

2019 ANNUAL CONFERENCE



Friday, October 18, 2019 • Dundalk High School

Table of Contents

| MCTM Mission and Goals | 2 |
|---|----|
| Message from the President | 3 |
| 2018–2019 MCTM Board Members | 4 |
| MCTM Conference Committee Members | 5 |
| Plan Your Day | 6 |
| Conference Schedule | 8 |
| Speaker | 9 |
| MCTM Excellence In Teaching Award Winners | 10 |
| Sponsors and Exhibitors | 11 |
| Certificate of Attendance | 12 |
| Personal Planner | 13 |
| Schedule at a Glance | 14 |
| Sessions and Speakers | 16 |
| Sponsors Ads | 32 |
| Dundalk High School Map | 35 |
| Speaker Index (by Session Number) | 38 |
| Notes | 40 |

MCTM MISSION

The Maryland Council of Teachers of Mathematics is a public voice of mathematics education, inspiring vision, providing leadership, offering professional development, and supporting equitable mathematics learning of the highest quality for all students.

MCTM's GOALS

- **1.** To encourage an active interest in mathematics and its teaching, and to work toward the improvement of mathematics education programs in Maryland.
- 2. To facilitate the exchange of ideas and facts about current problems, techniques, and experimental programs in the teaching of mathematics by providing such resources as conferences, meetings, newsletter, journal, research studies, and information services.
- **3.** To encourage and assist other state and national organizations concerned with mathematics education at all levels.



Welcome to the 2019 Maryland Council of Teachers of Mathematics (MCTM) Annual Conference! This year's theme, What does your WHY equal? How does your passion translate?, is designed to provide you the opportunity to reflect on elements of your personal mission and vision that fuel your drive to help students in Maryland grow in their ability to be successful in math. We are excited for the many sessions, including our featured speakers, that will provide you the opportunity to grow personally and professionally in the areas of planning, assessment and engagement.

MCTM is so pleased to work collaboratively with the administration and staff of Dundalk High School and the Baltimore County Public Schools. We thank you for allowing us to continue partnering with Baltimore County for our conference and once again being generous hosts this year.

I would also like to take a moment to thank the conference committee, who volunteered to serve many hours this past year to make arrangements for today's conference. Please take a moment to review the list of math educators who collaborated with us in this program and thank them for their work as your paths cross during the day.

We are so grateful for the sponsors and exhibitors who are supporting us today. Their generous donations make our state conference possible and allow us to continue providing you professional development that is comparable with regional and national NCTM events. Please take time today to visit our exhibitors and learn about the resources and products they provide.

Finally, let me take a moment to thank you for choosing to attend the 2019 MCTM Annual Conference. We are a volunteer non-profit organization that aims to inspire vision, provide leadership, and offer professional learning opportunities for our members. We hope that you find today's conference valuable to your work in education. We will be offering more professional learning opportunities for our members across the state throughout the year, so be sure to visit www.marylandmathematics.org to stay apprised of what is next. We are also always looking for volunteers to serve on committees or to assist with events. If you are interested, please feel free to reach out to the Executive Board.

We hope you have a wonderful conference experience!

John Fontinell

John Fontinell

2018–2019 MCTM Board Members

Note: Elected members for 2019–2020 will be announced at the MCTM Annual Meeting and Banquet and begin their term October 18th.

| Executive Board | | | |
|--------------------------------------|--------------------|--|--|
| President | John Fontinell | | |
| President-Elect | Robin White | | |
| Executive Director | Leslie Johnson | | |
| Recording Secretary | Ming Tomayko | | |
| Treasurer | Peter Lo | | |
| Nominations/Elections Chair | Jenny Novak | | |
| Elected Positions | | | |
| Central Region Representative | Matthew Cox | | |
| Western Region Representative | Christine Therault | | |
| Southern Region Representative | Julie Taylor | | |
| Eastern Shore Representative | Vacant | | |
| Early Childhood Level Representative | Linda Schoenbrodt | | |
| Intermediate Level Representative | Michele Lerner | | |
| Middle Level Representative | Ashley Lancaster | | |
| High School Level Representative | Amy Goodman | | |
| Pre-Service Teacher Representative | Lilly Fontinell | | |
| Coaching Representative | Greta Richard | | |
| College Level Representative | Christy Graybeal | | |
| Government Relations Representative | Meredith Adams | | |
| Member-at-Large | Stacy Shaener | | |
| NCTM Liaison | Andrew Bleichfeld | | |
| Appointed Positions | 3 | | |
| 2019 Conference Chair | John Fontinell | | |
| Awards Chairperson | Damitra Newsome | | |
| Banner Editor-in-Chief | Christy Graybeal | | |
| Communications Chairperson | Alexandra Weyforth | | |
| MSDE Representative | Linda Schoenbrodt | | |
| Math Month Chairperson | Bonnie Kellner | | |
| Membership Chairperson | Soosan Faulk | | |
| New Teacher Resources | Holly Cheung | | |
| Nominations Chairperson | Jenny Novak | | |
| Webmaster | Meredith Adams | | |

MCTM Conference Committee Members

| Conference Chair | John Fontinell |
|-------------------------------|---|
| Awards | Damitra Newsome |
| Banquet | Peter Lo |
| Breakfast/Lunch | Laura Behrens and Liz Zinger |
| Corporate Sponsors/Exhibitors | Meredith Adams, Ashley Lancaster, Christine Thereault, and Matthew Cox |
| Equipment/Technology | Jeff Starr and Chris Wojcik |
| Registration | Leslie Johnson |
| Hospitality | Samantha Hendershot |
| NCTM Sales | Andrew Bleichfield |
| On-Site Coordinator | Sarah Atwood-Starkey |
| Pre-Service Teachers | Christy Graybeal |
| Program | Michele Lerner and Jenny Novak |
| Signs | Andrea Lang |
| Special Needs | Bonnie Kellner |
| Student Volunteers | Kevin Sams and Jomac Henderson |
| Accounting | Peter Lo |

Plan Your Day

Complimentary Breakfast

A complimentary continental breakfast will be available from 7:30 a.m. to 9:00 a.m. in the Cafeteria.

Lunch

Lunch will be available in the cafeteria from 11:15 a.m. to 1:00 p.m.

NCTM Materials

In the exhibit area, come browse publications and products from the National Council of Teachers of Mathematics. All conference attendees save 20% on all books, posters, and mathematics products. Visit nctm.org/store and use code MDCTM19 to receive a 20% discount and FREE shipping! This code will be valid from 10/18/2019–10/26/2019.

Room Capacity

Most rooms hold approximately 30 people. Fire code regulations prohibit over capacity.

First Aid

If a medical emergency occurs, report to the registration area.

Conference Registration

Please be sure to pick up your registration materials, complimentary bag, and name tag in the registration area outside of the gym.

Advance registration was offered on the website. All speakers and pre-registered participants should pick up conference packets at the registration tables.

On-site registration will begin at 7:30 a.m. in the registration area. On-site registration will be \$50.00.

