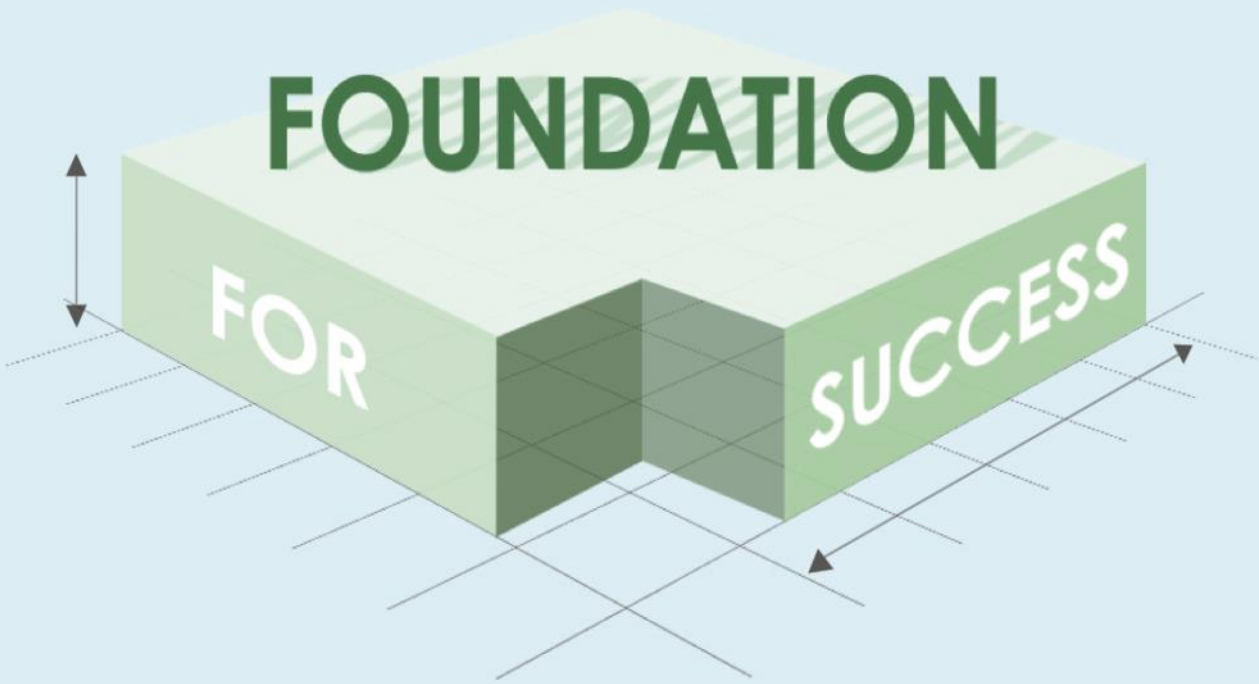
2016

# Illinois Math and Science Conference

OCTOBER 7-8, 2016

PEORIA, IL

# LAYING THE FOUNDATION FOR SUCCESS



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**Illinois Council of Teachers of Mathematics**

and the

**Illinois Science Teachers Association**

**Conference Sponsor**

Helping Students “Grow Up Great”

# Notes

# ISTA/ICTM 2016 Conference

# General Schedule

# Peoria, IL

## Thursday, October 6, 2016

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|---|---|---|
| 6:00 p.m.—9:00 p.m. | ICTM Registration | Conference Center Lobby |

## Friday, October 7, 2016

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| 7:30 a.m.— 4:30 p.m. | Registration | Conference Center Lobby |
| 8:00 a.m.— 4:00 p.m. | Exhibitors | Exhibit Hall A |
| 8:30 a.m.— 11:20 a.m. | Concurrent Sessions | Conference Center/Marriott |
| 9:00 a.m.— 11:20 a.m. | ICTM Keynote Speaker | Marriott Marquette Ballroom |
| 11:30 a.m.—12:50 p.m. | Lunch | Exhibit Hall C |
| 1:00 p.m.— 4:50 p.m. | Concurrent Sessions | Conference Center/Marriott |
| 2:00 p.m.— 3:50 p.m. | ISTA General Session | Marriott Marquette Ballroom |
| 4:00 p.m.— 4:30 p.m. | Exhibitor Reception | Exhibit Hall A |
| 5:15 p.m.— 7:00 p.m. | ICTM Awards Reception | Marriott Marquette Ballroom |

## Saturday, October 8, 2016

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|---|---|---|
| 7:30 a.m.—11:00 a.m. | Registration | Conference Center Lobby |
| 8:00 a.m.— 8:30 a.m. | ICTM Business Meeting | Marriott Marquette Ballroom |
| 8:00 a.m.— 12:00 p.m. | Exhibitors | Exhibit Hall A |
| 8:45 a.m.— 9:45 a.m. | ICTM Keynote Speaker | Marriott Marquette Ballroom |
| 9:00 a.m.— 2:50 p.m. | Concurrent Sessions | Conference Center |
| 12:00 p.m.—1:00 p.m. | ICTM Past Presidents' and Affiliate Luncheon | |
| 1:00 p.m.— 2:00 p.m. | Poster Session | Conference Center Lobby |
| 1:00 p.m.—2:20 p.m. | IMTE Business Meeting | Room 402 |
| 3:15 p.m.— 4:00 p.m. | ICTM Conference Advisory Meeting | |

**Keynote Speaker:** Douglas Clements, Douglas.Clements@du.edu
Friday 9:30 – 11:20 Marquette Ballroom
Title: The Early Years Lay the Foundations for Success:
The Surprising Importance of Early Math
Twitter: @DHClements

**Abstract:** What are the building blocks that lay the foundation for mathematical success? They are formed in the earliest years. Learn about five surprising research findings about early mathematics, including its predictive power, children's math potential, educators understanding of that potential, the need for interventions, and what we know about effective interventions.

