest Session | 6:00 p.m.–7:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - In-Depth

Come learn about ways you can connect mathematics to students' lived experiences and foster their mathematical agency through social-justice mathematical modeling. We will share several examples of modeling tasks and offer time for participants to consider issues that their students would find important. We will explore practices embedded in the modeling cycle that are useful across all mathematics instruction and share examples of student work so you can envision what your students can do!

Hyunyi Jung, University of Florida, Gainesville

Megan Wickstrom, Montana State University, Bozeman

Friday, April, 12

EXHIBITOR Workshops

EW3 From Problems to Proficiency: A Project-Based Learning Experience in Algebra

LIVE | 8 to 10 Exhibitor Workshop | 10:00 a.m.–11:00 a.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

Learn to integrate project and problem-based learning with real-world Algebra applications, transforming classroom engagement and enhancing student proficiency.

Project Lead The Way, Indianapolis, Indiana

LIVE Presentations

121 Beyond Vocabulary and Word Walls: Inclusive Math Language Development for Every Student

LIVE | Pre-K-2 Session | 3:00 p.m.–4:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Students develop language in tandem with sense making. However, many traditional approaches to mathematical language fail to acknowledge students' assets, which particularly impacts emerging multilingual students. We will share an approach that honors all language and supports each student in enriching mathematical language functions.

Emily Griffin, Amplify Desmos Math, Brooklyn, New York

Vanessa Olivares, Amplify Desmos Math, Brooklyn, New York

122 Engaging in Cultural Relevance AND Mathematical Content Through Upper Elementary Ethnomodeling Tasks

LIVE | 3-5 Session | 3:00 p.m.–4:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

During this session, participants engage in ethnomodeling tasks integrating art, culture, history, and mathematical modeling to share unseen stories. The tasks will focus on upper elementary mathematics content such as geometry and algebraic reasoning. A primary focus of the session will be on supporting students' mathematical learning AND identifying ways that such tasks foster and promote a sense of belonging for all students within mathematics classrooms.

Siddhi Desai, Fairleigh Dickinson University, Teaneck, New Jersey

Colin Bower, Fairleigh Dickinson University, Florham, New Jersey

Farshid Safi, University of Central Florida, Orlando

123 Math Metaphors: Windows Into Students' Mathematical Experiences

LIVE | 6-8 Session | 3:00 p.m.–4:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

What tales would your students tell about their mathematical experiences? Come learn about a task where students create metaphors to capture their experiences and how you can use the task to foster community and belonging. Participants will engage in the metaphor task and explore examples that illuminate aspects of students' identities, agency, emotions and affect. Participants will consider how they can leverage their findings from the task to inform classroom instruction and interactions.

Megan Wickstrom, Montana State University, Bozeman

Toni Amarel, Placer Union High School, Auburn, California

124 Travel the World Exploring Geometry – It's Not Just Points, Lines and Planes

LIVE | 8-10 Session | 3:00 p.m.–4:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

Travel the world with us as we explore rich mathematical collaborative tasks. Solve contextual geometry problems based on historically and geographically significant locations. These problems keep kids curious about mathematics and the world beyond the school building! See how we can help students experience joy in Geometry while collaborating in breakout rooms. Participants will walk away with tasks to bring into their classes immediately and brainstorm new ideas with their peers.

Jessica Thiel, CPM Educational Program, Port Washington, Wisconsin

Twitter: @jabarnett09

Erin Schneider, CPM Educational Program, Louisville, Kentucky

125 Algebraic Applications of Adult Finances: A Relevant, Engaging Course All High School Students Need

LIVE | 10-12 Session | 3:00 p.m.–4:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic

All students, as adults, will encounter the need to analyze and solve financial scenarios they encounter. This session investigates a core math course that helps motivate students with the algebra they will need as adults. Banking, credit, employment, income taxes, auto insurance, mortgages, and investing are covered using selected topics from algebra 2, precalculus, geometry, probability, statistics, trigonometry, and more. All topics are taught assuming an algebra 1 prerequisite only.