Speaker Registration

All speakers should report to the speaker registration area upon arrival to check in and receive a name tag and registration materials. There will be student volunteers available to assist speakers with the transition to their rooms.

Speaker Hospitality Room

There is a hospitality room available for presenters. Information regarding location will be distributed at speaker check-in. Volunteers will be available throughout the day to provide general assistance and to answer questions.

Program Supplement

Be sure to check out the program supplement at the conference to see any last minute program changes!

Permission To Tape/Record

Permission to tape or record any session is at the discretion of the presenter(s). Please ask permission of the speaker prior to recording.

Special Services

There are handicapped parking spaces and accessible entrances at the school. Selected sessions throughout the day will be interpreted based on online registration request. A schedule of the interpreted sessions will be available at the Special Needs desk in the registration area. Other appropriate accommodations for individuals with disabilities may be provided upon request online.

Student Assistants

Students will be serving as hosts during the day of the conference. They will be available to help speakers and other conference attendees. Look for students wearing the MCTM conference t-shirts.

Raffle

A raffle will be held in the cafeteria immediately following the final session. Tickets will be distributed before the afternoon keynote address at the entrance to the cafeteria. The raffle will begin at 2:40 p.m. Educational products donated by the exhibitors will be raffled as well as additional prizes provided by MCTM. You must be present to win.

Carpooling

All carpooling participants will receive additional raffle tickets at the registration booth upon arrival. Do the math! This increases your chances of winning.

Conference Schedule

| 7:30 am - 9:00 am | Registration and Continental Breakfast |
|---------------------|--|
| 8:30 am - 9:00 am | Opening Session |
| 9:00 am - 10:00 am | Keynote Speaker Dr. Faith Muirhead |
| 10:15 am - 11:15 am | Session I Regular Sessions |
| 10:15 am - 11:45 am | Session II Extended Sessions |
| 11:15 am - 1:00 pm | Lunch/Exhibits |
| 12:15 pm - 12:45 pm | Session III Burst Sessions |
| 12:15 pm - 1:15 pm | Session IV Regular Sessions |
| 1:00 pm - 2:30 pm | Session V Extended Sessions |
| 1:30 pm - 2:30 pm | Session VI Regular Sessions |
| 2:40 pm - 3:00 pm | Closing and Raffle |



MCTM 2019 Annual Conference

Keynote Speaker

9:00 a.m. to 10:00 a.m. Auditorium

The Subtle Bigotry of Low Expectations

The language of schooling seems to dictate the ranking, comparing, and ordering of children. Phrases such as low level, high level, low kids, high kids, etc. are ubiquitous in school. This language creeps into teacher practice, into our questions, the tasks we choose, the language we use, the expectations we hold. This session will address issues of equity that result from careless language choices and how to bring this issue into specific relief.

Faith Muirhead, Ph.D.



Faith Muirhead, Ph.D., was formerly a secondary mathematics and physics teacher in NYC public schools who currently serves as the Senior Associate Director of the Professional Development Center for Educators and as an Assistant Professor at the University of Delaware. She has written professional development materials, taught for nearly two decades in both traditional and non-traditional teacher certification programs, worked as a mathematics coach, a coach for mentor teachers and coaches, and served as project director for the targeted MSPinNYC. She is immersed the coaching of both practicing and prospective teachers in the midst of teaching in order to

identify and explore how to improve teaching and learning. She is passionate about students and teachers working in high-need schools in urban and rural contexts, particularly from typically underrepresented groups.

MCTM Excellence In Teaching Award Winners

Congratulations 2019 Winners!

Beginning Teacher Award

Caroline Sneller

Bonnie Branch Middle School, Howard County Public Schools

Elementary Teacher Award

Lynsey Hayden

Dynard Elementary School, St. Mary's County Public Schools

Middle School Teacher Award

Rebecca Stryker

Patuxent Valley Middle School, Howard County Public Schools

High School Teacher Award

Kelly Rupprecht

Marriotts Ridge High School, Howard County Public Schools

Teacher Leader Award

Greta Richard

Harpers Choice Middle School and Wilde Lake Middle School, Howard County Public Schools

The Maryland Council of Teachers of Mathematics would like to thank our sponsors. Without their generous support, this event would not be possible.





Personal Planner

| Session | Time | 1 st Choice | 2 nd Choice |
|-----------------|---------------------|------------------------|------------------------|
| Exhibits | 8:00 am – 1:30 pm | | |
| Morning Keynote | 9:00 am – 10:00 am | | |
| I | 10:15 am – 11:15 am | | |
| Ш | 10:15 am – 11:45 am | | |
| III | 12:15 am – 12:45 pm | | |
| IV | 12:15 pm – 1:15 pm | | |
| v | 1:00 pm – 2:30 pm | | |
| VI | 1:30 pm – 2:30 pm | | |

Lunch available in the Cafeteria from 11:15 am to 1:00 pm. Raffle/Door Prizes in the Cafeteria at 2:40 pm.



What Does Your Why Equal? How Does Your Passion Translate?