**Biography:** Dr. Douglas Clements is a Kennedy Endowed Chair in Early Childhood Learning, a Professor, and the Executive Director of the Marsico Institute of Early Learning and Literacy at the University of Denver. Previously a kindergarten and preschool teacher, he has since conducted research and published widely in mathematics education. He is an author on over 135 refereed research studies, 23 books, 90 chapters, and 300 additional publications. He was a member of President Bush's National Math Advisory Panel, and a member of the National Research Council's Committee on Early Mathematics. He helped develop the Common Core State Standards committee of the National Governor's Association and the Council of Chief State School Officers, writing national academic standards and the learning trajectories that underlie them.
Visit Dr. Clements on the web at http://www.researchgate.net/profile/Douglas_Clements/ or https://portfolio.du.edu/dclemen9

**Keynote Speaker:** Matthew Larson mlarson@nctm.org
Saturday 8:45 – 9:45 Marquette Ballroom
Title: Overcoming Obstacles to Make Mathematics Work for Each Student!
Twitter: @mlarson_math

**Abstract:** In order to raise the achievement of each and every student we must overcome the obstacles that have traditionally stood in the way of this goal. This session will engage participants in examining the six principles of highly effective mathematics programs as outlined in NCTM's document Principles to Actions, look at the action steps necessary to overcome these obstacles, and offer strategies for how we can better communicate to parents and other stakeholders what meaningful mathematics learning looks like today and why it is important.

**Biography:** Matt Larson is president of the National Council of Teachers of Mathematics (NCTM), a 70,000-member international mathematics education organization. Previously, Larson was the K–12 curriculum specialist for mathematics in Lincoln (Nebraska) Public Schools for more than 20 years. He is an Adjunct Professor in the Department of Mathematics at the University of Nebraska-Lincoln. Dr. Larson began his career in education as a high school mathematics teacher. He has authored or co-authored several books, including a series on professional learning communities and Common Core Mathematics. He is co-author of *Balancing the Equation: A Guide to School Mathematics for Educators and Parents,* and he was on the writing team of *Principles to Actions: Ensuring Mathematical Success for All* (2014). He is the co-author of a widely used K-12 mathematics series. Larson has taught mathematics at the elementary through college level and has held an appointment as an honorary visiting associate professor at Teachers College, Columbia University.

**Luncheon Speaker:** Seth B. Darling
Friday 11:30—12:50 Marquette Ballroom
Title: The End of Water As We Know It

**Abstract:** We are witnessing the end of the golden age of water. Freshwater was once abundant, cheap, and safe for humans, but that is changing rapidly. Couple that with the fact that over the next 35 years, the world's demand for water will rise by 55 percent, and it's no wonder that water technology and management figure to shape the 21st century much like oil conflicts influenced the 20th century. So how can we reshape a better future for water? In his talk, Dr. Seth Darling will discuss how we got to this point, what lies ahead, and what can be done now to respond and adapt.

**Biography:** Seth B. Darling is a Scientist at Argonne National Laboratory and a Fellow at the Institute for Molecular Engineering at the University of Chicago. After receiving his Ph.D. from the University of Chicago in physical chemistry, he came to Argonne as the Glenn Seaborg Distinguished Postdoctoral Fellow in the Materials Science Division. Following his postdoc, Dr. Darling joined the Center for Nanoscale Materials at Argonne as a staff scientist. His group's research is motivated by humankind's grand challenges and centers around molecular engineering with a particular emphasis on solar energy and water treatment. Dr. Darling has published over 100 papers and a popular book on climate change, holds several patents, and lectures widely on topics related to energy, climate, and water.

**Keynote Speakers:** Dr. Brian Reiser, Michael Novak
Friday 2:00—3:50 Marquette Ballroom
Title: Developing Coherent Storylines of NGSS Lessons

**Biography: Brian J. Reiser** is a professor of learning sciences at Northwestern University. Dr. Reiser's research examines how to make the scientific practices of argumentation, explanation, and modeling meaningful and effective for classroom teachers and students. Reiser co-led the development of IQWST *(Investigating and Questioning our World through Science and Technology)*, a three-year middle school curriculum that supports students in science practices to develop disciplinary core ideas. Dr. Reiser is a member of the National Research Council's Board on Science Education. He has served on the NRC committees authoring the reports *A Framework for K-12 Science Education* (which guided the development of the Next Generation Science Standards), *Developing Assessments for the Next Generation Science Standards,* and *Guide to Implementing the Next Generation Science Standards*. Dr. Reiser has also worked with Achieve on tools to help states implement NGSS. Dr. Reiser is currently collaborating with several state initiatives to design and provide professional development and develop curriculum materials for K-12 teachers to support them in realizing the reforms in NGSS in their classrooms. Dr. Reiser earned his Ph.D. in cognitive science from Yale University.

