MEAD Session Descriptions 2018

A01: **Button Up Understanding** by DaNel Hogan (STEMAZing Teacher Leader) **FULL**
K-5
Buttons are a great #STEMontheCheap resource which can be used to engage young learners in lots of different ways to build number sense, relative positions, sorting and classifying, and so much more. Each participant will receive a set of buttons for classroom use.

A02: **Friends With Math** by Brandon Smith
2-6
We need to change society's relationship with math. What happens when you break math out of its artificial shell and spend time with it like you would with a friend? You get even more learning! Let's crack open the world of math experiences and see what building a friendship with math can be like for all of us.

A03: **Buttons, can you use them in a sentence?** By Leticia Lozano and Georgina Georgelos (STEMAZing Teacher Leaders)
K-8
Students will use attributes to sort and identify geometric figures, create table, create graphs and write using supporting evidence from their own work.

A04: **Introduction to Smarter Together! Using Group Work to Address Participation** by Marcy Wood (Complex Instruction) **FULL**
General Interest
This session is for teachers interested in promoting successful collaborative environments in their classrooms and who are new to Complex Instruction. We will explore how status interferes with participation in your classroom and experience some tools you can use to support all students’ successful collaboration, including supporting students who under participate.

A05: **Beyond the Algorithm: Addition and Subtraction Strategies that Make Sense!** By Kimberly Rimbey
K-4
Making sense of multi-digit subtraction requires strong connections with addition and place value. Join us as we explore addition and subtraction using concrete and visual models, connected to written work, and grounded in problem solving. Formative assessment strategies will be included.

A06: **Good Intentions Aren't Good Enough: Courageous Discussions around Mathematics** by Heather Lindfors-Navarro (Social Justice)
General Interest and Leadership
In this session, participants will engage in discussions to discern how motivation, bias, and personal math stories impact our instructional practices. The session will explore the structures and strategies that allow for courageous discussions which enable coaches and teacher leaders to make an impact in school sites where they themselves may not be of the dominant culture.

A07: **Math Task: Can You Figure it Out?** By Marcos Davila and Cathie Bonnell
6-8
Math tasks are a fabulous way to address math as a creative, quantitative thinking that opens up possibilities. Math tasks present contextual problems to students who must describe, within the context, what possible solutions could be. Students then translate from their words to math symbols. After several practices, students are excited, happy and enjoy the challenge of math tasks. Math tasks also even the playing field with students with different perceived knowledge and ability in math. It is interesting to see kids who many times struggle in math to become the empowered students and the students to which others look for ideas.
A08: **Social Justice Mathematics for Engagement and Empowerment** by C. Billy Campbell *(Social Justice)*  
6-12  
Calls for responsive curricula and teaching practices are opening spaces for teachers to explore content and teaching practices that engage students in ways that traditional approaches have not, and Social Justice Mathematics is one of those. Whether you are new to the idea or want to take your implementation the next level, this session will explore using Social Justice Mathematics at various levels in the classroom. From activities, to tasks, to full blown projects, come experience social justice mathematics in action, learn how to infuse your curricula with social justice, and come away with practical resources to use in your classroom.

A09: **Supplementing Teacher Preparation in Mathematics: Teaching experiences of Noyce Interns in the Algebra Academy** by Jose Fonseca, Dr. Cynthia Anhalt, Lucas Smith, Stephanie Lara, and Kristen Leyva  
6-12  
The University of AZ Mathematics Department was awarded a Robert Noyce Award from the National Science Foundation to increase the number of mathematics teachers graduating from the Secondary Mathematics Education Program (SMEP). AZ Noyce Mathematics Teaching (MaTh) offers a head-on response to the shortage of highly qualified mathematics teachers through multifaceted recruitment activities and by implementing a teacher preparation program that develops and strengthens prospective teachers’ abilities to work with diverse students across Arizona and the rest of the nation. Noyce Interns will share their teaching experiences gained by working within a teaching team focused on curriculum development, implementation and assessment in a 120-hour Algebra Academy serving rising 9th graders seeking preparation for high school algebra.

A10: **Desmos for Beginners** by Sharon Newman *(Desmos)*  
General Interest  
Desmos is now the official calculator of AzMERIT. Come learn about all that Desmos has to offer and get some hands on experience using this new and invaluable tool.

A11: **I Didn’t Know It Could Do That! (My Favorite Features of the TI-84 Plus CE)** by Betty Gasque *(TI-84)*  
6-12  
Explore new and hidden features of the TI-84 Plus CE, and incorporate these top ten “favorite features” to engage students and enhance the teaching and learning of mathematics.

A12: **Transformational Geometry in under 15 seconds?- Really!** By Judy Hicks *(TI-Nspire)*  
6-12  
See how your students can Play-Investigate-Explore-Discover reflections, translations, rotations and dilations – and their properties – quickly and deeply. Using these transformational geometry activities for TI-Nspire™ CX technology, teachers and students can spend their time doing the math, discovering and developing the concepts. Minimal preparation time is needed for these immediate interactive investigations. You do not need to have TI-Nspire handhelds in your classroom to still benefit from these activities!
A13: **The Magic of the Quadratic Equation Comes to Life** by Charles Collingwood, Camilla Ibarra, Carlos Valuneva, Yeohoo Youn, Ryan Hammond, Armando Cardenas, Evan Ellinsberg, and Nathan Schafer (Active Learning HS and College)  
9-12  
The study of the quadratic equation is a requirement for all algebra classes. In this presentation we will give a hands-on demonstration of the quadratic formula. We will build mini satellite dishes that will illustrate the usefulness and the importance of this equation. Former students will talk about their experiences in the satellite dish project in a Precalculus class. The satellite dish project along with many other project based learning (PBL) tools addresses some of the critical issues in mathematics classroom including, student motivation, differentiation and student engagement. Participants will leave with a prototype satellite dish and lesson plans to immediately implement this project in their Algebra 1, Algebra II or Precalculus classes.