Schedule at a Glance

Highlight Key

| ingingin key | | | | | | | |
|--|--|---|--|---|---|--------------------------------|--|
| Blue Exhibitor Showcase | Orange Leaders/Coaches/ Teacher Educators | Red Elementary | Gre Middle | Green Middle School College | | e pol/ | None Multiple Grade Bands |
| Session I Regular Sessions 10:15 – 11:15 | 8 Strengths- Based Teaching Turnarounds: | 16 Where's Financial Ris Breaking the Consistently | the k? | Ses Ex Se | sion II tended ssions | | Session III Burst Sessions 2:15 – 12:45 |
| 1 Math is Everywhere! How to Use Real World Examples & Apply | Leverage Your Students Strengths through Instructional Design (PreK-8) | Inconsistenty Informationa as it pertains Management | l Cycle s to Risk t and | 10:18 24 Bea 101 (Pre | 5 – 11:45 d Strings eK-5) | 33 Gra (Ge | Hood College's iduate Programs eneral Interest) |
| them in Your Math Classroom (General Interest) | 9 Fostering Curiosity about Volume Formulas (6-8) | Insurance St within Finance Literacy Curr | Insurance Standards within Financial Literacy Curricula | | ving aticians nber Lines | 34 Ga Ma | Technology and mes in Elementary thematics (3-5) |
| 1 Build More Resilient Kids by | 10 Multiplying | (6-12) 17 College | | (PreK-5, Exhibito | r Showcase) | 35 (3- | Jumping Circles 5) |
| Mindset (General Interest) | than Just a Rule! (3-5) | Preparatory Mathematics Exhibitor Sho | s (6-12, owcase) | 26 Rob the Math Classroo | otics in nematics om (6-12, | 36 tha (3- | Book Studies t Pack a Punch! 12) |
| 2 CoveRing the bAses: CRA Using Base Ten Blocks -Part 1 | 11 Let's Give Them Something to Talk About! -Building Mathematical | 18 Integration than area un curve (9-12) | on: More Ider a | Exhibito 27 Fun Solving! | r Showcase) with Problem (3-12) | 37 You Spa | Please Submit Ir Response in the ace Provided |
| (General Interest) 3 Communicating Understanding in Math | Language and Understanding Through Discussions (6-12, Leaders) | 19 Writing t encourage le in Mathemat (9-12) | o earning ics | 28 Arrê !! Using to Prome Engagen | ter de parler Protocols ote Student nent and | (6- 38 Pro Cel | 12) Building Better blem Solvers One I at a Time (9-12) |
| (General Interest) 4 Manipulatives | 12 Math Talks in the Secondary Classroom (6-12) | 20 Taxicab Geometry: Pl a Mathemati | 20 Taxicab Geometry: Playing in a Mathematical City | | se during on (6-8) | 39 Dea | Coaching Lab: aling with Difficult |
| as a Tool for Differentiation (PreK-5) | 13 Building Activities in Desmos Activity | (9-12) 21 Math So | up | Thinking (6-12) | МСАР | | Session IV |
| 5 Rethinking the School-Home | Builder, Part I (6-12) 14 Creating | (9-12) 22 Logarithr | ms: | 30 Explorations with Square, Triangular, | | Ke | gular Sessions 12:15 – 1:15 |
| Connection (PreK-5) 6 Solving Rigorous Math Tasks Using | Activities and Polygraphs in Desmos (6-12) | We Can Do E (9-12) 23 What ma | etter! | Pentago Figurate (6-12) | nal and other Numbers | 40 the Ide | The Impact of Mathematics ntity |
| a Team-Based Approach (PreK-5) | 15 OMG! ON for some MATH GROWTI (6-12) | DN for math coaching I GROWTH successful? Tales | ng Tales rch | 31 Fillin with Alge | ng the Gaps ebra Tiles | (Ge 41 | Using |
| 7 Making Math Matter: Using activities | | study on MQ Coaching (Le | l eaders) | (6-12) 32 Buil and Thin | ding Equity king In Math | lmı Thi (Ge | prove Student nking eneral Interest) |
| mathematics for all students (PreK-8) | | | | Classroo | oms (6-12) | 42 MC Ma | Introducing AP Grades 3-5 thematics (PreK-5) |

43 Successful Task Implementation (PreK-5)

44 I can show what I hear: Connecting music to mathematics (PreK-5)

45 Making the Most of Meaningful Models (PreK-5, Exhibitor Showcase)

46 Keeping It Real: Making Real-World Connections in the Math Classroom (K-5)

47 Build your Toolbox: Strategies to Promote Growth with Modeling and Reasoning (1-5)

48 CoveRing the bAses: CRA Using Base Ten Blocks -Part 2 (3-5, Leaders)

49 The Make 10! Challenge: Representing Operations to Understand the Order of Operations (3-8)

50 Coaching: A Relationship Building Approach (6-8, Leaders)

51 Empowering Teachers with Instructional Routines (6-12, Leaders) **52** Why Formative Assessment? (6-12)

53 The Number Line: A Deep Dive (6-12)

54 Looking For Zebras: Embracing Unexpected Solutions to Pattern Tasks (6-12)

55 Coding in Math Class! (6-12, Exhibitor Showcase)

56 Get Outta My Swamp! Shrek Helps Calculus Students Master Optimization (9-12)

57 Monopoly and Regression? (9-12)

58 Inverse Functions: A Lesson Study Across Three Classrooms (9-12)

Session V

Extended Sessions

1:00 - 2:30

59 Creating a Peer Coaching Collaborative in Your School (General Interest)

60 Math, Coding, and Programming... Oh My! Connecting Coding to the Standards for Mathematical Practice! (PreK-2) 61 Wait! Where are the Numbers? (PreK-5)

62 If Mathematics is a Universal Language, Why Do So Few Speak It? (3-8, Exhibitor Showcase)

63 Effective Questioning and Discussion Techniques (3-12)

64 Math 1-2-3 to X-Y-Z. Explore How One Strategy Builds a Cohesive Conceptual Structure Promoting Equity in the Classroom (3-12)

65 Shearing: Not Sheep but Shapes. Unpacking Geometry Coherence (6-8)

66 Reversing "I Do, We Do, You Do" with Technology (6-12)

67 Building Activities in Desmos, Part II (6-12)

68 Using Algebra Tiles ...From Polynomials to Completing the Square (6-12, Exhibitor Showcase)

69 Premeditation: A Thoughtful, Comprehensive Approach to Improving Students' MCAP Performance (9-12) **70** Logarithm Properties Jigsaw (9-12)

Session VI

Regular Sessions 1:30 – 2:30

71 Changing the Stigma that Math is "Hard" (General Interest)

72 Let's Dispel the Myths About Women and Mathematics (General Interest)

73 From Obscurity to Focus: One District's Journey in Bringing Clarity and Purpose to Data Dialogues (General Interest)

74 Planning and Teaching with ESOL in Mind (PreK-5)

75 Collaborative Planning Menu: A Resource Tool (PreK-5)

76 Beyond Explaining an Answer: Writing for a variety of purposes in the Mathematics Classroom (PreK-5)

77 Making Sense of Number Sense Routines (PreK-5)

78 Using Tiered Tasks to Foster Mathematical Proficiency in All Students (PreK-5) **79** AA4A (Algebra Access for All) (3-12)

80 Computer Science Computational Thinking in K-8 Classrooms (K-8)

81 Learning Mathematical Concepts Through Authentic Learning (6-12)

82 Connecting the Current Topics in Mathematics Education (6-12)

83 Basketball Functions: Engaging Students with Interactive Graphs (6-12)

84 Coding ... There IS Math Involved (6-12)

85 The Why and How of Integrating Data Centric Lessons into Your Classroom (9-12)

86 Keep Calm and Coach (Leaders)

87 Residency -It's Not Just for Doctors (Leaders)

Session I Regular Sessions 10:15 – 11:15 am

Build More Resilient Kids by Implementing Growth Mindset

General

Room 3109

Do your students give up too easily? Are they afraid to approach a challenge because they're worried they might not "look smart"? Hear how Growth Mindset has transformed one school into a place where "pedestal kids" have become "gritty kids."

Mark Minkus

Community Day School

2 CoveRing the bAses: CRA Using Base Ten Blocks, Part 1

General Interest

Room 3140

The base ten block is the most unappreciated manipulative that we all have. Join in this session to "play" with blocks to develop early estimation, addition, subtraction strategies. Learn new ways for using "snap" cubes to develop understanding and ways to move into using these gems to breathe new life into your math class and students' understanding through the CRA approach.

Ryan Amore

Charles County Public Schools

Communicating Understanding in Math

General Interest

Room 3145

This workshop will encourage student voice to deepen their mathematical understanding through exploration. Teachers will learn instructional and technology integration strategies to improve student critical thinking, writing, and communicating mathematical concepts to increase understanding and long term retention.