**Biography: Michael Novak** is a 7th and 8th grade middle school science teacher at Park View School in Morton Grove IL. He is Adjunct Faculty at Northwestern University, teaching courses in science methods and instructional materials design. He is a 2014 Golden Apple Fellow and National Board Certified teacher, who has taught science, mathematics, and social science in grades 6-8 for over 18 years. He has authored instructional units and computational models for high school science classrooms though the *Center for Connected Learning* at Northwestern University for the past 10 years, and has worked with partnerships in multiple states to develop NGSS-aligned curriculum materials. Michael is also a facilitator and member of the design team for the *Next Generation Science Exemplar System for Professional Development (NGSX) [ngsx.org]*, a web-based professional development system designed to help educators grow in their understanding of three-dimensional learning. And he is a senior curriculum developer of storylines and related curriculum design tools through the *Northwestern Storylines Project.*

# Science Awards

Golden Apple

Congratulations to the **2016 Golden Apple Award** science recipients! In May, **Golden Apple** honored outstanding teachers at the 31st Annual Golden Apple Awards for Excellence in Teaching & Leadership. Watch featured videos, hear students and teachers talk about the impact of these educators, and learn more about our honorees by visiting: **www.goldenapple.org**

***Jason Crean***
*Lyons Township High School*

***Jeff Grant***
*Downers Grove North High School*

***Todd Katz***
*Whitney M. Young Magnet High School*

***Sherri Rukes***
*Libertyville High School*

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Congratulations to the **2016 Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)** Finalists. This award is the nation's highest honors for teachers of mathematics and science (including computer science). Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education. Please visit **www.paemst.org** for more information.

***Gretchen Brinza***
***Science***
***Alcott College Prep, Chicago Public Schools***

***Marcy Buchanan***
***Science***
***Northwood Middle School, Woodstock***

***Shalonda Carr***
***Science***
***Martin Luther King School, Urbana***

***Reginald Duncan***
***Math***
***Wingate Elementary School, Shiloh***

***Michael Johnson***
***Science***
***Fairview South School, Skokie***

***Andrew Russell***
***Science***
***Disney School, Chicago Public Schools***

***Theresa Sanders***
***Math***
***Roosevelt Middle School, River Forest***

***Howard Templer***
***Math***
***Oak Terrace School, Highwood***

***Bess Thompson***
***Math***
***Lincoln Elementary, Macomb***

***Sarah Wippman***
***Math***
***Westmoor School, Northbrook***

***Congratulations to the 2014-2015 PAEMST awardees who were recognized in Washington, DC this year!***

***Catherine Ditto***
*Burley Elementary School*

***Lisa Nicks***
*Thornton Township High School*

***Jim O'Malley***
*Thomas A. Edison Elementary*

***Mike Fumagalli***
*East Leyden High School*

# Congratulations to the 2016 ICTM Award Winners

Illinois Promising New Teacher of Mathematics Award
**Ben Hyman**
*Walter Payton College Prep*

Excellence in Elementary Mathematics Teaching Award
**Reggie Duncan**
*Wingate Elementary School*

Excellence in Middle School Mathematics Teaching Award
**Emily Weber**
*Joseph Arthur Middle School*

T. E. Rine Secondary Mathematics Teaching Award
**Bill Roloff**
*Lake Park High School*

Max Beberman Mathematics Educator Award
**Andy Isaacs**
*UChicago STEM Education at the University of Chicago*

Fred Flener Award
**Richard Rukin**
*Evanston Township High School (retired)*

Lee Yunker Mathematics Leadership Award
**Jennie Winters**
*Lake County ROE*

The Distinguished Life Achievement in Mathematics Award
**Steve Viktora**
*New Trier High School*

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## ICTM 2016 SCHOLARSHIP AWARDEES

Mackenzie Becherer, Illinois College

Theodora Neofotistos, University of Illinois at Urbana-Champaign

Katina Tole, Loyola University Chicago

Katie Yan, University of Illinois at Urbana-Champaign

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# Presidential Awards for Excellence in Mathematics and Science Teaching

## CALL FOR NOMINATIONS

The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the highest honors bestowed by the United States Government specifically for K-12 mathematics and science teaching. Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education. Since 1983, more than 4,400 teachers have been recognized for their contributions to mathematics and science education. Up to 108 teachers are recognized each year. Presidential Awardees receive a citation signed by the President of the United States, a trip for two to Washington, D.C. to attend a series of recognition events and professional development opportunities, and a $10,000 award from the National Science Foundation.

### WHO CAN NOMINATE?

Anyone—principals, teachers, parents, students, or members of the general public—may nominate exceptional mathematics and science (including computer science) teachers.

**NOMINATION DEADLINE**
**April 1, 2017**

### WHO CAN APPLY?

Secondary school teachers (7th-12th grade) can apply this year. Elementary school mathematics and science teachers (K-6th) will be eligible to apply during a future cycle.

**APPLICATION DEADLINE**
**May 1, 2017**

**TO NOMINATE OR APPLY, VISIT:**
**www.paemst.org**

The National Science Foundation administers PAEMST on behalf of The White House Office of Science and Technology Policy.