A14: **Developing Students' Thinking Skills Undoubtedly Improves School Performance.** By Fortunato Rolando Meneses Ramos  
3-12  
The research focused on how to increase student achievement, from the student's own learning perspective, which will be evaluated through PISA. and how the educational systems of countries that have remained at high levels in PISA assessments have resolved this issue. We find that they insist on the use of the so-called traditional Chinese tangram; and although this object appears in many other educational systems as a curricular tool, not with the same focus and importance given by those first countries. Finally, the importance of this work is to provide a way to develop the Thinking Skills of every elementary school student and to strengthen these Capacities of many other high school students so that the student achieves sustained learning in autonomy.

A15: **Math Through the Eyes of a K-2 Learner** by Rachel Fernandez and Diana Nunez  
K-2  
This session will be geared towards increasing student motivation and engagement through mathematical representation and productive struggle. It will focus on creating visual representations for addition and subtraction story problems.

A16: **Teaching Math Through Projects** by Lauri Douglass and Ewa Zakrocki  
9-12  
Having students engaged throughout units using projects to further their knowledge in the content. Participants will experience three projects used with the Algebra I & Algebra II curriculum to support students that are not traditionally successful in the math classroom. We will discuss how to implement the projects and discuss the results that have come from using them in class.

A17: **It's a Game Thing: Addition & Subtraction Learning Games** by Nancy Casagrande and Liesl Scheffel  
K-5  
Play is a highly effective tool for learning. Come play some addition and subtraction games, all levels welcome. We will play a number of different addition and subtraction games that are highly motivating to students. We will discuss ways to modify the games to make them appropriate for all students; in addition to how to modify them to use with multiplication and division. Games will not require many additional materials, so they can be implemented right away!

A18: **Building a Conceptual Understanding of Area Under the Normal Curve** by Amanda Ross  
9-12, Community College  
The presentation will showcase many examples of calculating the area under the normal curve, given real-world scenarios. Multiple approaches will be utilized, including manual calculation and graphing calculator usage. Illustrations will accompany each example. Each participant will be given a copy of the standard t-table, with instructions on how to use it, in order to determine the mean to z area, larger portion area, and smaller portion area. This session is intended to prepare teachers for teaching (and assessing) Common Core standard S.ID.4.
A19: Absolute Integers by Betsy Mays and Donna Curran
6-8
Don’t let the negativity get you down. Use new and creative strategies to have a positive experience teaching the ups and downs of integers. With these new lessons and ideas students can more readily master the concepts of positive and negative numbers as seen in a variety of situations from number lines, 4 quadrant planes and real life situations.

A20: We Like to Move It, Move It! By Heidi Sweet and Jennifer Thompson
6-12
Come and participate in several different styles of in-class learning activities that foster movement, engagement, and conversation in your mathematics classroom. Attendees will participate in a short example of each activity and suggestions for differentiation will be provided. Each of the techniques involve high student participation and motivation while allowing the students to incorporate movement to help increase cognitive function. Activities presented are applicable to both middle and high school settings. Materials will be provided.

A21: Fraction Sense with Paper, and Tiles, and Rods...OH MY! By Cathrine Zbonack and Beth Egan
FULL
3-5
Student centered investigations and games help students build their conceptual understanding of fractions. Join us to learn how to facilitate engaging activities with cuisenaire rods, color tiles, and fraction kits. Have fun with your students while giving them the building blocks needed for long term understanding of fractions.

A22: Pens in Math Class: and other mindset strategies by Nova Kline and Leanna Trujillo
General Interest
We will present a session that addresses student engagement and motivation through utilizing growth mindset strategies and exploring using tools in mathematics classroom, such as pen. Participants will be provided an opportunity to understand how to create a growth mindset for their students while completing a series of math tasks in pen.

A23: Playing with Place Value by Tanya Jansen and Amanda Middendorf
K-5
During Playing with Place Value, we are going to be exploring hands on ways to show place value for grade bands K-2 and 3-5. For bands K-2, the focus will be on how to introduce the place value concepts. For bands 3-5, the focus will be on continuing to learn about place value using whole numbers and decimals.

A24: Building Blocks for Mathematical Understanding by Joan Jurik and Eboney McKinney (Modeling)
K-5
This session focuses on the Mathematical Practices of modeling and making use of structure. Participants will engage in hands on activities which promote the integration of these two mathematical practices into their math instruction. Together we will explore ways to identify the use of structure in students thinking and how to help students mathematize situations through modeling. The combined use of modeling and making use of structure will help engage your students in meaningful mathematical discoveries.

A25: Number Talks: 15 min to Number Sense and Fluency by Carrie Burdon and Lindsay Grundtisch (Number Talks)
FULL
K-5
Imagine a math discussion with no right answer and no wrong answer, a discussion where every voice is heard and all ideas considered. Number Talks is a daily 5-15 min math discussion for students of any age. Come experience a variety of talks and find out how to develop your students’ number sense and procedural fluency from a deeper level of understanding. You will leave having fun talking numbers!
A26: Let's Draw Equations by Angela Rico and Monica Garofalo

3-12
Do your students struggle with their understanding of the processes involving equations? Drawing visuals is a great strategy to help them develop their understanding of the process of solving equations. Learn how to help your students use this tool to develop their understanding.

A27: Vertical Alignment for SPED by Dawn Dolinski and Susan LaValley

Special Education

Since the implementation of common core state standards, general education teachers have focused on breaking down standards at grade level. While this is an important understanding, special education teachers require a stronger understanding of the outcomes at each grade level in order to determine accurate grade level growth. Within an IEP, we are held accountable to the grade level growth within IEP goals. In order to accurately understand the growth students are demonstrating, we must have an understanding of the difference of a standard from grade to grade. Vertical alignment is the key to understanding this growth. For example, what are the math fluency concepts for each grade level? What does it look like at grade 3? Grade 4? Grade 5? Grade 6? How does this impact our writing goals in math for IEPs? How does a special education teacher track where each student is? How does a special education teacher use data and which data does he/she use? All these questions will be addressed with clear examples of tracking systems. Presentation will follow a format of conceptual understanding allowing participants to discover answers to their questions through discovery.

A30: The math of Khan not the wrath of Khan! By Carman Ryken

6-8
I am a Khan Academy ambassador and I have lots of information to share about how to use Khan Academy for differentiation, flipped classroom, homework or just a fun activity in class. I am happy to work with teachers with no experience with Khan as well as teachers that just want to learn about the new updates started this year.
B01: Beads for Building Understanding by DaNel Hogan (STEMAZing Teacher Leader) FULL K-5
Do you know what a rekenrek is? Come learn the power of this great tool for teaching number sense and engaging students in math talks. Learn how to build your own #STEMontheCheap version of this useful tool. Walk away with supplies for building a class set of rekenreks and engaging students immediately upon returning to the classroom.