Robert Gerver, North Shore Schools (Retired), Kings Park, New York

126 Supporting Access and Inclusion for Students With Special Education Needs

LIVE | Coaches/Leaders/Teacher Educators Session | 3:00–4:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Join Elli and Jordan as they discuss their experiences collaborating with elementary educators in implementing High-Impact Instructional Practices into de-tracked math programming anchored in universal design, critical consciousness, and culturally responsive and relevant pedagogy. We will examine how a Building Thinking Classrooms framework, along with minilessons and deliberate practice, supports greater access to mathematical content and opportunities for student inclusion.

Jordan Rappaport, York Region District School Board, Thornhill, ONorthwest Territories

Twitter: @JRappaport27

Elli Weisdorf, York Region District School Board, Toronto

3:00 p.m.–4:00 p.m.

127 Benjamin Banneker Association: Creating a Sense of Belonging in the Mathematics

LIVE | General Interest Session | 3:00 p.m.–4:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

This discussion will focus on lesson design that will empower students and create a classroom culture where math resides in the student, not just the classroom. Attendees will learn how to create spaces where students are engaged in meaningful productive struggle through specific strategies and design elements for creating culturally relevant mathematics lessons.

Beatrice Moore-Luchin, Benjamin Banneker Association, Houston, Texas

Twitter: @BeaLuchin

Shelly Jones, Central Connecticut State University, New Britain

Pamela Seda, Seda educational Consulting, Stockbridge, Georgia

128 Preschool Math: Adding Families to the Equation Counts!

LIVE | Pre-K-2 Session | 4:30 p.m.–5:30 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Children's early experiences with mathematics, through everyday activities and interactions with caregivers such as doing puzzles, playing games, reading storybooks, and even cooking and sorting the laundry, can build a strong foundation for later mathematics understanding. In this presentation, focused on early childhood, participants will learn about the power of collaboration to create effective programs and resources for engaging teachers and families in playful math learning opportunities.

Jessica Young, EDC, Waltham, Massachusetts

Kristen Reed, EDC, Waltham, Massachusetts

Luz Maria Considine, Education Development Center, Waltham, Massachusetts

Shakesha Thompson, Education Development Center, Waltham, Massachusetts

129 Making Math Dynamic Through Student-Centered Instruction

LIVE | 3-5 Session | 4:30 p.m.–5:30 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Intermediate

This presentation will show dynamic ways of instructing students to access the standard using a student-centered model. The majority of the session will focus on meeting student needs of those with specific learning disabilities such as dyscalculia. We will explore using concrete models, pictorial representations, and algorithms in conjunction with one another to help students fully understand the conceptual piece behind symbolic representations.

Aubrey Durkin, Specific Learning Disability Support Project, Saint John, Indiana

130 Leveraging Multicultural Mathematics Tasks for Inclusive and Engaging Teaching

LIVE | 6-8 Session | 4:30 p.m.–5:30 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

In this session, we will discuss ethnomathematics and its benefits and introduce participants to a variety of multicultural mathematics resources.

We will also explore multicultural math tasks focusing on geometric concepts and facilitate conversations related to incorporating multicultural mathematics tasks (MMT) in the classroom (e.g., possible challenges incorporating MMT and using MMT in fostering students' critical thinking and problem solving)

Jerome Amedu, University of New Hampshire, Durham

Ruby Ellis, North Carolina State University, Raleigh

131 Technology Integration As a Vehicle for Catalyzing Change in Equitable Teaching of 6-12 Mathematics

LIVE | 8-10 Session | 4:30 p.m.–5:30 p.m.

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Intermediate

During this session, participants explore contextually based tasks leveraging technological tools to highlight equitable teaching practices. The primary focus will be on catalyzing change through equitable technology integration that showcases students' brilliance and creates learning opportunities that support reasoning and sense-making of relevant social contexts that impact our schools and communities.

Farshid Safi, University of Central Florida, Oviedo

Twitter: @FarshidSafi

Maral Karimi, University of Central Florida, Orlando

132 Examining Status as a Way to Support Student Mathematical Identity Development

LIVE | 10-12 Session | 4:30 p.m.–5:30 p.m.