Chris McCaffrey

Wilson School District

4

Manipulatives as a Tool for Differentiation

PreK–5

Room 3116

Come explore how to use virtual manipulatives to help differentiate instruction in your class. Strategies will be shared to help students with disabilities and students working at different levels.

Kevin Dykema

Mattawan Consolidated Schools

5 Rethinking the School-Home Connection

PreK-5

Room 2181

Tips for creating and fostering a positive schoolhome connection concerning elementary math education. The session will address navigating around guardian math anxiety, strategies that don't always align with classroom instruction and how to build support and parent capacity for helping students at home. Alternatives to traditional homework structures will also be shared.

J. Megan Maletto Charles County Public Schools

MCTM 2019 Annual Conference

6 **Solving Rigorous Math Tasks Using a Team-Based Approach**

PreK-5

Room 3146

This session will help teachers choose rigorous tasks for all learners using a team-based structure. We will show the elements of a rigorous task and how to create a team structure using roles in order to engage students for a deeper understanding of mathematical concepts.

Casey Ament Megan Dooley

Charles County Public Schools

Making Math Matter: Using activities to humanize mathematics for all students.

PreK-8

Room 3106

In this session, participants will learn about innovative ways to engage all learners of mathematics through creating and administering interest surveys, matching curriculum to community, and giving students the tools to create success criteria for their individual learning style.

Taniesha Goulbourne Julie Rankin

Charles County Public Schools

Strengths-Based Teaching 8 **Turnarounds: Discover and** Leverage Your Students Strengths through Instructional Design

PreK-8

Room 3110

We have been traditionally taught to identify and remediate students' mathematical misconceptions and weaknesses. This session is about reframing students' mathematical learning opportunities by identifying students' strengths to develop powerful and strategic learning opportunities that capitalize on those strengths to build mathematical success.

Beth Kobett

Stevenson University

Fostering Curiosity about Volume Formulas

6-8

9

Room 2172

In this session we will share several ideas for fostering student curiosity about the formulas for volume of prisms, cylinders, pyramids, cones, and spheres. We will focus on the derivation of the formulas and connections amongst them.

Christy Graybeal Victoria Green

Hood College

Multiplying Fractions is More than Just a Rule!

3 - 5

Room 2182

Multiplying fractions needs to be taught conceptually not through a rule. Participants will compare mathematical representations vs strategies when multiplying fractions and apply both using manipulatives and visual models. Participants will have an opportunity to connect what they have learned and apply it to high quality tasks in context.

Kelly Healey Denise Bogart

Howard County Public School System

Let's Give Them Something to Talk About! Building Mathematical Language and Understanding Through Discussions

6–12. Leaders

Room 3118

Develop mathematical language routines through class discussions that help students build precision in developing and communicating ideas. Explore the use of Discussion Supports, Take Turns, and Critique, Correct, Clarify, and consider how you can use these strategies regularly in your math classroom.

AnnMarie Varlotta **Greta Richard**

Howard County Public School System

12 Math Talks in the Secondary Classroom

6–12

Room 2179

In this session, you will learn the what, how, and why of math talks. We will share resources to get you started using math talks in your classroom and explore discourse in the secondary classroom.

Salli Waraksa

Laura Potter

Baltimore County Public Schools

13 Building Activities in Desmos Activity Builder, Part I

6–12

Room 2180

Participants will develop comfort with the platform. They will determine how to utilize Desmos Activities in their classrooms, features of the calculator, and how to use the Calculator as an effective teaching tool in their classrooms.

Brett Parker Chris Wright

Baltimore County Public Schools

Creating Activities and Polygraphs in Desmos

6–12

Room 2186

Participants will learn how to create activities, polygraphs and card sorts in Desmos. Activities can be used to teach conceptually while polygraphs and card sorts can be used as assessment. Participants will need to bring their own laptop or tablet.

Todd Moyer

Towson University

5 OMG! ON for some MATH GROWTH

6–12

Room 3119

It is high time that we increase student scores and boost their confidence to aim for success. This session will offer some meaningful activities for our Math learners using a mixture of traditional and technology-related resources. Now is the time for students to fully contribute and be highly accountable for their own learning.

Janice Magauay

Charles Carroll Middle School

Mbulwa Musyoki Prince George's County Public Schools

6 Where's the Financial Risk? Breaking the Consistently Inconsistent Informational Cycle as it pertains to Risk Management and Insurance Standards within Financial Literacy Curricula.

6–12

Room 3121

If financial risk is an important aptitude to understand, then why aren't risk management standards within financial literacy curricula specifically focused on this competency? This session intends to help evolve, advance, and understand this question through new research and discussion.

Michael Ladick

Allegheny County Public Schools

College Preparatory Mathematics

6-12, Exhibitor Showcase

Room 3156

The purpose of this session is to expose you to a mathematics curriculum that will engage your students in collaborative learning, problem-based learning, and mixed spaced practice.

JC Lewis

Timothy Scripko CPM Educational Program

18 Integration: More than area under a curve

9–12

Room 3139

Participants will experience a Calculus lesson that introduces integration without the typical focus on area under the curve. The activity will help high school teachers see how topics they teach, such as constant rate of change, are leveraged in Calculus.

Kristin Frank Rachael Talbert

Towson University

19 Writing to encourage learning in Mathematics

Room 3138

Session will provide strategies and activities to use writing in Mathematics to provide equity and rigor for all students. Writing creates a safe space for students to think and process the topic at their level.

Crystal Green Sarah Roden Anne Arundel County Public Schools

20 Taxicab Geometry: Playing in a Mathematical City

9–12

9-12

Room 3134

In this interactive session, we will explore and play in a non-Euclidean geometric system called Taxicab Geometry. We will investigate familiar ideas like lines and circles in an unfamiliar way to experience novel geometry while attending to structure.

Sandy Spitzer Michelle Tarr Alyssa Eller Kourtney Harrison Towson University,

Howard County Public Schools

21 Math Soup

Room 3133

A technique for explaining concepts of common multiples and factors is developed making use of analogies to logic questions facing a chef who is wondering what ingredients need to be bought.

Robert Koca

CCBC

22 Logarithms: We Can Do Better! 9–12 Room 3120

Room 3120

Ever wonder why students have such an aversion to logarithms? Students can estimate the square root of 7, yet ask them to estimate log base 2 of 7 and they are stumped! Participants will discuss the root causes behind why the traditional instruction on logarithms fails our students. Walk away with a better approach to instruction that begins with number sense and number talks. Then use that foundation to foster student discovery and understanding of the properties, graphs, and solving with logarithms. Additionally, embedded in the lessons are instructional and language routines to reinforce the teaching and student math practices.

Meredith Adams

Howard County Public School System

23 What makes math coaching successful? Tales from a research study on MQI Coaching

Leaders

Room 3127

The Mathematical Quality of Instruction rubric (MQI) grew from a research instrument to a tool for improving instruction. In this session, participants experience elements of the MQI Coaching model and hear research findings from a randomized trial of the intervention.