B02: The Three I's to Mathematize Anything by Brandon Smith 2-6
Math is everywhere and in everything, but yet we only see it in the classroom with paper and pencil. Let’s explore the three i’s to supercharge anything to become a math experience that enhances engagement and learning for all.

B03: Honey, I shrunk myself! By Leticia Lozano 6-8
Students will use ratios and proportion to calculate 1/8 scale miniature version of themselves. From the calculations create a template and finally a pipe cleaner version of themselves.

B04: 20 days to Smarter Together: Moving Your Students toward Productive Participation by Marcy Wood and James Smith (Complex Instruction) FULL General Interest
We know students learn more from talking with each other, yet getting each student to participate is challenging work. This session will introduce several 20 minute activities you can do to teach your students how to work with and talk with each other.

B05: Beyond the Algorithm: Multiplication and Division Strategies that Make Sense! By Kimberly Rimbey FULL K-6
Making sense of multi-digit division requires strong connections with multiplication and place value. Join us as we explore multiplication and division using concrete and visual models, connected to written work, and grounded in problem solving. Formative assessment strategies will be included.

B06: Taking Leadership for Social Justice in Mathematics by Linda Fulmore (Social Justice) General Interest
Get specific strategies to think deeper about social justice. Build lessons that include both mathematics and social justice learning goals. Use task analysis and culturally relevant pedagogy tools to ensure task appropriateness, rigor, and student participation.

B07: Algebra Tiles: Not just for Factoring! Connecting Area, Perimeter and Algebraic Expressions by Sharon Rendon 6-12
Learn how algebra tiles can make expressions transform into a concrete visual experience for your students. Tiles help students "see" the mathematics Jo Boaler refers to as a key piece in developing understanding of abstract concepts. We will explore connections between area, perimeter, variable expressions, distributive property, and solving equations.
The Algebra Academy: Lessons learned over 11 years of rockets and the teaching of math! By Rudy McCormick, Jose Fonseca, and Steven Martinez

6-12
The Algebra Academy is a five-week, 120 hour summer program for rising 9th graders that allows students to construct their understanding of algebraic concepts via small-group, hands-on projects where students experience the application of math to the "real world." Students begin by learning about the fundamental concept of variables as they begin to explore linear relationships and advance toward more complex algebraic equations, such as quadratic equations that help students predict trajectories of water bottle rockets. Lessons learned over the program's 11-year history will be shared by some of the founders of the initiative.

Desmos Activities by Gregory Epstein (Desmos)

6-12
Desmos is more than just a graphing calculator! Come learn about all of the pre-made activities, puzzles and more that the Desmos team has to offer. Learn about best practices and how to bring these activities into your classroom effectively.

Data, Data, Everywhere! Swim, Don’t Sink! By Betty Gasque (TI-84)

6-8
A picture really is worth a thousand words! Experience a variety of Statistics and Probability activities with a focus on the middle grades standards. We’ll use the TI-84 Plus to explore chance events, graph data, compare graphical representations, and investigate patterns of association. Additionally, we’ll discuss strategies to engage students and strengthen their graph interpretation skills.

Exploring the Finance App – Quantitative Reasoning in High School by Kim Thomas and Veronica Carlson (TI-Nspire)

9-12, Community College
Buying a car. Buying a house. Paying for college. Your TI-Nspire CX and the T-84 can help you make financial decisions. Financial literacy is usually a major component of most quantitative reasoning courses. Come and explore a few financial problem-solving situations that can be incorporated into any mathematics course using the technology already in your students’ hands.

Equations on the Number Line- So easy! By Janelle Chisholm

6-8
Come and see how to use a number line to solve one and two-step equations on the number line. Students of all abilities will LOVE this strategy. Handouts will be provided along with plenty of practice!

Did you really mean what you said? By Nora Ramirez (Social Justice)

General Interest
Currently, the term deficit is a buzz word in mathematics education. What are some examples of deficit thinking and deficit language as they relate to mathematics education? What messages do they convey to other teachers, students and families? How might we act and challenge others to take action as we strive for social justice?

Rejuvenating Mathematics Through Active Learning: PreCalculus and Calculus by April Strom (Active Learning HS and College) FULL

9-12, Community College
This presentation will be focused on rejuvenating the teaching and learning of mathematics through active learning, defined as (1) students' deep engagement in mathematical reasoning, (2) peer-to-peer interaction, and (3) teacher interest in and use of student thinking. These ideas will be illuminated through engaging the audience in tasks that promote active learning at the precalculus and calculus level.
B17: Putting the Language Back in Math by Philip Brown
9-12
Mathematics is a language because it uses symbols to represent ideas shared between people. So much of the "how to" is painfully obvious when mathematical expression are read as a question or statement, instead of as a pending operation. Paying attention to the physical arrangement of things provides insight, but ignoring these and recognizing operations only, creates a lot of confusion for students. A prime example is that often square root or exponential expressions are read as an operation when in fact they're often the most efficient way of writing a number. By demonstrating some ways that focusing on the language beginning with basic fundamentals, strong connections can be made to new and confusing mathematics.

B18: Probability Fair, students learning probability through carnival games by Carman Ryken
6-8
For five years now I have been teaching probability to seventh graders. Their favorite project is always our probability fair. Groups of students create and build carnival games. Each game needs to have a solvable probability. After they are done we throw a carnival for other students. My students need to explain the probability of their games to the players as they come through.

B19: Like Terms? What is that?: Using novel tools to build students' success by Kelly Hawley
6-8
With a focus on "real world" learning, Legos are used as a tool to teach like terms and combining/collecting like terms. Once the use of Legos has been applied and mastered, we then illustrate on paper in order to incorporate the use of positive and negative signs. This is geared for 7th graders just learning to write and simplify expressions as it leads them to more algebraic thinking.