Session Content Level - Introduction to the Topic

Perceived societal, social, and academic status impacts how students' ideas are taken up and elicited by their peers in mathematics classrooms. This presentation shares one strategy that supports teachers in reflecting on their status and offers suggestions for raising the status of students in their classrooms to support full membership in the mathematics learning community.

Ayanna Perry, Knowles Teacher Initiative, Moorestown Township, New Jersey

Rosiane Lesperance, Knowles Teacher Initiative, Moorestown Township, New Jersey

133 Equitable Teaching in Social Justice Math Addressing UN 2030 SDG: Navigating Emotional Dimensions

LIVE | Higher Education Session | 4:30 p.m.–5:30 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Intermediate

The study examines educators' affective pedagogical goals when using Social Justice Mathematics (SJM) to understand the objectives they set in their teaching practices. I investigate the interplay between educators and students when sensitive topics related to social justice are broached in the mathematics classroom. We will also explore how educators navigate and manage the range of emotional responses that students may exhibit during discussions about various forms of injustice within society.

Rose Mbewe, Purdue University, Lafayette, Indiana

134 Parents and Teachers Collaborate to Enhance Multilingual Children's Mathematics Learning Experiences

LIVE | General Interest Session | 4:30 p.m.–5:30 p.m.

Session Content Level - Introduction to the Topic

A parent and teacher will share their experience collaborating to enhance multilingual children's mathematics learning experiences. The presentation will include connections to the district mathematics curriculum and sharing artifacts from the implementation of tasks in a classroom, including those that build on community knowledge. This will provide insight into ways educators might engage with families and communities to enhance mathematics curriculum.

Maura Varley Gutierrez, University of Arizona, Tucson

Fany Salazar, University of Arizona, Tucson

135 The Difference Between Surfboards and Surfing: Finding Joy Through the Assessment Process!

LIVE | 10-12 Session | 6:00 p.m.–7:00 p.m.

Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes

Session Content Level - In-Depth

When mathematics teachers create and score common unit assessments, build shared understanding of each essential standard's intent, and require student action on assessment feedback, they build an improved equity in the student learning experience. High-quality common formative feedback processes, along with timely student action on the feedback, enhance rather than destroy a student's desire to learn and help them to seek joy in their mathematics journey and not merely a grade.

Timothy Kanold, Mathematics At Work, Lodi, California

Twitter: @tkanold

136.1 Making Problem Solving Routine for Greater Access, Opportunity, and Agency

LIVE | 3-5 Session | 6:00 p.m.–7:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

Teaching problem solving is hard. It is about helping students learn to make sense, think, and reason. Simply, problem solving is not a procedure. Problem solving is not delivered it is developed. And in this session, participants learn how to do just that through engaging daily problem solving routines. The outcome is students who develop agency and become doers of math. Classroom-ready resources will be shared.

John SanGiovanni, Howard County Public School System, Westminster, Maryland

Twitter: @JohnSanGiovanni

137 Big Beautiful Problems - Experience the Joy!

LIVE | 6-8 Session | 6:00 p.m.–7:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

When was the last time you got to experience joyful math as a learner instead of as a teacher? When was the last time you got caught up in the challenge, excitement, and flow of solving a big, beautiful problem? Let's deepen our skills, confidence, and joy as we explore some of our favorite math problems that are accessible and engaging. Let's ignite our passion and have some fun! We won't forget about your students; we'll leave you with a resource complete of problems to bring back to your class.

Alicia Burdess, Grande Prairie and District Catholic Schools, Alberta

Twitter: @BurdessAlicia

Jessie Shirley, Grande Prairie and District Catholic Schools, Alberta

138 Cultivating Joy in the Mathematics Classroom Through Belonging, Connection, and Reflection

LIVE | 8-10 Session | 6:00 p.m.–7:00 p.m.

Joy for Teachers and Students: Stories from the Classroom

Session Content Level - Intermediate

How can we cultivate more joyful experiences in math class? Using videos, pictures, and stories from real classrooms, let's explore concrete ways to build a sense of belonging among students, help students connect with others, and support students in reflecting on their learning. Leave this session with some ready-to-use strategies for cultivating more joyful math experiences!