Jackie Kearney

Center for Education Policy Research at Harvard University

Session II Extended Sessions 10:15 am -11:45 am

24 Bead Strings 101

PreK-5

Room 2152

Are you looking for a different way to connect concepts from a concrete representation to a more abstract representation? Participants will explore how 100 Bead Strings can do that very thing. You will learn what they are, how they can be used for more than just counting, and see how to make connections from the concrete to the abstract.

Jennifer Stairs

Kristen Mangus

Howard County Public School System

25 Growing Mathematicians with Number Lines

PreK–5, Exhibitor Showcase

Room 3157

In this interactive session for K-5 educators, participants will explore the progression from number tracks to number lines and engage in games and

activities, using both digital and print resources, to help students improve their understanding of relative position and number magnitude.

Melinda Schwartz

ORIGO Education

26 Robotics in the Mathematics Classroom

6-12, Exhibitor Showcase

Room 3148

Join this hands-on session to learn how to make students beg to learn math! When students learn to "drive" the TI Rover, they are fully engaged and asking for more math. They don't want to leave class! Free activities will be shared. No coding experience necessary – come join the fun!

Robyn Poulsen

Texas Instruments

27 Fun with Problem Solving! 3–12 Room

Room 2161

This workshop features classroom-tested numerical and geometric problem solving activities that are suitable for students in grades 3 through 12, inclusive. These unique hands-on activities will be presented using physical materials and cooperative small groups.

Michael Krach Phyllis Hillwig Emma Talbot

Towson University

28 Arrêter de parler !! Using Protocols to Promote Student Engagement and Discourse during Instruction

6–8

Room 2170

To provide teachers with alternatives to stand and deliver and independent practice routines, Anne Arundel County Public Schools developed 18 protocols that promote student engagement and discourse. Come experience several protocols that you can immediately implement in your classrooms.

Mary Rathlev Nicole Howard Anne Arundel County Public Schools



Put on Your Thinking MCAP 6-12

Room 2162

Calling all middle school mathematics teachers! Are you excited for the new MCAP? Are you curious about how these new assessments will be different (or the same) as the old Maryland assessments? Would you like to know how assessment rubrics have changed and how the assessments are scored? Would you like to view some sample items? Then this is YOUR session! Come learn about the Grade 6, Grade 7, and Grade 8 MCAP mathematics assessments. Explore the new Evidence Statements, test out the new rubrics with sample items, learn about the new MCAP design, and have your questions answered.

Nina Riggs

Maryland State Department of Education

Explorations with Square, Triangular, Tetrahedral, **Pentagonal and other Figurate** Numbers

6-12

Room 2163

Figurate numbers exhibit a number of beautiful patterns. In this hands-on workshop, participants will explore patterns and relationships with triangular, square, tetrahedral, pentagonal and other figurate numbers. The diagonals of Pascal's triangle and technology will be incorporated in the workshop.

Jay Schiffman

Rowan University

Filling the Gaps with Algebra Tiles

6-12

Room 2164

Using a CRA (Concrete, Abstract, Representational) Model, teachers will examine strategies to reduce misconceptions in algebraic thinking through the use of Algebra Tiles to build conceptual understanding in students. Participants will examine opportunities to support student development of topics from Grade 6 through Algebra 2, that include simplifying expressions, solving linear equations, substitution, and quadratic expressions.

Chris Pirie

Kasey Barr Baltimore County Public Schools

🧿 🧿 Building Equity and Thinking In Math Classrooms 6-12

Room 2169

Learn how to implement Visually Random Groups and Vertical Non-Permanent Surfaces in your classroom pedagogy to improve student engagement in task group work and break down social barriers to problem solving.

Stacie Marvin

Howard County Public School System

Session III **Burst Sessions** 12:15 pm -12:45 pm

D D Hood College's **UU** Graduate Programs

General interest

Room 2172

Learn about Hood College's graduate programs in Mathematics Education (middle and high school tracks) and Mathematics Instructional Leadership (PreK-Grade 2 and Grades 4-9 tracks).

Christy Graybeal

Hood College

34 Technology and Games in Elementary Mathematics

3–5

Room 2152

Join pre-service teachers from McDaniel College to discover creative uses of games and other technologies in elementary mathematics. We will be targeting fact fluency and basic operations through online games, board games and more.

Jamie Wimmer Haley Chan

McDaniel College

35 Jumping Circles

Room 2161

We have created and implemented a variety of activities that focus on kinesthetic learning. The activities all include hula hoops and physical interaction. The students learn concepts like fractions and analog clocks, all while putting their bodies in motion. We have researched, collected, and analyzed data to show how this benefits students in the mathematics classroom.

Carly Berry Aryn Ramey Diana Cheng Michael Krach Towson University

36 Book Studies that Pack a Punch!

Room 2169

What professional resource is worth reading and will have immediate and lasting change in classrooms? Don't have funding? Let's talk about worthwhile titles and ways to help support the work you are doing.

Christine Thereault

Frederick County Public Schools

37 Please Submit Your Response in the Space Provided...

6–12

Room 2162

With 1-to-1 devices becoming more common in the classroom, students and teachers have a variety of online resources that promote and enhance mathematical reasoning and literacy. Participants will examine these tools and gain an insight on how they can be valuable assets in our instruction.

Peter Lo

Howard County Public School System

Building Better Problem Solvers One Cell at a Time

9–12

Room 2163

Use of Excel and Excel functions in the classroom to allow students to problem solve and use technology to their benefit. By using excel for basic operations and even to build/use formulas, we can put more emphasis on the topic and not the meniscal calculations that give students wrong answers and deviate them away from math.

Craig Chatterton

Harford County Public Schools

39 Coaching Lab: Dealing with Difficult Situations

Leaders

Room 2164

Are you dealing with a difficult coaching situation? In this burst session, we will have an opportunity to brainstorm ways to address challenging situations and role play strategies for addressing the difficult situation.

Jenny Novak

Howard County Public School System

Session IV Regular Sessions 12:15 pm-1:15 pm

40 The Impact of the Mathematics Identity

General Interest

Room 3109

How does your identify affect your teaching of mathematics? How does your students' identity affect how they learn mathematics? We will share lessons learned and offer suggestions for teacher coaching that we learned from our book study of The Impact of Identity in K-8 Mathematics.

Smitha Hughes Sheila Burke Baltimore City Public Schools

41 Using Questioning to Improve Student Thinking

General Interest

Room 3110

Teachers ask many questions every day. How can teachers use questioning effectively to improve achievement? This session examines how teachers plan, ask, and reflect on their use of questions, providing tools to create environments where students do the sense making.

Ed Nolan

Towson University

42 Introducing MCAP Grades 3-5 Mathematics

Pre-5

Room 2182

In this session, participants will be introduced to the Maryland Comprehensive Assessment Program (MCAP). This assessment is the accountability assessment that will be given to students in grades 3-5, spring of 2020. Come and hear about it's features (new and improved) and participate in using the rubric that will be used to score reasoning and modeling constructive response items.