B20: The Devil's Bridge by Catherine Parker (STEMAZing Teacher Leader) and Anelie Olivarria
4-8
Join us for a hands-on, minds-on lesson that integrates math, science, and language arts, and can be differentiated for grades 4 through 8. The lesson will be launched with a European folktale called "The Devil's Bridge". Students will participate in two bridge labs and then use that information to complete an engineering task. Math topics that will be addressed are independent and dependent variables, multiple representations, rate of change, domain and range of equations and situations, and communicating the relationship between variables. The task will touch upon the Science and Engineering Practices from the upcoming AZ Science Standards.

B21: Student thinking + visuals = math fun and mastery!! By Suzi Mast and Tracy Fazio FULL
K-5
How many times have you asked a student to explain their thinking? Visible mathematics is the answer to that question. How can we assist students to show us their thinking through drawings, representations and models. This session will provide teachers an experience with visualizing mathematical learning in grades K-5. Join us as we follow a progression of learning through number operations to find out what student thinking is through visual representations. Visualizing math assisting student in understanding, making connections, sense making and reasoning. Come have some math fun!

B22: Building Number Sense through Number Talks by Beatriz Leyva (Number Talks)
3-5
Students need to learn different mental math strategies in order to make sense of their answers. We will provide an environment where, through teacher and peer guidance, students will learn to explain their thinking on how they got a certain answer. This session will help you introduce some mental strategies to develop a stronger number sense. I have found Number Talks to be very helpful to English Language Learners as they practice how use the right vocabulary.
Patterns, Algebraic Thinking, and Functions for Elementary Students, Say What?! By Deirdre Calhoun

K-5

I know what you are thinking, but don’t panic. Recognizing, describing, and expanding patterns are crucial for developing math skills, so I always start the school with patterns (K-4). In the younger grades, I show them patterns and we describe them. In the upper elementary grades, they create patterns, and the other students try to guess them. I will share with you some quick and fun activities that incorporate patterns, algebraic thinking and functions for all elementary grades.

Model Drawing: Supporting successful problem solvers by Lina Szabo, Sharon Flores, and Elizabeth Coley

K-5

This session is intended to provide educators with a tool that can help facilitate problem solving. Model drawing will be a key component in this session and the presentation will show how it can be used across grade levels.

"Sensible" Ways To Teach Number Sense by Jennifer Blake and Lauren Hewlett

K-2

Our focus for this presentation is about creating a foundation for mathematics by fostering number sense in primary-age students. Subjects include technology integration, decomposing numbers, counting and cardinality, as well as story problems. You will leave with a variety of engaging and motivating math activities that cover a wide range of standards. This presentation will also include tips and strategies for differentiation as well as creating a number sense in English-language learning students at the primary level.

Making Sense of Modeling or MP4U by Lori Valentine and Holly Lopiccolo

K-2

What does mathematical modeling look like in a K-2 classroom? Did you think that modeling only involved using manipulatives? We will look at Mathematical Practice Standard 4, Model with Mathematics. You will see how you can engage and motivate students at all levels to show understanding of varied math situations. You will leave this session with ideas that you can take back to your classroom and use next week.

Mini Mathematician Magic by Susan LaValley and Dawn Dolinski

K-2

It's finally here! An engaging and useful workshop that will give your Mini Mathematicians a love for mathematical practices they will never forget. Through visualization and mental math strategies you will show your youngest learners how numbers and geometry is all around them everyday in their world. Discover how to integrate your curriculum and explore math in many different ways throughout all content areas and keep student engagement high. We will discuss and explore quick assessments that will help you scaffold and differentiate instruction at the individual level. Come learn to love math through the eyes of a child!

How to Plan Differentiation with Leveled Scales by Melanie LiCausi

K-8

This presentation will introduce the concept and structure of learning goals and scales, as outlined in Robert Marzano's compilation of research, "The Art and Science of Teaching..." . Attendees will see examples of specific scales created and tested for my own multi-age classroom. They will learn how I blended the alignment of content from successive grade-level standards; as well as higher order thinking skills to create the levels for each scale. They will see actual student work samples from assessments I created and used to align to the scales. They will also see student examples of the portfolios we created to track and share student growth. Attendees will apply these ideas to plan some differentiated content based on specific standards. There will be discussion and reflection periods to brainstorm and share possible applications of the ideas in their own classrooms.
Star Tug-of-Wars is based on Marilyn Burns’ "Mathematical Tug-of-War." The tug-of-war problem is a way for students to practice their abstract and logical reasoning skills as stated in the Mathematical Practices in order to solve the problem. From symbol representation to operations with fractions, students and teachers will have multiple avenues in which to take this problem into the realms of procedural, understanding, and application. Most of all, students will be writing in mathematics!
C01: Fostering High Math Achievement for All Elementary Students: Practical Help Differentiating Instruction by Amy McDonald and Harold Campbell

The new Arizona state standards mandate that all students, including those with disabilities, be exposed to grade level standards. In addition, the state requires that the vast majority of students receiving services for disabilities take their grade level state assessment alongside the rest of their peers. This session will focus on the best research based techniques teachers can employ to help any struggling students, and particularly those with disabilities, become successful in mathematics at their grade level. We will discuss best practices for differentiating instruction, incorporating manipulatives, utilizing engaging apps, and modifying curriculum in intentional ways (to align with IEP goals). More specifically, we will provide examples of these research-based instructional practices and activities aligned to key target standards at multiple grade levels. The goal is to inspire and equip educators to help ensure that all students have access to high levels of mathematics and that all students have the best opportunities to be successful in their mathematics classrooms.

C02: Make education a “way to”, not a “way out”: lessons from work in communities around the world by Chadd McGlone and Carlos Vieira (Social Justice)

Providing education in high needs communities can change the lives of its residents, if teachers know how to provide it and students see what they are learning as valuable. In this presentation, we will talk about Teachers2Teachers Global is doing in communities around the world, working with teachers teaching first-generation students. Via Skype, participants will learn from a participant living in a remote community in the jungle of Ecuador to learn the about how education has impacted that community. Finally, participants will discuss the role of Global education and culturally-relevant lessons in their classrooms.