Cicely Woodard

Springfield Public Schools (Missouri)-Kickapoo High School

Twitter: @cicely_woodard

139 Modeling and Solving Problems with GeoGebra

LIVE | 10-12 Session | 6:00 p.m.–7:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

We will illustrate how all learners can use GeoGebra as a strategic tool to gain insights into modeling and solving geometric problems. GeoGebra is a free software with multiple languages, giving access to all students regardless of language background. We will explore two classic problems: The buried treasure problem and the picnic or Viviani's problem. We will discuss and justify some of the conjectures suggested by GeoGebra via mathematical proof.

Jose Contreras, Ball State University, MUNCIE, Indiana

Armando Martinez-Cruz, CSU, Fullerton, California

140 Equity in Action: Exploring Social and Food Justice Through Mathematics Education

LIVE | Higher Education Session | 6:00 p.m.–7:00 p.m.

Session Content Level - In-Depth

This study delves into social justice within mathematics education, prioritizing equity. Guided by NCTM's Equity Principle, we address social and food justice gaps through mathematics, particularly pertinent for pre-service teachers. Employing culturally relevant and critical pedagogies, we amplify equity in historically marginalized students' mathematics learning. Our inquiry scrutinizes the interplay between food justice, access, power, and students' math-linked social justice engagement.

Abigail Erskine, Purdue University (West Lafayette, IN), Indiana

Hillary Omoze, Purdue University, West Lafayette, Indiana

141 Math in Our World: Elevating Student Identity Within Math Language Routines

LIVE | General Interest Session | 6:00 p.m.–7:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Engaging students in meaningful mathematics learning can be challenging, often causing them to disconnect from the mathematics classroom. In this interactive session, participants will join together to find real-world math around them. Then, we will discuss how to blend these found representations with the Math Language Routines to provide powerful opportunities for students to understand mathematical ideas by celebrating their diverse backgrounds and strengths.

Naomi Dupre-Edelman, Mount Holyoke College, South Hadley, Massachusetts

Twitter: NaomiEdelman

141.1 IGNITE

LIVE | General Interest Session | 7:05 p.m.–8:30 p.m.

Hear from nine mathematics educators as they are challenged to give a five-minute talk, using 20 slides that auto advance every 15 seconds whether they are ready or not! Zandra De Araujo will emcee this exciting event!

Zandra De Araujo, University of Florida's Lastinger Center for Learning

Kansas Cole, Moore Public Schools, Oklahoma

Siddhi Desai, Fairleigh Dickinson University, Hackensack, New Jersey

Daniel Edelen, Georgia State University, Atlanta, Georgia

Christa Jackson, Saint Louis University, Missouri

Linard McCloud, Oak Pointe Elementary School, Irmo, South Carolina

Allison Mudd, Tuscaloosa City Schools, Tuscaloosa, Alabama

Natalie Moon, Raytown School District, Missouri

Evan Taylor, Indianapolis Public Schools, Indiana

Sheunghyun Yeo, Daegu National University of Education, South Korea

Saturday, April, 13

LIVE Presentations

142 Moving Beyond Place Value. Exploring the Concept of Place Value Through Addition and Subtraction.

LIVE | Coaches/Leaders/Teacher Educators Session | 11:00 a.m.–12:00 p.m.
Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students
Session Content Level - Introduction to the Topic
Participants will experience ideas of exploring the concept of place value through teaching addition and subtraction conceptually. This presentation is through the lens of an interventionist, but the techniques shared can be used in a whole class setting. Participants will explore the settings of bundles and sticks, dot strips, and the rekenrek. A progression of teaching will be shared.
Kristie Manley, Jefferson County Public Schools, Louisville, Kentucky
Twitter: @kmanley0628

143 A Data-Based Approach to Developing and Using Learning Menus With Mathematics Students

LIVE | 3-5 Session | 11:00 a.m.–12:00 p.m.
Finding Joy and a Sense of Belonging through the Analysis and Reflection of Student Assessment Outcomes
Session Content Level - Intermediate
This session will present a systematic approach to collecting, organizing, and analyzing data from students' work on learning menus. Through this work, teachers can better understand their students' thinking and gain insights for refining menu options to optimize differentiation principles and the quality of student responses. Session participants will consider sample menus and data sets to practice and reflect upon this approach and how it might be applied to their practices.
Kyle Schultz, University of Mary Washington, Fredericksburg, Virginia