Congratulations to the winners of the

# 2016 Illinois STEM Educator Award!

## K-5 Winner

**Carrie Wilson Herndon**

Metro East Montessori School
Granite City, Illinois

## 6-8 Winner

**Jennifer Smith**

Monticello Middle School
Monticello, Illinois

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Congratulations to the winners of the

# 2016 Illinois STEM Educator Award!

## ETA hand2mind® wants to put STEM in every classroom in Illinois!

As the proud sponsor of the Illinois STEM Educator Award, we are excited to fund the $2,500+ prizes for two Illinois educators.

Don't miss your chance to win next year -- be on the lookout for 2017 application details!

ETA hand2mind

**Empowering hands-on learning for**
Science, Math, Literacy, Technology, Engineering

P0816XX44
800.445.5985
**hand2mind.com**

# Friday, October 7, 2016

## 8:30 a.m. – 9:20 a.m. Concurrent Sessions

**STEM and Storytelling: Parallel Plotlines** **Room 134** **Elementary**

Both provide opportunities for practicing skills such as sequencing and prediction. In this session we'll explore the elements of "story" and their parallels to STEM in the classroom, and then discuss the publication process for aspiring authors.

*Presenter:* *Ruth Spiro*

**Everything Moves!** **Room 135** **General/Physics**

Finding ways to build understanding with Physics can take a lot of time. Air tracks Dropping objects, viewing and measuring waves can all be investigated in much greater detail with the use of simulations! GIZMOS is the largest collection of online simulations for all the sciences!

*Presenter:* *Thom O'Brien, Explore Learning*

**Family STEM Event Tinkerlab** **Room 136** **General**

Plan a successful Family STEM Event. We will discuss the logistics of space, materials, staffing, family connections and cost. Next, get hands-on with: balloon cars, spinning toys, air blasters, and paper tape circuits. We will learn about sharing the engineering design process with families and ideas for increasing parent involvement.

*Presenters:* *Becky McDowell, Beth Nelson, Barrington 220*

**Anatomy and Physiology Techniques and Activities** **Room 200** **High School/Biology**

This workshop will highlight modeling, individual and group activities, games, and pro jects that appeal to a variety of learning styles and abilities.

*Presenter:* *Sylvia Tufts, retired - Thornton Twp. District 205*

**Mission Possible: NGSS-Aligned Geoscience Storyline** **Room 201** **General/Earth Science**

Looking for a way to use anchoring phenomena to drive instruction? Wondering how storylines and coherence can lead to three-dimensional classrooms? Join us to learn how sequencing learning experiences helps students construct explanations about geoscience processes that have changed Earth's surface. Includes a summative assessment and completed storyline!

*Presenters:* *Emily Mathews, Rebecca Garelli, Misty Richmond*
*DePaul University/Chicago Public Schools*

**Genetics: Crazy Traits and CPO's LINK Learning Module** **Room 203** **General/Biology**

CPO's Crazy Traits learning module uses STEM and NGSS strategies in a real-time tablet-based learning environment to learn genetics. Concepts like traits, alleles, phenotypes, genotypes, and heredity will come alive as you create crazy creatures with a unique kit and study probability, adaptation, dominance, and recession.

*Presenter:* *Vince Zaccardi,, Frey Scientific & CPO Science*

**Using Data to Tell a Biological Story** **Room 209** **General/Biology**

There is an increasing need for biology students to have a strong foundation in quantitative approaches to data analysis. In this session participants will learn how to scaffold and differentiate their instruction when having students analyze and manipulate data and perform statistical analyses in order to tell a biological story.

*Presenter:* *Jennifer Pfannerstill, North Shore Country Day School*

**STEM Integration via Problem Based Learning** **Room 210** **High School/General**

A Problem Based Learning (PBL) unit was piloted in 10th grade urban STEM classes as a basis for integrating and creating connections between disciplines. Teacher perspective of challenges, planning, and benefits of a PBL model will be shared as well as student feedback and suggestions for implementation.

*Presenters:* ***Miriam Schmid, William Reed, Michael Schroers, Gwendolyn Brooks College Prep***

**Integrating Chromebooks with Vernier Technology** **Room 211** **Middle/General**

Learn how to use Chromebooks with Vernier technology in a workshop featuring experiments from Vernier lab books. See how engaging experiments like Boyle's Law or Grip Strength Comparison teach students about data collection and analysis practices that promote science inquiry and boost test scores.

*Presenters:* ***Angie Harr, Michael Crofton, Vernier Software & Technology***

**Using the 5E's to Teach the Next Generation Science Standards** **Room 212** **General**

We will be presenting our 5E model unit plan. We will provide a detailed explanation of each of the 5 components of the unit plan and provide a sample unit we designed using NGSS including all assessments. We will also provide work time for attendees to begin mapping out an upcoming unit of study and answer questions.

*Presenters:* ***Catherine Boland, Sean Gormley, McCracken Middle School, Skokie, IL***

**HHMI Presents Human Skin Color** **Room 213** **High School/Biology**

HHMI has produced a short film and supporting activities on the evolution of human skin color. The content connects to key concepts in biology, human biogeography, genetics, and anatomy/physiology and evolution. The focus is on the evolutionary pressures of UV radiation on DNA, folate degradation, and vitamin D synthesis.