C03: UA Updates: A New Math Class, New Math Placement Procedures, and a Math Course for Advanced Students by Tina Moore, Tina Deemer, and Deanna McDonald

This session will highlight and discuss some of the upcoming changes to math placement at the University of Arizona and a new course for freshmen: Exploring and Understanding Data. (This course can be taken instead of the traditional College Algebra to fulfill the gen ed math credit for many non-STEM majors.) In addition, we will also discuss an exciting program for those high school students who, through acceleration, have run out of available math classes in high school. This session will be of interest to a wide-range of math teachers--from those middle school/high school teachers wondering what's ahead for the accelerated student or non-stem students.

C04: Improving Your Teacher Moves: Helping Your Students Get the Most from Your Lessons by Marcy Wood (Complex Instruction)

Getting students to participate effectively in groups is challenging work and requires that we rethink the kinds of things we do during a lesson. This session will focus on you and what you might do during a lesson to support students in learning more from each other.
C05: Decimals are Fractions, Too! Helping Students Connect Fraction and Decimal Understanding
by Kimberly Rimbey FULL
4-8
Have you ever wanted to help more students connect fractions and decimals? Do your students struggle to see the connections once you begin adding and subtracting them? Come and learn engaging student-active ways to help them make sense of the connections and truly "see" their interrelatedness. Making sense of decimal concepts and operations requires strong connections with fractions and place value. Join us as we explore fraction and decimal multiplication using concrete and visual models, connected to written work, and grounded in problem solving. Formative assessment strategies will be included.

C06: Rosy's Rule: A Student's Demonstration of Coherence by Heather Lindfors-Navarro
3-5
In this session we will explore the power of letting go and how it resulted in the teacher becoming the student. Participants will be guided through the thought process of a 5th grader who developed her own algorithm which demonstrated the coherence across the domains of Operations and Algebraic Thinking and Number and Operations with Base Ten and Fractions. Her thinking demonstrated a culmination of understanding that led to deeper understanding not only in that classroom but for students for years to come!

C07: Tools, not Toys - Using Algebra Tiles for factoring and beyond! By Sharon Rendon
6-12
Experience algebra tiles in order to make abstract symbolic expressions transform into concrete representations for students. Teachers will explore tasks using algebra tiles and how one might use them to develop an understanding of the relationships between an area model for rectangles, polynomial multiplication, factoring and division.

C08: Creating a Classroom Community of Active Learners in Calculus by James Vicich (Active Learning HS and College)
9-12
Participants will engage in paired-board work and use of the doc camera to model effective instructional techniques that increase students' conceptual understanding, problem-solving behaviors, confidence and communication skills. Changes in beliefs and attitudes for both teachers and students that are required to improve the nature and quality of classroom discourse in a student-centered environment in which the ultimate authority resides in the mathematics itself will be discussed.

C09: Hands-On Geometry with Polydrons and Geoboards by Rebecca McGraw
6-12
In this session, we will build polyhedra using Polydron manipulatives, investigate (and prove!) math relationships such as Euler's formula, explore tessellations of the plane, and use Geoboards to model shape and area relationships. Come join us to learn about some fun and motivating math activities designed to engage all students in active learning.

C10: Advanced Desmos by Gregory Epstein (Desmos)
9-12
Desmos is now the official calculator of AzMERIT. Come learn about some of Desmos' advanced features and how Desmos can be leveraged for AzMERIT computer based test takers. Come ready to tackle challenging puzzles and create amazing tools!

C11: STEM Activities: A Powerful Path to Growth for All Students by Judy Hicks and Betty Gasque (TI-84)
6-12
Experience STEM-related activities for the TI-84 Plus CE designed to connect mathematics and science concepts and motivate classroom discourse. We'll first design an experiments and use a temperature sensor to collect and analyze data and compare lines of fit. We'll then analyze data from NASA on global temperature trends and compare predictions based on various mathematical models.
C12: Get Students Energized with Graphing Technology by Veronica Carlson and Kim Thomas (TI-Nspire) 9-12
In this interactive session, participants will explore hands-on activities, utilizing graphing technology that make it possible for students to learn, practice and discover mathematics, which enable students to be engaged and be empowered in algebra classes.

C13: Proportional Reasoning Made Easy by Janelle Chisholm 6-8
Join us to see how to use ratio tables to solve real-world problems. Your students will use what they already know to figure out what they don’t know. Handouts will be given and plenty of practice problems will be presented.

C14: Differences in Language and Culture Impact Equity, Access, and Empowerment—Right? By Nora Ramirez and Bob McDonald (Social Justice) General Interest
Join us for a game that explores the relationship between communication and cultures. Experience challenges faced by individuals from a non-dominant culture. Reflect and discuss the impact that these differences have on learning mathematics. Use this game as a tool to begin discussions with colleagues about equity, access, and empowerment.

C15: Exploring the Place Value Progression Through Purposeful Activities by Karen Couch-Murphy and Paulina Jarrett FULL K-5
Place Value is a fundamental concept and the understanding of place value follows students from Kindergarten to High School and College and Beyond. Understanding place value progression is essential to success. Our workshop will provide a K-5 trajectory in Place Value with engaging activities to support each grade level. Using the trajectory and hands-on activities, teachers can support students with guided, scaffolded instructional practices to deepen and broaden conceptual understanding of place value.

C16: Visualization/Smart Guessing: Pedagogical tools to develop conceptual understanding to solve equations. By Jose Fonseca General Interest
Many middle and high school students have found that learning to solve problems in mathematics purely deductively – a process that follows the logic and formal framework of mathematics as a pure science- is a particularly difficult and frustrating experience. The learning process to solve problems in mathematics requires the ability to visualize concepts and also to manipulate them symbolically. In this perspective, visual imagination and mental manipulation are tools that support the students’ understanding to solve problems. In this session, we will discuss and examine visualization and smart guessing approaches to solve different types of equations that could be used for an entire algebra class session.