144 Making it Personal: Activities to Inspire Agents of Change in the Battle Against Single-Use Plastics

LIVE | 6-8 Session | 11:00 a.m.–12:00 p.m.
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives
Session Content Level - Introduction to the Topic
Looking for a way to get middle school students excited about math AND science? Learn how we turned a real-world issue (plastic pollution) into a series of engaging and hands-on STEM activities. We will share insights from our implementation of these activities as well as tips for creating lessons that integrate concepts from math and science.
Ming Tomayko, Towson University, Maryland
Twitter: @ming_tomayko
Jordan Almony, Towson University, Maryland

145 Secondary Strings: Putting Thinking Classrooms into Action

LIVE | 8-10 Session | 11:00 a.m.–12:00 p.m.
Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives
Session Content Level - Introduction to the Topic
Many teachers have aspired to create Thinking Classrooms to support deep student learning. One of the key elements of Thinking Classrooms is to create lessons that feature "upwards thinking," where lessons begin with problems that highlight central ideas, and techniques are built on student work on these problems. This session will introduce participants to strings, a lesson structure from elementary schools, and learn how to use this structure to utilize upwards thinking.
Lindsay Freedman, West Deptford High School, New Jersey
Robert Wieman, Rowan University, Glassboro, New Jersey

146 Engaging Students in Conjecture-Related Activities Through Using Technology (GeoGebra)

LIVE | 10-12 Session | 11:00 a.m.–12:00 p.m.
Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings
Session Content Level - Intermediate
According to "Catalyzing Change in High School Mathematics" (2018), formulating conjectures constitutes a crucial phase within the mathematical proof process. Students are required to employ inductive reasoning to develop statements known as conjectures. An essential aspect of aiding students in initiating the conjecture construction process involves the visual exploration of ideas. This session focuses on using GeoGebra applets to enhance students' inductive reasoning in making conjectures.
Shahabeddin Abbaspour Tazehkand, University of Central Florida, Orlando
Maral Karimi, University of Central Florida, Orlando
Farshid Safi, University of Central Florida, Orlando

147 Promoting Equitable Mathematics in the Elementary Classroom Using a Community Focused Approach

LIVE | Coaches/Leaders/Teacher Educators Session | 11:00 a.m.–12:00 p.m.
Session Content Level - Introduction to the Topic
In this presentation, teachers will be shown strategies and instructional practices that promote a sense of belonging in students by incorporating student community and culture. Teachers in this session will be provided with techniques that help in dealing with the political and societal pressures plaguing teacher decision-making in the classroom.
Eugene Glover, Fulton County Schools, Union City, Georgia
Twitter: @EugeneTGloverJr

148 Joyfully Build Student Identity in Math by Using Structure to Make Connections That Make Math Stick

LIVE | General Interest Session | 11:00 a.m.–12:00 p.m.

Rejoicing in the Assets and Identities of All Students
Session Content Level - Introduction to the Topic
Leverage multiple representations to increase cognitive demand & provide multiple access points to challenging content. Students develop agency, authority & identity as they joyfully look for and use structure to express the connections they find between the representations. Achieve real-time formative assessment. Experience it as a learner before creating your own to use in your next lesson. Build procedural fluency from conceptual understanding & make math stick!

David Mattoon, Hemet USD, California

149 Geometry for Young Children: Learn While Playing With Interesting and Engaging Pattern Block Puzzles

LIVE | Pre-K-2 Session | 12:30 p.m.–1:30 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Introduction to the Topic
In this presentation, I will share the results of my experiences and research using pattern block puzzles with young children. Results of the research and my experiences indicate that making this activity available to young children is a way teachers can stimulate children's engagement in geometric/spatial reasoning and meet the NCTM standards for children PreK through 2nd grade. Data were obtained from a pretest and posttest assessment & Piaget's (1975/1985) theory of knowledge and intelligence.