Linda Schoenbrodt

Maryland State Department of Education

43 Successful Task Implementation

PreK-5

Room 3118

In this session participants will explore the impact that instructional strategies play in either maintaining or declining the cognitive demand of a task.

Nicholas Pyzik Sharon Brown

Baltimore County Public Schools

I can show what I hear: Connecting music to mathematics

PreK-5

Room 3119

Come and explore tasks that will engage your students in connecting different representations such as musical notations and Cuisenaire rods. A modeling task sequence to promote conceptual understanding of measurement ideas and unit concepts will be shared.

Tatiana Iliana Emma Talbot Melike Kara Kimberly Corum Towson University

45 Making the Most of Meaningful Models

PreK–5, Exhibitor Showcase

Room 3157

Versatile models help teachers to articulate topics across elementary grades. Participants will discover practical activities using number lines, dot arrays, and area representations that can be used to teach major ideas involving basic facts, whole numbers, fractions, decimals, and computation strategies with deep conceptual understanding.

Melinda Schwartz

ORIGO Education

46 Keeping It Real: Making Real-World Connections in the Math Classroom

K–5

Room 3106

We will present the benefits of making real-world connections in the classroom to the math concepts being taught. We will also share ideas of how to make real-world and authentic math connections throughout the school year.

Lynsey Hayden Andrea Morris

St. Mary's County Public Schools

47 Build your Toolbox: Strategies to Promote Growth with Modeling and Reasoning

1–5

Room 3116

Participants reflect on modeling and reasoning SMPs, analyze reasoning tasks including student work samples and determine instructional next steps. Walk away with sample rubrics, strategy menu and monitoring tools to promote depth and student growth within grade level standards.

Penelope Alberti Cheryl Wallace

Anne Arundel County Public Schools

48 CoveRing the bAses: CRA Using Base Ten Blocks, Part 2

3-5, Leaders

Room 3140

Older kiddos like to play too! The base ten block is the most unappreciated manipulative that we all have. Join in this session to "play" with blocks to develop estimation, multiplication, and division strategies. We will also use the blocks to strengthen area, perimeter and volume. Learn new ways to use these gems to breathe new life into your math class and students' understanding through the CRA approach.

Ryan Amore

Charles County Public Schools

49 The Make 10! Challenge: Representing Operations to Understand the Order of Operations

3–8

Room 2186

Ever wonder why the order of operations works the way it does or how to teach it conceptually? Engage in the Make 10! Challenge to develop understandings of the order of operations through representations and the meanings of the operations. This groupworthy task allows for significant personalization, customization, and differentiation.

Barbara Swartz

McDaniel College

50 Coaching: A Relationship Building Approach

6–8, Leaders

Room 3146

Learn how to use relationship building strategies to build the teacher's capacity to make instructional decisions, self-reflections on their practice and support student-centered learning through literacy.

Marsha Hubbard

lan Thorne

Prince George's County Public Schools

51 Empowering Teachers with Instructional Routines

6–12, Leaders

Room 3120

In this session coaches/leaders/teachers will learn how to motivate and inform all of the benefits of instructional routines within the classroom. Guidance on the importance of observing student's mathematical thinking, rewards for students, and equity based teaching practices.

Andrea Lang Meredith Adams Howard County Public School System



Room 3127

In this session, participants will learn more about formative assessment strategies, when to implement it into a lesson, and how to adjust a lesson off of formative assessment.

Christopher Houck

Pamela Xenakis

Baltimore County Public Schools

1 The Number Line: A Deep Dive 6-12

Room 3133

As mathematics teachers, numbers are our passion, and one well-known mathematical structure can help reveal this passion. Together we will dive into the number line to reveal special sequences and other rich mathematical curiosities, which will be unpacked and represented.

Mike Long

Howard County Community College

Looking For Zebras: Embracing Unexpected **Solutions to Pattern Tasks**

6-12

Room 3134

While we often associate visual patterns with a single solution, our session will push participants to reevaluate the role of pattern ambiguity. In order to allow for mathematical honesty while meeting specific mathematical goals, we offer a few suggestions to open up pattern tasks.

Dana Grosser-Clarkson **Elizabeth Fleming** University of Maryland

🔽 🗖 Coding in Math Class!

6-12, Exhibitor Showcase

Room 3148

Your calculator can code! I'll demonstrate how I effectively incorporated coding into my math classes - you can too! We'll even make music! No experience required.

Robyn Poulsen

Texas Instruments

Get Outta My Swamp! **U** Shrek Helps Calculus Students **Master Optimization**

9-12

Room 3139

In this session, participants will use substitution and the distance formula to create a function to model Shrek's swamp, then use Desmos to connect concepts regarding the graph of a function and its derivative in order to learn optimization.

Rachel Schmitz Gabriella Harris

Baltimore County Public Schools

Monopoly and Regression?

9-12

Room 3138

Participants will engage in a problem that can address four S-ID standards that also makes use of technology to illustrate the conceptual understanding in the standards.

Levi Straight

Baltimore City Public Schools

58 Inverse Functions: A Lesson Study Across Three Classrooms

9–12

Room 3121

This session will explore a lesson study done by the three presenters on inverse functions, an important concept in Algebra 2. Participants will explore the math task themselves, and engage in reflective discussion about how the three presenters were able to learn from each other's implementations in their respective classrooms.

Emily Murdock Neha Soni

Montgomery County Public Schools

Session V Extended Sessions 1:00-2:30 pm

59 Creating a Peer Coaching Collaborative in Your School

General Interest

Room 2179

Participants will unpack the purposes of classroom observations, discuss various models of peer coaching, share best practices, and create an action plan to start a coaching collaborative at their school for the 19-20 school year.

Laura Potter Chris Pirie Amy Parlette Baltimore County Public Schools

60 Math, Coding, and Programming... Oh My! Connecting Coding to the Standards for Mathematical Practice!

PreK-2

Room 3158

Do you love fun and engaging math activities? You will participate in a variety of hands-on activities to develop computational thinking and introductory coding concepts. You will engage in activities that include robotics, coding apps, web-based games, and unplugged activities to help increase problem solving, number sense, and basic operations..

Lauren Speiser

Howard County Public School System

Wait! Where are the Numbers?

PreK-5

Room 2152

Are your students number pluckers? Come learn about Numberless Word Problems and how to implement this technique into your math class.

Megan Dooley

Luanne Cochran

Charles County Public Schools

62 If Mathematics is a Universal Language, Why Do So Few Speak It?

3–8, Exhibitor Showcase

Room 2181

Discourse-driven classrooms become a reality when all students are enabled to think critically, collaborate to solve problems, critique the reasoning of others, and ultimately, own their learning with a growth mindset. This session will focus on strategies for facilitating and enhancing mathematical discussions in the classroom that will encourage students to own their learning, build a growth mindset, and develop deeper conceptual understanding.