*Presenters:* ***Kathy Van Hoeck, Jason Crean, Michelle Koehler, York Community High School, Elmhurst***

**Science Just Got Real! How to Bring NGSS to Life in Your Classroom!** **Room 218** **General**

Phenomena? Science and Engineering Practices? Three-Dimensional learning? Cross-cutting concepts? What does it all mean, how do they work together, and how do I start to bring these ideas and the Next Generation Science Standards into my classroom? If you have any of these questions, this presentation will highlight valuable resources and tools, along with professional learning available-at little to no cost-to support you on your science journey.

*Presenter:* ***Aimee Park, Foundational Services for Science***

**Microscopy in The Biology and Physics Classroom** **Room 220** **High School/Biology**

Are your high school students interested in both biology and physics? A career in the fields of biophysics and bioengineering may be just the right fit for them! Please join us for a brief discussion of career opportunities led by members of the Biophysical Society Education Committee. You will take home materials for a microscopy lesson aligned to physics, biology, and engineering content standards as well as a wooden microscope from Echo Laboratories.

*Presenter:* ***Sharlene Denos***

**Darkling Data: Analyzing Beetle Behavior with Ethogram** **Room 221** **General**

Delve deeper into the Science and Engineering Practices by observing live Darkling Beetles. Learn to use ethograms (tally charts) to collect data on living organisms. Use NGSS Science and Engineering Practices, basic statistics and graphing to analyze behavioral data. Brainstorm ways to authentically collect data in the natural world.

*Presenters:* ***Brendan O'Handley, Chicago Academy of Sciences/Peggy Notebaert Nature Museum***

**Moving Towards the NGSS: Peoria High** **Room 222** **General/Physics**

Peoria High School has devoted significant time and money to support teachers in adjusting to the next Generation Science Standards (NGSS). Our experiences have provided a number of lessons that teachers and administrators can use as their own schools work towards implementation of the NGSS.

*Presenter:* ***Joel Morton, Peoria High School***

**Data Collection with Arduinos** **Room 402** **General**

Discover how to can bring engineering practices into any classroom by using sensors along with Arduinos. You will get hands on with an Arduino and the Ardusat Space Board sensor to build projects and science experiments using real data collected from sensors.

*Presenters: Ben Neiswender, Jeff Couch, Ardusat*

**Student Misconceptions of Intermolecular Forces in Solubility** **Room 403** **College/Chemistry**

Solubility is a surprisingly nuanced concept, and, not surprisingly, is difficult for students to explain using the concept of intermolecular forces. In this session I will describe a discrepant event for solubility and my analysis of the misconceptions student have in explaining it.

*Presenter: Kathryn Rowberg, Purdue University Calumet*

**Mystery Story-line Leads to a Driving Question** **Room 404** **General**

How can a teacher use a story-line to engage and build curiosity toward developing and supporting a Driving Question? This session will give you an authentic story-line to implement 3-dimensional learning for students through a murder mystery that truly has no answer. MS-LS1-3, Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells is the performance expectation being addressed using IQWST, "What's going on inside my body?" as an example of our district's newly adopted middle school science curriculum. Come and join us for the mystery!

*Presenter: Aaron Mueller*

# 9:00 a.m.-11:20 a.m.

**ICTM Keynote Speaker** **Douglas Clements** **Marriott Marquette Ballroom**

What are the building blocks that lay the foundation for mathematical success? They are formed in the earliest years. Learn about five surprising research findings about early mathematics, including its predictive power, children's math potential, educators understanding of that potential, the need for interventions, and what we know about effective interventions.

# 9:30 a.m.—10:20 a.m. Concurrent Sessions

**The F-IO Physics Curriculum: Issuing Digital Learning Technologies to All Students on a 1-to-1 Basis in a Flipped Physics Classroom** **Room 134** **General/Physics**

Could the ubiquitous use of versatile, hand-held digital sensors transform physics education in the same way that graphing calculators transformed mathematics education? This three-year action research study investigates flipped physics classrooms and the use of digital learning tools both in-class and in students' everyday lives and experiences.

*Presenter: Christopher P. Cunnings, Millikin University*

**Bricks, Puzzles and the Alphabet = Understanding Chemistry, Part 1** **Room 135** **High School/Chem**

Using simple DuploTM bricks, students see the various manners bonds can form between carbon atoms and decipher which results in greater stability for a molecule, the linear, wall or ring form. A jigsaw puzzle and the alphabet are used to illustrate enzyme specificity.

*Presenter: Suzanne Cunningham, Purdue University*

**Design, Test, and Optimize Air Blasters** **Room 136** **General**

Explore the Engineering Design Process as you Imagine, Plan, Make, Test, and Improve your own air blasters. Discover the parallels between the engineering design process and other content areas while digging deep into the NGSS Science and Engineering Practices.

*Presenters: Becky McDowell, Beth Nelson, Barrington 220*

**Glaciers-Traveling Time Capsules** **Room 200** **General/Earth Sci**

This presentation highlights the presence of glaciers in the Americas and Antarctica with emphasis on Patagonian and Alaskan Glaciers. Glacier types, composition, and glacial movement advances and retreats will be described. Participants will identify glacial types as well as observe examples of moving and calving glaciers in action.