C17: Culturally Relevant Contexts in Mathematical Modeling by Aliceson Smith and Cynthia O. Anhalt (Modeling) 6-8
Participants will engage in a culturally-rich mathematical modeling task as a basis for a discussion on key elements of the mathematical modeling process. This activity will serve as a preface to participants’ analysis of work by students from a rural school near the southern U.S. border. The students’ cultural backgrounds were leveraged to engage them in community-based modeling tasks that led to meaningful mathematical explorations, discussions, and assumption-making, while providing opportunities for ownership of their mathematics learning. This session will explain how the task context promotes mathematical modeling elements, including making sense of a situation, researching background knowledge, assuming circumstances, creating a model, interpreting the results, and communicating their models and solutions. Scaffolding ideas to engage and motivate students will be provided.
C18: **Building your Problem Solving Muscles: It is not as easy as it sounds!** By Toni Martinez

6-8

It is challenging to help secondary students become successful problem solvers. At the crux of that is helping them think algebraically. In this workshop we will use fundamental Algebra concepts to develop mathematical reasoning and problem-solving skills in our students. We will flex their algebraic thinking muscles to better prepare students for higher level mathematics and for the workforce that they will enter.


3-5

During this session you will examine and complete a task using Mathematical Practice MP4: Model with Mathematics. The task we will explore addresses applying mathematical strategies relating to events in the real world - such as family celebrations and birthdays. You will leave with a planned task that can be immediately implemented in the classroom. We will share effective strategies for introducing the task, and options for adapting the task to different grade levels and family contexts. In addition, you will examine student work from this task at various grade levels.

C20: **Group Worthy Mathematical Tasks** by Beatriz Santacruz, Owen Hewlett, Dwight O. Valencia, and Viridiana Villa (Complex Instruction)

3-5

Math is often taught as a discernible set of discrete skills rather than a fluid process in which skills are viewed as components of the "thinking" behind a given problem. Teachers are often confounded when students cannot apply mathematical skills to real world problems. How can we create a classroom of engaged students that promotes rich mathematical discourse and allows students to explore the constructs of mathematical structures? The answer is group worthy math tasks! Creating and using group worthy math tasks can have a positive impact on student learning, content retention, and can deepen their conceptual understanding of mathematics.

In this session, you will learn:

- what a "group worthy" task is.
- how to implement group worthy math tasks.
- how to create your own group worthy math tasks.

Teachers who are just beginning to implement mathematical tasks will participate in hands on activities to see the benefits of using this highly engaging instructional tool in their own classrooms. Additionally, teachers will be given the opportunity to work with their peers to formulate a group worthy math task to use with their students the next week.

C21: **Pop, Play, STEM! Building Pringles Can Race Cars to Increase Student Engagement** by Kelly Blankenship (STEAMAZing Teacher Leader) **FULL**

K-5

In this STEM centered presentation, teachers in grades K-5 will learn how to have their students construct a Pringles- can race car following the engineering process. Students will have a blast constructing the car while acting like engineers in their design teams. After they have successfully built their cars, the math fun begins! This lesson can be modified to fit all levels of math, with K-5 standards being the focus of this session. From simple number counting and identification, all the way to calculating speed and dividing decimals, your students are going to have a blast using their balloon-powered cars to complete standard-based math activities.

C22: **Subitize This!** By Lindsey Mellen and Mary McGraw

K-2

What is subitizing and how does it relate to numbers, quantities and basic operations? Find out how devoting a few minutes a day can make a positive impact on building your students’ number sense.
C23: **How Number Talks Create a Mathematical Community** by Elisabeth Bankhead, Anne Warner, and Katie Nicholas *(Number Talks)*  
K-8  
Number Talks are a great tool to help to include all learners, set up a culture of acceptance and communication about math, and engage learners directly with content. This is how we have used this tool in our classrooms and changed from procedural to conceptual learning.

C24: **Authentic, Meaningful Writing in the Math Classroom** by Tara Guerrero and Lauren Daniels  
General Interest  
Writing in mathematics can be used as an assessment tool and an instructional strategy. This session will focus on effective math communication which encompasses writing, speaking, and listening for all students including ELs. Participants will learn different writing strategies and receive clear examples that they can use as models in the classroom.

C25: **Come On, Get Active** by Julie Groce  
General Interest  
If you're active and you know it, clap your hands! Or raise them! Or go to a corner of the room! In this session, participants will experience active participation exercises that can be used in any classroom. We will share ideas and model how these activities might look in action in order to get every student engaged.

C26: **Twelve Commandments for Evaluating Any Numerical Result** by Jason Makansi  
General Interest  
Presentation is based on author's latest book, recipient of the 2017 GOLD IPPY Award for Humanitarian/Social Issues and the 2016 Forward Reviews Silver Medal in Social Science. In Painting By Numbers: How to Sharpen Your BS Detector and Smoke Out the Experts, Mr. Makansi outlines twelve commandments for gauging the validity of a numerical result and applies them to controversial political and cultural situations from everyday life. Author's thesis is that, in a world driven by numerical analysis, algorithms, and computer models, every citizen must be equipped with basic tools for quickly evaluating numerical information bombarding them 24/7/365. Math instructors will come away with a fresh approach for helping their students connect what they learn in math class to current events.

C27: **Reasoning Routines that Stick: Promoting Learning that Lasts** by Jane Gaun  
3-12  
Does it sometimes seem like everyday is a first date with your students? When you ask about content from yesterday, last week or from a previous unit do you look out at “deer in the headlights?” In this fast moving and interactive session we will explore the question, how does learning “stick”? And, together we will practice some routines using content from the AZ Standards and the examine the underlying theory that makes these simple yet powerful additions , “must haves” for your teaching toolkit.

C28: **More than "just" mathematics: Using media artifacts as invitations to engage with local and global contexts** by Lynette Guzman and Jeffrey Craig  
General Interest  
An infamous question in mathematics education, "When am I ever going to use this?" poses a challenge for instructors to take up in their practice. Connecting mathematics content to rich contexts, however, is difficult and might seem contrived, especially when we construct disciplinary borders that privilege mathematics as the sole focus (or purpose) in our classrooms. In this interactive session, I will share what I have learned as a mathematics educator who engages student learning through local and global contexts by using multimodal media. The intended audience is for all who are seeking ideas for resources, wanting to have conversations and collaborations with colleagues, and hoping to (re)imagine what is possible for mathematics classrooms.
D01: Fostering High Math Achievement for All Secondary Students: Practical Help Differentiating Instruction by Harold Campbell and Amy McDonald

6-8
The new Arizona state standards mandate that all students, including those with disabilities, be exposed to grade level standards. In addition, the state requires that the vast majority of students receiving services for disabilities take their grade level state assessment alongside the rest of their peers. This session will focus on the best research based techniques teachers can employ to help any struggling students, and particularly those with disabilities, become successful in mathematics at their grade level. We will discuss best practices for differentiating instruction, incorporating manipulatives, utilizing engaging apps, and modifying curriculum in intentional ways (to align with IEP goals). More specifically, we will provide examples of these research-based instructional practices and activities aligned to key target standards at multiple grade levels. The goal is to inspire and equip educators to help ensure that all students have access to high levels of mathematics and that all students have the best opportunities to be successful in their mathematics classrooms.