Christina Sales, retired, Waterloo, Iowa

150 Walking the Number Line: Supporting Functional Thinking in Elementary School

LIVE | 3-5 Session | 12:30 p.m.–1:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic
Functional thinking involves understanding, reasoning, and describing how quantities relate. Although functional thinking is an important element of mathematical learning, it is rarely addressed in elementary school curricula. We present a novel, joyful, research-based activity developed in the Netherlands to engage and support the functional thinking of elementary school students.

Madhuvanti Anantharajan, Hogeschool IPABO, Delft, Netherlands

Mara Otten, Hogeschool IPABO, Amsterdam

Michiel Veldhuis, Hogeschool IPABO, Amsterdam

Bartjan Vollmuller, Hogeschool IPABO, Amsterdam

151 Spotlight on the Arts in Middle School Mathematics Classrooms

LIVE | 6-8 Session | 12:30 p.m.–1:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic
Using arts integration as the catalyst to increase mathematics enjoyment, students are provided opportunities to learn and immerse themselves in the content, increasing their confidence. This session will explore math anxiety in a middle school classroom and how an arts integration curriculum can help students rediscover the creativity and joy in mathematics.

Rachel Rudner, Saint Mark's Episcopal School, Fort Lauderdale, Florida

152 Menu Math: A Seven Course Meal for Teaching Algebra

LIVE | 8-10 Session | 12:30 p.m.–1:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

This seven-course meal provides all the nutrition necessary for students, young and old, to grow strong and healthy algebraic brains. This sensible approach helps all students prepare for algebra by taming concepts such as variable, substitution, algebraic properties, equation solving, and systems of equations. Classroom-tested and proven to be a practical approach to teaching algebraic reasoning and skills.

Brad Fulton, Enterprise Elementary School District, Millville, California

153 Using Data and Modeling to Take a Deep-Dive Into the Patterns of Daylight

LIVE | 10-12 Session | 12:30 p.m.–1:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Mathematical modeling is a tool for students to help make sense of the world around us. In this session, participants will collaborate on an engaging, real-world activity with multiple entry points and extended opportunities. Through data collection and modeling, mathematics 'sheds light' on patterns of daylight experienced throughout the world.

Scott Knapp, Glenbrook North High School, Northbrook, Illinois

Twitter: @scottknapp

154 Measuring Implementation: Moving From Fidelity to Integrity

LIVE | Coaches/Leaders/Teacher Educators Session | 12:30 p.m.–1:30 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

The purpose of this interactive session is to discuss how a contingency framework (Ebrahim, 2019) can help teachers and leaders better measure a math curriculum implementation. Participants will discuss the difference between implementation fidelity and integrity, and learn strategies for how to leverage implementation integrity rubrics to improve feedback, coaching, and professional learning.

Shelby Danks, Arken Research, Layton, Utah

155 Helping Students Make Sense Without Taking Over

LIVE | 6-8 Session | 12:30 p.m.–1:30 p.m.

Session Content Level - Intermediate

The Mathematical Practices are the behaviors students must engage in to become mathematically proficient. However, many teachers lower their expectations for students who quickly give up when they try to solve word problems. This is especially true for students who have internalized negative stereotypes about who is and isn't mathematically smart. In this session, participants will learn how to use a tool to help students make sense of problems and persevere in solving them.

Pamela Seda, Seda Educational Consulting, LLC, Stockbridge, Georgia

Twitter: @pamseda1

157 Making Space for Joy: Supporting Access to Mathematics Through Picturebook Biographies

LIVE | 3-5 Session | 2:00 p.m.–3:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Joy is a beautiful gift available to us, yet it seems elusive. We cannot make joy for ourselves or others, including our students. We can, however, make space in our lives and mathematics classrooms for joy to enter and abide, creating environments that can transform teaching and learning. This session presents the use of picture book biographies in creating space for joy as we employ the language arts to support access to mathematics.

Eula Monroe, Brigham Young University (Emerita), Jackson, Wyoming
Beverly Boulware, Middle Tennessee State University, Murfreesboro

158 Unlocking LCM and GCD Exploration with AI: Your Khanmigo Learning Companion

LIVE | 6-8 Session | 2:00 p.m.–3:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Intermediate

This session shares the ways for learners to engage with AI in a meaningful way to cater to rich mathematical discourse while unpacking LCM and GCD concepts. When used effectively and purposefully, AI could leverage meaningful mathematical engagement for students and teachers. Examples of successful use of the AI-Powered Learning Guide Khanmigo will be shared.