*Presenter: Sylvia Tufts, Retired - Thornton Twp. HS District 205*

**Environmental Science Activities for Your Classroom** **Room 201** **General**

This session will feature an environmental potpourri. We will examine activities from programs such as GUW (Growing Up WILD), PLT, WET, and WILD. Learn how these programs can be used in both science and math plus STEM. The new PLT module Focus on Forest plus Southeastern Forests and Climate Change will be previewed.

*Presenter: Don Powers, Western Illinois University*

**nano@illinois Research Experiences for Teachers** **Room 202** **General**

The nano@illinois RET program contributes to developing a diverse STEM workforce. Past participants' summer research experiences, professional development activities in nanoscale STEM fields, and module development are highlighted. The nano@illinois RET is managed by the University of Illinois Center for Nanoscale Science and Technology, and is funded by NSF. http://nano.illinois.edu.

*Presenters: Carrie Kouadio, Irfan Ahmad, Xiuling Li, Lynford Goodard, U of I Urbana*

**Students Driving Real Citizen Science** **Room 203** **General**

Lil Ms. Atrazine, Operation Endangered Species and the P2D2 Program. Want your students be a part of real scientific study monitoring water quality? Would you like to have them raise a regionally extinct species in your classroom? Wish them to be the solution to global epidemics surrounding pharmaceuticals, chemicals and more? This session is for you. Working with real scenarios like LMA, OES and the P2D2 program students naturally become adaptive learners and global thinkers. These students developed programs engage kids by allowing them to be the solutions to real world environmental problems. Your students become the agents of change.

*Presenters: Paul Ritter, Jennifer Carey, Pontiac Township High School*

**Back to BINGO for Bio Vocab** **Room 209** **High School/Biology**

From BINGO to Memory, to picture puzzles, students will learn about photosynthesis, cellular respiration, complementary base pairing, antiparallel strands and amino acid sequences. Application of these techniques can be used for a variety of other topics as you see fit! We will be making our own ready-to-use tools in the classroom!

*Presenter: Emily Drown, Morgan Park Academy*

**Engineering Solutions for a 3D STEM Classroom** **Room 210** **General**

Bringing the Engineering Design Process into your classroom ensures 3D learning is occurring by allowing students to build deeper understanding as they grapple with making sense of phenomena and find solutions to problems. Join us for this interactive, engaging, and hands-on session where the EDP is investigated using collaboration and consensus.

*Presenter: Michele Cozza, Accelerate Learning/Rice University*

**Teaching the GOOGLE Generation: How to Create Authentic Assessment** **Room 211** **General**

Information is more accessible than ever before. We, as teachers, need to begin to reevaluate our approach to assessment. In this presentation we will explore the spectrum of assessment, and it's purpose in our classroom. We will also look at some examples of assessments, from student samples to rubric design.

*Presenters: Laurel Darby, Zach Heald, Rock Falls Middle School*

**Fun Science Activities for the Entire Class** **Room 212** **Middle School/General**

These activities are fun, work with all students, and lets them practice being scientists. They are easily adapted to match students' abilities. The NGSS three-dimensional approach to instructional planning will be highlighted. While the focus is on classroom use, a little planning could create a grade-level or entire-school science day!

*Presenters: Natalie Keigher, Jim Grant, Illinois Science Olympiad*

**HHMI Rock Pocket Mouse** **Room 213** **High School/Biology**

HHMI has produced a short film and supporting materials that has quantified the selective pressure of predators on rock pocket mouse evolution and identified the genes involved in adaptation. Pocket mice show us how random changes in the genome can take many paths to the same adaptation—a colored coat that hides them from predators.

*Presenters: Michele Koehler, Jason Creen, Kathy van Hoeck, Riverside Brookfield High School*

**NGSS in Middle School with IQWST** **Room 218** **Middle School/General**

Come engage in a sequence of investigations where middle-school students experience phenomena, construct explanations, and argue from evidence. Teach students to think like a scientist as they apply a claim, evidence, reasoning framework to make sense of investigations.

*Presenter: Aimee Park, IQWST*

**Three Dimensional Learning for Early Childhood Learners** **Room 220** **General**

This presentation will provide an example of how to use NGGS and three dimensional learning for K-2 learners. Young children are natural at science from birth. This inquisitiveness and curiosity is so active in early childhood years that more attention needs to be focused on their innate desire for science before they lose interest in it.

*Presenter: Dr. Abha Singh, Western Illinois University*

**Old Materials, New DCIs: Teaching NGSS** **Room 221** **General**

Feeling squirrely about the NGSS Disciplinary Core Ideas? Repurpose materials you already have to address DCIs at your grade level (K-12). Practice developing lesson ideas and guiding questions using authentic museum specimens and everyday materials. Learn about the Project Squirrel citizen science project and data collection opportunities.

*Presenters: Stephanie Sidaway, Peggy Notebaert, Chicago Academy of Sciences*

**Fever 1793: An Interdisciplinary Unit** **Room 222** **General**

What effect do pathogens have on humans? This biology thematic unit on disease, centering around the book Fever 1793 by Laurie Halse Anderson, can be used to teach across different curricular disciplines such as ELA, Science, and Social Studies, incorporating CCSS, NGSS, and C3 standards.