D02: It’s about the numbers! The role of social justice and human rights in the STEM classroom by Chadd McGlone (Social Justice)

General Interest
The problem twelve plus four might seem simple enough, but it means so much more meaning in you know twelve hours is the average amount of time a farmer in Guatemala works and he spends two hours traveling to the field and back. In this presentation, we will talk about how making real-world connections in the STEM classroom provides an avenue to explore social justice and human rights issues. Participants will learn how to utilize a free, online resource to make these connections using stories about cultures around the world.

D03: Supporting Lesson Design with Instructional Rounds by Mona Toncheff FULL Leadership and Coaching

How do teachers make connections between content, process standards, and NCTM’s Mathematical Teaching Practices to meet the learning needs of each and every learner? Explore tools and structures with intentional lesson design to create and reflect upon lessons that promote mathematical understanding.

D04: Mathematical Superheroes: Create a Justification League in Your Classroom by Marcy Wood (Complex Instruction) FULL K-5

We usually have a few students who have easily identifiable mathematical superpowers. These students are quick at calculations and can take over mathematical activity. Yet, if we give our students multiple kinds of mathematical activities, we find that each of our students are mathematical superheroes with important problem solving powers. This session will provide activities for uncovering, celebrating, and using our students’ mathematical super strengths to create a classroom community focused on justification and mathematical learning.

D05: Harmonizing Problem Solving and Place Value in pK-2: Classroom Strategies that Really Work by Kimberly Rimbey FULL K-2

From subitizing to multi-digit operations, place value provides a critical foundation for student success in math. Join us as we explore concrete and visual models, mental strategies, and context problems that make math meaningful in the early years. Formative assessment strategies will be included.
D06: **NCTM Grants and Scholarships from the Mathematics Education Trust** by Linda Fulmore

*General Interest*

Learn about grant and scholarship opportunities from the Mathematics Education Trust (MET). MET supports the work of teachers with financial support for individual or school professional learning, coursework, technology purchase, conference attendance and more. There are specific grants for pre-service teachers and university mathematics educators. Receive tips for writing a successful grant.

D07: **Kids Love Fractions!** By Marcos Davila and Cathie Bonnell

*FULL*

3-8

Fractions can be fun!! Learn how to make sense of fractions for yourself and your students. Understanding fractions are the number 1 indicator of success in algebra. Don’t let your kids fall in the cracks. We use a math tool, on paper, that is constantly readily available to anyone and easily allows for differentiation. Our tool helps students understand and make sense out of math. We stress the math practices of making use of structure and strategic use of math tools. From basic understanding of fractions to easily solving simple algebraic equations with fractional coefficients, our tool, is what makes fractions fun and understandable.

D08: **Addressing Equity Using Collaborative Learning that Works** by C. Billy Campbell

*(Complex Instruction)*

9-12

Have you ever wished that you could engage all students in ways that provide equitable participation? Do you want rich learning opportunities that provide a high cognitive demand for all students? Have you ever wanted to develop a community of learning in your classroom where students work together and learn from each other? If you answered yes (who would say no?) then Complex Instruction might be for you. CI is a practical method of making collaboration amongst your students not only successful but also empowering. Come experience CI for yourself and leave with materials and ideas about how CI can work for you and your students.

D09: **Teaching math: Insights from an after-school program** by Nishaan Ponnuru, Arnulfo Velasquez, Lynette Guzman, Daniela Bermudez, Steph Lara, and Jorge Martin Mendoza

*6-8*

We will present some of the activities that we used to engage grade 7 students in doing mathematics in an after-school setting. Our objective was to make the experience of doing math engaging to students by connecting mathematics to their real-life experiences. We will share some valuable insights that we gained as educators into student learning and teaching mathematics through our experience with the after-school program.

D10: **Desmos Make Your Own Activities** by Sharon Newman

*(Desmos)*

*General Interest*

Desmos is more than just a graphing calculator. Come learn how to use Desmos' Activity Builder to bring your own activities to life. Come ready to build and explore all of the possibilities that Desmos' Activity Builder has to offer. (Bring your favorite paper pencil activity.)

D11: **Data Collection Activities for the Calculus Class** by Bruce MacMillan

*(TI-84)*

11-12, Community College

Let’s collect some data, find functions that will model the data, and then apply (or discover) some calculus concepts to the functions.

Sounds like fun to me!

Bring your graphing calculator!
D12: Seeing is Believing - STEM Activities with the TI-Nspire™ by Betty Gasque and Judy Hicks
(TI-Nspire)
6-12
Use the TI-Nspire CX and engaging STEM-related activities to address some of the Arizona Mathematics Standards for Statistics and Probability. You’ll use a temperature sensor to collect and graph real data and to develop and compare mathematical models. Other activities include the analysis of global temperature data and the interpretation of motion graphs (position and velocity).

D13: Fractions ARE FUN! Really! By Janelle Chisholm
3-5
Do your students struggle with fractions? If so, come and experience using a number line to solve all sorts of real-world fraction problems. You will be amazed how easy it is, and your students will be AMAZED.

D14: Experience A Multiple Representation Tool for All Grades—Easy to Use and Adapt for Diverse Students by Nora Ramirez
General Interest
Come and experience It’s all about…, a graphic organizer easily adapted for many mathematical concepts. This tool attends to conceptual understanding, visual representations, use of language and making connections. Examples for many grade levels will be shared. Participants will be given opportunities to design an It’s all about… for their use.

