



## 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.