Danielle Sullivan

Curriculum Associates

63 Effective Questioning and Discussion Techniques

3–12

Room 2161

Want to increase student engagement and performance while learning to allow students to drive their own instruction? Then this session is for you! We will focus on ways to pose purposeful questions and facilitate meaningful mathematical discourse, resulting in more student-led discussions. Be prepared to have fun in this interactive session!

Lorraine Harmer

Harmer Educational Consulting

64 Math 1-2-3 to X-Y-Z. Explore How One Strategy Builds a Cohesive Conceptual Structure Promoting Equity in the Classroom

3–12

Room 2169

The purpose is to engage participants in a mathematical concept through a hands-on approach that promotes inquiry, group work, and equity in a classroom. Participants will leave understanding the importance of equity and teaching using the Concrete-Representational-Abstract [CRA] learning trajectory.

Nicole Howard

Amanda Salveron

Anne Arundel County Public Schools

65 Shearing: Not Sheep but Shapes. Unpacking Geometry Coherence

6–8

Room 2170

Want to build on what students already know to help teach grade level geometry? Can shearing help your students understand the connections between figures? Can shearing help your students to visualize the Pythagorean theorem? Don't know shearing, come find out!

Stephanie Marvel Mary Rathlev Jonathan VerMerris Katherine Strong

Anne Arundel County Public Schools

66 Reversing "I Do, We Do, You Do" with Technology

6–12

Room 2164

Participants will see how technology can reverse "I Do, We Do, You Do" and facilitate group work, discovery, discourse and authentic differentiation. Differentiation occurs as students discover different pathways and develop conceptual understanding that leads to procedural fluency. Laptops and tablets required for full participation. Content covered will range from Math 6 to Precalculus.

Aaron Schwartz

Montgomery County Public Schools

67 Building Activities in Desmos, Part II

6–12

Room 2180

Participants will receive an introduction to the Activity Builder feature. Teachers will critique/enhance an activity and discover what makes a powerful Desmos Activity for classroom use. Participants will build their own activities within Desmos.

Chris Wright Brett Parker Baltimore County Public Schools

Sessions and Speakers

68 Using Algebra Tiles... From Polynomials to Completing the Square

6–12, Exhibitor Showcase Room 3156

In this session the participants will experience hands on activities in working with Algebra Tiles. The participants will leave the session with resources for lessons they can use in the classroom or intervention.

Timothy Scripko

College Preparatory Mathematics

59 Premeditation: A Thoughtful, Comprehensive Approach to Improving Students' MCAP Performance

9–12

Room 2162

We will share the process and resources we created and used over several months to prepare students (and teachers) for success on the MCAP. Components included Numeracy warm-ups, MCAP aligned warmups, a Saturday session, and four week before lessons.

Jena Staley

9 - 12

Kevin Mooney

Washington County Public Schools

70 Logarithm Properties Jigsaw

Room 2163

A "jigsaw" is used to discover properties of logarithms. In groups, students will look for patterns and construct viable arguments to create definitions of one of the log properties. Students will regroup to "Teach" their property to a new group.

Wendy Butz Melissa Berardelli

Harford County Public Schools

Session VI Regular Sessions 1:30-2:30 pm

71 Changing the Stigma that Math is "Hard"

General Interest

Room 3109

Most people have a negative conception about mathematics – why is that? In my presentation, I share the reasons and the research behind this misfortune and present ideas on changing the common perspective and outlook of math. I will present ways teachers can design positive experiences for students in mathematics to give it a better reputation with the upcoming generations.

Courtney Herzog

McDaniel College

72 Let's Dispel the Myths About Women and Mathematics

General Interest

Room 3110

Now is the time to be aware of the myths surrounding women and mathematics and to address them in the classroom. Working for equitable treatment of all students as we debunk these myths requires genderspecific strategies discussed in this interactive workshop.

Lorraine Howard

Women and Mathematics Education (WME)



73 From Obscurity to Focus: One District's Journey in Bringing Clarity and Purpose to Data Dialogues

General Interest

Room 3127

Explore how a local district used the implementation of a data inquiry protocol and collaborative sessions to bring focus and purpose to data dialogues and monitoring data. Participants will experience an assessment cycle, evaluate data, and engage in collaborative activities.

Karen Riley Jeffers Donicka Herod Regina Walters Carlene Young Prince George's County Public Schools

74 Planning and Teaching with ESOL in Mind

PreK-5

Room 3157

Techniques and strategies to plan and execute engaging and exploratory math lessons while keeping ESOL in mind. Learn ways to plan effective lessons and support all students without sacrificing exploration or engagement in your math class.

Alexandria Basile

Paige Gale Howard County Public School System

75 Collaborative Planning Menu: A Resource Tool

PreK-5

Room 3140

Collaborative Planning is the key to enhance both the teacher and student educational experience. But what does collaborative planning look like? Sound like? Feel like? The Collaborative Planning Menu will give you ideas and organizers that you can implement immediately.

Stephanie Layden MaryKate McGarvie

Anne Arundel County Public Schools

76 Beyond Explaining an Answer: Writing for a variety of purposes in the Mathematics Classroom

PreK-5

Room 3118

Writing in Mathematics needs to go further than just having students explain how they got their answer. In this session participants will learn about and explore a variety of writing purposes for the mathematics classroom.

Nicholas Pyzik

Baltimore County Public Schools

Making Sense of Number Sense Routines

PreK-5

Room 3116

You may hear people use the term number sense; but what does that mean? Join in learning how Number Sense Routines can deepen student's facility with numbers, how routines promote confidence and the flexible thinking of both students and teachers.

Kristin Morrissey

Anne Arundel County Public Schools

Using Tiered Tasks to Foster Mathematical Proficiency in All Students

PreK-5

Room 2182

How do we create and implement tasks to build mathematical proficiency in all students? This session will introduce a tiered structure to develop real-world tasks that are aligned to standards, promote SMPs, and allow students to work at differentiated levels.

Jennifer Hilberg Kelle Patton Baltimore County Public Schools

79 AA4A (Algebra Access for All) 3–12 Room 3138

This session will focus on equity concerns in mathematics education around access to advanced courses, entrance to college, and math-dependent careers.

Kerry Wenzel Levi Straight Dan Oliver

Baltimore City Public Schools

Computer Science Computational Thinking in K-8 Classrooms

K-8

Room 2172

Participants will engage in computational thinking learning experiences designed to address Maryland's K-12 Computer Science Standards. Beginning with hands-on introduction to core computer science concepts, participants will engage as students and then look at the same activities as teachers.

Paulette Shockey Jennifer Cuddapah Jiang Li Christy Graybeal Hood College

81 Learning Mathematical Concepts Through Authentic Learning

6–12

Room 3133

This presentation explores connecting mathematical concepts and skills to purposeful, relevant, and meaningful contexts, ultimately promoting a deeper level of understanding in the classroom.

Haitham Alkhateeb

University of Baltimore

82 Connecting the Current Topics in Mathematics Education

6–12

Room 3121

There has been a lot of information about Math Talks, Standards for Mathematical Practices, Formative Assessment, Writing in Math, etc. How are they related to middle and hich school and what can you do to move your students forward?