D15: May I Have Your Attention PLEASE?! By Jenifer Hutchinson and Elisa Estrada-Garcia
FULL
General Interest
Do you want to get ALL of your students excited to come to class and ready to learn? You don’t need gimmicks or prizes to get your students’ attention! In this session you will learn the neuroscience behind empowering ALL students to learn. Learn the science behind the fear of math, and how as educators, we can utilize brain-friendly strategies to increase student participation and achievement, without completely changing your curriculum or spending money on extrinsic motivators. We will also focus on mental manipulation for memory retrieval and retention, and how to maximize and maintain student attention and focus.

D16: The MarbleOus Math Bonder by Thanaa Salloum and Donna Perea
K-2
I was a kindergarten teacher (current preschool teacher) striving to find a way to help my English Language Learners who painfully struggled in math (especially addition & Subtraction). My pursuit led me to develop a tool to help them. Soon, they became more engaged and motivated to work on math and composition/decomposition became more fun, easy, and enjoyable. At the end of the year, they scored higher than their mainstream peers. Come and learn about this tool, and provide your input. Let’s discuss its implications. Finally, take a short survey about the tool and you will have become part of its final development!

D17: Let Them Fail: Engaging Students in Productive Struggle by Sydney Scharer and Shaylyn Grow
FULL
K-5
What better way to explore productive struggle than to experience it yourself? During this hands-on session you will take a walk in your students shoes. Activities that provide productive struggle are engaging, great for differentiated instruction, and reinforce learning. These activities require little planning and yield a big reward! This session will provide tips on how to establish this mindset in your classroom and build critical thinking skills through problem solving.
D18: Every Student Can Be a Problem Solving Detective by Agi Post and Chrisie Dang
3-5
To help all students be successful problem solvers we need to teach them to identify the structure of each word problem. Students learn to represent the structure of the problem with correctly labeled tape diagram models, which will then show them what they need to do to solve the problem. This model of problem solving allows for student choices and sharing of ideas, therefore increasing motivation and active participation. This process is equally effective all the way from kindergarten through high school and beyond.

3-5
During the session, participants will explore specific math modeling tasks we have developed related to our work as teachers in South Tucson. We will discuss our experiences implementing modeling tasks, and share examples of students' work and solutions. We will end the session with time to brainstorm other math modeling tasks that connect to social justice issues in our communities.

D20: Progressions of Math Common Core Standards by Elizabeth Stevens and Lucinda Fair (Number Talk)
K-5
Progressions of Math Common Core Standards will discuss the progression of standards in addition, subtraction, multiplication, and division. Participants will have the opportunity to discuss content knowledge in their grade level and unwrap the standards that address the four operations. They will then align the progressions of the standards. Participants will also receive experience with number talks and discuss benefits and successful experiences to share instructional ideas.

D21: How does it grow? Patterns with purpose. By Sara Thompson
6-8
Building conceptual understanding of slope and y-intercept... Easier said than done, but here at MEAD, we're doing it! Join us for some fun and engaging problem-solving with patterns as we work together in teams as we shift between the multiple representations of the linear web. Learn how your students can (and will) make connections between a table, graph, rule, and pattern to fully understand and apply y=mx+b.

D22: Using water to invert and multiply by Matthew Weber
6-8
I will showcase a learning activity that uses water and containers to develop a meaningful foundation for the invert and multiply algorithm for division by fractions. This activity involves the "how much in each copy" meaning for division, which is rarely used in classrooms as a way to make sense of division with fractions. Participants will be able to get their hands wet as they work through some tasks that were pioneered during a 2017 summer math camp for middle school students.

D23: Origami: A Dream Unfolded by Stephanie Rojas and M. Craig
6-8
Origami is a way to share culture, history, science, art, language, and mathematics! Fold with two experienced origami instructors who love to share the joy of origami! Transform one square piece of paper into the traditional crane, into a heart for Valentine's Day, or get creative, and bring your favorite design to share! If you can dream it, you can fold it!
D24: Teaching With a Twist: Using Rubik’s Cubes in the Classroom. By Christina Loria
6-12
Have you ever wanted to incorporate Rubik’s Cubes into your math lessons? Have you considered starting a Rubik’s Cube club at your school? Did you know you can borrow class sets of cubes to use in these endeavors? Did you know that you could borrow hundreds of Rubik’s Cubes at a time to build mosaic artwork? In this session, you will learn about how one TUSD math teacher has implemented the use of cubes with 7th through 12th graders and you will get some hands-on time with the Rubik’s Cube. This session is appropriate for all grade levels (K-12) and appropriate for all levels of cube proficiency.

D25: Math in a Minute by Linde Mohr
6-12
We’ve all had those “dead spaces” in class. The lesson ends early, they finish their tests quickly, a fire drill or a burp disrupts class and you’ve got to “rein them back in”. This presentation offers a good handful of “math one liners” — stand-alone problems that engage quickly but still require deep thinking. Use them to refocus the class, fill those last minutes before the bell or bridge a transition. Pretty sure that none of them is original—all I’ve done is collect them, organize them and use them in different ways. If you’ve got similar math attention grabbers, bring and share!

D26: Sliders - They’re not just for dinner by Dan Kennedy
9-12
Use of sliders from graphing functions to science activities adds a dynamic element to student investigations and deepens understanding.
Studies show that guided discovery is an effective method of instruction for increasing and deepening student understanding. Many graphing utilities support the insertion of sliders “on the fly,” and quickly guide students to discoveries like: the slopes of horizontal and vertical lines, the relationship between the slopes of parallel and perpendicular lines, the sum of the measures of the interior angles of a triangle, or the effect of launch angle on the range of a projectile.

D27: Calculus Live: Activities for ALL Ages and Stages by Deb Hughes Hallett
6-12, Community College
This session with demonstrate activities to build intuition about the concepts underlying calculus. These activities can used by students in middle school as well as in AP Calculus, where we investigate the Fundamental Theorem of Calculus.

D28: Mathematical Theory Construction by Madhav Kaushish
6-12
There are two broad categories of activities Mathematicians engage in: problem solving and theory construction. It is unfortunate that most people have never experienced the latter. In fact, most undergraduate math majors haven’t either. The goal of this session is to present examples of activities involving theory construction which middle school, high school and/or undergraduate students can engage with. These examples will hopefully give you reason to believe that the clear and rigorous thinking involved in theory construction is something which would benefit any student engaging in the activity. If there is time, we will contrast mathematical theories with scientific and moral theories.