Zuhal Yilmaz, Louisiana State University, Baton Rouge
Nirmala Naresh, University of North Texas, Denton
Sinan Kanbir, University of Wisconsin Stevens Point
Terrie Galanti, University of North Florida, Jacksonville
Iris Johnson, Independent Researcher, Shreveport, Louisiana

2:00 p.m.–3:00 p.m.

159 Pattern Pursuit! Investigating Patterns with Technology

LIVE | 8-10 Session | 2:00 p.m.–3:00 p.m.

Discovering Joy through Deep Mathematical Understanding Inspired by New Perspectives

Session Content Level - Introduction to the Topic

Use your computer or calculator to investigate patterns numerically, graphically, and algebraically, and create linear, quadratic, and exponential models. Share the joy of discovering multiple ways of thinking about a problem. Try some numerical explorations supporting common algebra rules such as exponent and log laws. Investigate some unexpected surprises using fractions, radicals, and imaginary numbers!

Karen Campe, Independent Consultant, New Canaan, Connecticut
Twitter: @KarenCampe

160 Activating Agency for Emerging Multilingual Learners

LIVE | 10-12 Session | 2:00 p.m.–3:00 p.m.

Finding Joy When Taking Up Multiple Pathways: Enhancing Instruction for All Students

Session Content Level - Intermediate

How do students enter a math task when they are not proficient in the language? Mathematical Language Routines (MLRs) develop language and mathematical understanding while fostering agency. This session will provide an opportunity to experience mathematics with MLRs, productively struggle, and reflect on strategies used to position Emerging Multilingual Learners to experience the joy and beauty of mathematics.

Astrida Lizins, CPM Educational Program, Honey Brook, Pennsylvania
Rhonda Pierre, CPM Educational Program, Elk Grove, California

161 Using Video Recording Tools and Discussions with Your Coach to Transform Your Practice

LIVE | Coaches/Leaders/Teacher Educators Session | 2:00 p.m.–3:00 p.m.

Beyond School Walls: Teaching & Learning of Mathematics in Multiple Settings

Session Content Level - Intermediate

How do math teachers and their coaches use classroom recording tools to plan, implement, and reflect on ways to engage middle schoolers in deep and joyful mathematical conversations? Participants will learn how math teachers and coaches from five districts used the Visualize Teaching model of teacher-coach professional learning to build strong math argumentation communities. Participants will do math together, examine videos of the teacher-coach dyads, and leave with discussion guides and agendas.

Teresa Lara-Meloy, TERC, Oakland, California
Jennifer Knudsen, TERC, Austin, Texas
Harriette Stevens, Mathematics Education Group, San Francisco, California
Ken Rafanan, TERC, San Antonio, Texas

162 Foster Math Identity Through Authentic Financial Applications

LIVE | General Interest Session | 2:00 p.m.–3:00 p.m.

Rejoicing in the Assets and Identities of All Students

Session Content Level - Introduction to the Topic

Learn how to develop a positive student identity through authentic and responsive applications to personal finance. Though finance is a natural application of high school math and is relevant and engaging to students, it is often taught through a privileged lens that does not reflect students' experience. We present recent research on mathematical and financial identity, with lessons on being sensitive to students' context and showing them that they belong in math and finance.

Jack Marley-Payne, FiCycle, New York, New York
Philip Dituri, FiCycle / Dituri Consulting, BROOKLYN, New York
Andrew Davidson, FiCycle, New York, New York

163 Closing Session: The Surprising Importance of Early Math—for Everyone

LIVE | General Interest Session | 3:05 p.m.–4:30 p.m.

Learn about surprising research findings about early math, including its importance for present and future learning, children's potential for learning, -- especially children with disabilities (CWD) -- and what we know about effective teaching using asset-based learning trajectories. Takeaways include new supports for teaching and learning early math playfully and joyfully.

Douglas Clements, University of Denver, Colorado
Julie Sarama, University of Denver, Colorado

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