*Presenter:Laura Riley, NBCT, Westmont Junior High CUSD201*

**The Making of a Case Study: San Gerardo de Dota, a Model for Sustainability** **Room 401** **General/Biology**

Presenters traveled to Costa Rica, recorded interviews and trails of the valley of San Gerardo de Dota to document the role of an American biology professor and wife in helping transform one family's dairy farm into a model for sustainability. How the study was written and part of the case will be presented.

*Presenters: Aggie Veld, Emilie Janes, Olivet Nazarene University*

**Establishing Community Partnerships to Foster STEM Engagement** **Room 402** **General**

The Economic Development Council of McLean County, State Farm Insurance and District 87 and Unit 5 partnered to enhance the STEM efforts for teachers and students in the community. With the need for skilled STEM workers, McLean County is committed to this effort benefiting students, future jobs and the community.

*Presenters: Ashley Petrinec, Kevin Reeves, State Farm*

**STEM-ing Up Your Curriculum** **Room 403** **General**

What does a STEM based unit look like? How do we take stand-along classes and fully integrate them into a blended learning experience? In this session, we will look at designing curriculum materials that combine disciplines that allow students to explore and answer questions using OER tools and technologies.

*Presenters: Mike Jones, Helen Brandon, Bloomington Public School District 87*

**Using Web-Based Learning Pages to Engage Students in Inquiry** **Room 404** **General**

An introduction to a variety of lessons that use web-based resources to help a diverse group of students learn content while engaging in scientific practices.

*Presenters: Laura M. Barden-Gabbei, Jamie Matys, Western Illinois University*

# 10:30 a.m.—11:20 a.m. Concurrent Sessions

**S'More Science Success** **Room 134** **General/Phy Sci**

Endless work goes into transforming into a true facilitator of knowledge. This strain can create quite an appetite. There is an exciting new way to satisfy your hunger for professional growth and your sweet tooth simultaneously! The 5 E Model of Instruction offers a template to develop skills as a facilitator of knowledge while savoring the sugary goodness of S'Mores.

*Presenters: Kelly Wulf, Morgan Biel, Aux Sable Middle School*

**Bricks, Puzzles and the Alphabet = Understanding Chemistry; Part 2** **Room 135** **High School/Chemistry**

This lab was developed to introduce high school students to chemical bonds and carbon metabolism in plants. Students become scientists as they use bricks, representing carbon, oxygen and hydrogen, to synthesize glucose, starch and cellulose. Using bricks is a fun way for students to grasp chemical bonds and enzyme specificity.

*Presenter: Suzanne Cunningham, Purdue University*

**Scientific and Mathematical Thinking Across the Curriculum** **Room 136** **Elementary**

Everyday life doesn't always come neatly packaged as a science or math problem. How can other subject areas provide opportunities for engaging in scientific and mathematical thinking? Explore ways to provide opportunities for elementary learners to engage in science, engineering, and math, with a focus on these practices.

*Presenters: Liz Lehman, Jen Hellige, Jeanne Di Domenico, University of Chicago*

**Island Ecology Upset** **Room 200** **General/Biology**

This presentation highlights the ecological relationship between the wolf and moose populations at Isle Royal National Park, an island ecosystem. Trends as well as habitat changes that have influenced and continue to influence both the wolf and the moose populations will be discussed.

*Presenter: Sylvia Tufts, Retired - Thornton Twp. HS District 205*

**Student Teaching edTPA in your Classroom** **Room 201** **General**

This session will give junior high/high school teachers, administrators and college students an overview of the performance assessment required during student teaching in Illinois called edTPA. This will include how edTPA incorporates the NGSS and the similarities between edTPA and the Danielson Framework for Teaching.

*Presenter: Margaret Parker, Illinois State University*

**Biological Machines: Bioengineering Activities for the Classroom** **Room 202** **Middle School**

Cutting-edge EBICS research on biological machines for use in health, security, and environment will inspire interest and will be explored through a presentation, hands-on activities, and interactive ethics modules that will engage and excite your students. A variety of teaching resources will be shared with session participants. http://ebics.net

*Presenters: Carrie Kouadio, Brian Williams, Rashid Bashir, Ritu Raman,,Ghazal Naseri Kouzehgaran, U of I Urbana-Champaign, Lizanne DeStefan, Georgia Institute of Technology*

**Google Apps For Science Education** **Room 203** **General**

Attention beginning "Googlers," come learn about user friendly Google Apps for Education that you (and your students!) can use beginning 1st Period on Monday! Introduction and basic explanation of Google Classroom/Docs/Slides/Forms/Drawings will be provided. Additionally, learn how to discover and use powerful Add-ons, Apps, and Extensions.

*Presenter: Michael Pacton , Valley View Community School District 365u*

**Life Doesn't Happen in Chapters** **Room 209** **High School/Biology**

Biology does not happen in chapters. The revision of AP Biology has required considerable effort by teachers to integrate concepts and to make connections between traditionally isolated topics in biology. In this session, participants will learn how to structure an AP Biology course that does not focus on isolated chapters.

*Presenter: Jennifer Pfannerstill, North Shore Country Day School*

**Successful Use of Argumentation in the STEM Classroom** **Room 210** **General**

Skillful argumentation and discourse are practices of scientists and engineers that provide a pathway for success in the future workforce. During this fun - interactive session participants will determine the solution to a problem through collaboration among team members.