Judy Werner

Slippery Rock University

Basketball Functions: Engaging Students with Interactive Graphs

6–12

Room 3134

In this hands-on session, explore two kinds of interactive graphs: scores over time and predicted win probability from recent NBA and NCAA games. Students can learn powerful ideas about functions, graphs, and probability through this relevant and authentic task.

Robert Nedwick Sandy Spitzer

Towson University

84 Coding... There IS Math Involved

Room 3119

The session will be an open/interactive discussion debunking the myth that mathematics is not necessarily needed in coding

Takhia Gaither Stuckey

Howard County Public School System

85 The Why and How of Integrating Data Centric Lessons into Your Classroom

9–12

Room 2186

Using easy to access data sets and web-based data visualization tools will prepare students to meet the demands of a data-centric world. This session will introduce Little Apps and some supporting classroom activities, providing powerful tools to engage students with statistical concepts.

Carol Howald

Howard Community College

86 Keep Calm and Coach

Leaders

Room 3120

Coaches have the tall task of leading with vision, helping to maintain a positive team culture, ensuring alignment of written, taught, and assessed curriculum, and so much more. This work can be rewarding and yet it can easily overwhelm even the most organized and diligent person. During this session, we will engage in some exercises and discuss strategies to help coaches establish healthy habits that promote overall well-being and stability for themselves and thus the teachers whom they lead.

Damitra Newsome Robin White

Howard County Public School System

87 Residency -It's Not Just for Doctors

Leaders

Room 3106

In this session, participants will learn about the planning and implementation of a school support model that provides consistent, ongoing coaching to identified middle and high school mathematics programs. Baltimore County Public Schools secondary mathematics resource teachers will share how this model was developed, different modifications that were implemented, and how it evolved through meaningful feedback. Takeaways include a responsive coaching framework that uses best practices grounded in.

Kasey Barr Amy Morton John Fontinell Baltimore County Public Schools



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Speaker Index (by Session Number)

| Adams, Meredith 22, 51 |
|----------------------------|
| Alberti, Penelope 47 |
| Alkhateeb, Haitham 81 |
| Ament, Casey 6 |
| Amore, Ryan 2, 48 |
| Barr, Kasey |
| Basile, Alexandria |
| Berardelli, Melissa 70 |
| Berry, Carly 35 |
| Bogart, Denise 10 |
| Brown, Sharon 43 |
| Burke, Sheila 40 |
| Butz, Wendy 70 |
| Chan, Haley |
| Chatterton, Craig |
| Cheng, Diana 35 |
| Cochran, Luanne61 |
| Corum, Kimberly 44 |
| Cuddapah, Jennifer 80 |
| Dooley, Megan 6, 61 |
| Dykema, Kevin 4 |
| Eller, Alyssa 20 |
| Fleming, Elizabeth 54 |
| Fontinell, John 87 |
| Frank, Kristin 18 |
| Gaither Stuckey, Takhia 84 |

| Gale, Paige 74 |
|-----------------------------|
| Goulbourne, Taniesha 7 |
| Graybeal, Christy 9, 33, 80 |
| Green, Crystal 19 |
| Green, Victoria 9 |
| Grosser-Clarkson, Dana 54 |
| Harmer, Lorraine 63 |
| Harris, Gabriella 56 |
| Harrison, Kourtney 20 |
| Hayden, Lynsey 46 |
| Healey, Kelly 10 |
| Herod, Donicka 73 |
| Herzog, Courtney71 |
| Hilberg, Jennifer |
| Hillwig, Phyllis 27 |
| Houck, Christopher 52 |
| Howald, Carol 85 |
| Howard, Lorraine 72 |
| Howard, Nicole 28, 64 |
| Hubbard, Marsha 50 |
| Hughes, Smitha 40 |
| Iliana, Tatiana 44 |
| Kara, Melike 44 |
| Kearney, Jackie 23 |
| Kobett, Beth 8 |
| Koca, Robert |

| Krach, Michael 27, 35 |
|-----------------------|
| Ladick, Michael 16 |
| Lang, Andrea |
| Layden, Stephanie 75 |
| Lewis, JC 17 |
| Li, Jiang 80 |
| Lo, Peter |
| Long, Mike 53 |
| Magauay, Janice 15 |
| Maletto, J. Megan 5 |
| Mangus, Kristen 24 |
| Marvel, Stephanie 65 |
| Marvin, Stacie 32 |
| McCaffrey, Chris 3 |
| McGarvie, MaryKate 75 |
| Minkus, Mark 1 |
| Mooney, Kevin 69 |
| Morris, Andrea 46 |
| Morrissey, Kristin |
| Morton Amu 07 |
| |
| Moyer, Todd |
| Morton, Any |
| Morton, Any |
| Morton, Any |
| Morton, Any |

| Novak, Jenny | S |
|-------------------------|----|
| Oliver, Dan | S |
| Parlette, Amy | S |
| Parker, Brett 13, 67 | S |
| Patton, Kelle | S |
| Pirie, Chris 31, 59 | S |
| Potter, Laura 12, 59 | S |
| Poulsen, Robyn 26, 55 | S |
| Pyzik, Nicholas 43, 76 | S] |
| Ramey, Aryn | S] |
| Rankin, Julie | St |
| Rathlev, Mary 28, 65 | St |
| Richard, Greta 11 | St |
| Riggs, Nina 29 | St |
| Riley Jeffers, Karen 73 | St |
| Roden, Sarah | S |
| Salveron, Amanda | S |

| Schiffman, Jay 30 |
|--------------------------|
| Schoenbrodt, Linda 42 |
| Schmitz, Rachel 56 |
| Schwartz, Aaron 66 |
| Schwartz, Melinda 25, 45 |
| Scripko, Timothy 17, 68 |
| Shockey, Paulette 80 |
| Soni, Neha 58 |
| Speiser, Lauren 60 |
| Spitzer, Sandy 20, 83 |
| Stairs, Jennifer 24 |
| Straight, Levi 57 |
| Staley, Jena 69 |
| Straight, Levi |
| Strong, Katherine 65 |
| Sullivan, Danielle 62 |
| Swartz, Barbara |

| Talbert, Rachael 18 |
|-------------------------|
| Talbot, Emma 27, 44 |
| Tarr, Michelle 20 |
| Thereault, Christine 36 |
| Thorne, Ian 50 |
| Varlotta, AnnMarie 11 |
| VerMerris, Jonathan 65 |
| Wallace, Cheryl 47 |
| Walters, Regina |
| Waraksa, Salli 12 |
| Wenzel, Kerry 79 |
| Werner, Judy 82 |
| White, Robin 86 |
| Wimmer, Jamie 34 |
| Wright, Chris 13, 67 |
| Xenakis, Pamela 52 |
| Young, Carlene |



What Does Your Why Equal? How Does Your Passion Translate?

| Notes |
|-------|
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
| |
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