*Presenter: Michele Cozza, Accelerate Learning/Rice University*

**Polymers: New Twists on Old Favorites** **Room 211** **High School/Chem**

Enhance and deepen science and math concepts taught in traditionally "fun" polymer labs. Add more scientific processes to make them inquiry-based. CD of information.

*Presenter: Sherri Rukes, Libertyville High School*

**Fun Science Activities for the Entire Class** **Room 212** **General**

Discover fun STEM activities that engage all students and provide practice being scientists. These activities are easily adapted to match students' abilities. The NGSS three-dimensional approach to instructional planning will be highlighted. While the focus is on classroom use, a little planning could create a grade-level or entire-school science day!

*Presenters: Ken Indeck, Val Goldstein, Illinois Science Olympiad*

**Melanin Storyline Support Materials** **Room 213** **High School/Biology**

This session will support the previous 2 sessions on skin color and the rock pocket mouse by presenting the additional support materials used that have been teacher-generated. This will be the third session in a sequence that illustrates the creation of an NGSS storyline.

*Presenters: Jason Crean, Michelle Koehler, Kathy van Hoeck, Lyons Township High School*

**Networking: Building Quality Classroom Science Assessments** **Room 218** **General**

Throughout the state, there have been professional development offerings with both ISTA and the ROE/ISCs regarding Building Quality Classroom Science Assessments. This session is intended for participants to network and share assessments they have generated. Attendees are asked to bring their own samples to share for feedback.

*Presenter: Aimee Park, ISTA*

**Core Energy Science** **Room 221** **High School/General**

Explore the free opportunities available to Illinois science and math teachers, June26-29 2017 at Rend lake Resort. Teachers leave with lesson plans, classroom ready lab equipment, professional development, graduate credit all provided free by IPRB after completing the 3.5 day summer educational program. Participants in this session will investigate the properties and structures of hydrocarbons. Lesson plans are aligned to NGSS and Science / Technical Literacy Standards.

*Presenter: Diane Woolverton, Illinois Petroleum Resources Board*

**Practical Strategies to Implement NGSS in Your Classroom** **Room 222** **General**

This session provides practical strategies, vetted resources, and a deeper understanding of NGSS which allows educators to go back to their classroom and be confident instructors. Understand connections among Science & Engineering Practices, Cross Cutting Concepts, and Disciplinary Core Ideas, and be introduced to strategies that can be implemented today!

*Presenter: Laura Riley, NBCT, Westmont Junior High CUSD201*

**Citizen Science: Taking the Pulse of the Planet** **Room 401** **General**

Citizen science is a way that students and adults can collect and analyze useful environmental data. This data can be analyzed in a class, but is also shared online and used to monitor environmental trends by research organizations. There is something available for classes K-12.

*Presenter: David L. Oldenburg, Rochelle Township High School*

**Science Spotlight: NGSS Lessons & Resources** **Room 402** **General**

Join us as we share our favorite lessons, activities, and online resources for astronomy, biology, chemistry, and more! From classroom activities to problem-based learning scenarios, we will provide a wealth of ideas you can use to target science concepts and skills outlined in the NGSS.

*Presenters: Tracy (Trimpe) Tomm, Cheryl McDaniel, Havana Junior High School*

**Building A Zoo** **Room 403** **Middle School/General**

Learn how three math and science middle school teachers collaborated to create an integrated unit allowing students to be architects, engineers, zoologists, designers, builders, tinkerers, thinkers, etc. Through this unit, students learned and applied their understanding of rational number operations, ratios, and ecosystems to design and build a three dimensional zoo.

*Presenters: Marla Goldberg, Shannon Anderson, Kim Barbaro, The Skokie School*

**After School STEM Club: The Good, The Bad, The Ugly** **Room 404** **General**

Using high school students to help bring STEM and the NGSS to kids in Kindergarten through Fourth Grade in a fun way. We will discuss our successes, failures, and positive aspects of the program as well as provide many of our free projects and ideas for you to use!

*Presenter:* ***Abigail Bradbury, West Carroll High School***

**Code-switching in Mathematics and Science** **Room 405** **General**

Science and mathematics are often grouped together for various reasons, but there are clear differences. Expectations for number usage vary and sometimes we forget about these discipline specific conventions. If we are more aware of these distinctions, we can provide more informed support for students as they traverse the curriculum.

*Presenters:* ***Greta Mitchell Williams, Rebecca ResnickProviso, Mathematics and Science Academy***

# 11:30 a.m.—12:50 p.m.

## Lunch Exhibit Hall C

Keynote Speaker

Dr. Seth B. Darling

**The End of Water As We Know It**

# 1:00 p.m.—1:50 p.m. Concurrent Sessions

**No Child Left Inside: Get Prepared for The Great American Eclipse of 2017!** **Room 134** **General**

On August 21, 2017, a total solar eclipse will be visible in the continental U.S. for the first time in 38 years, with the path of totality crossing the southern partof Illinois, providing a rare and important educational opportunity for local teachers. Learn how to promote educational outreach and "real" eclipse knowledge both in and outside your classroom, while dispelling the myths and fears that can prevent you and your students from observing this truly awe-inspiring event.

*Presenter:* ***Charles Fulco, Chair American Astronomical Society, Education Outreach Committee***

**NGSS in the Flipped Classroom** **Room 135** **General**

This session will review the basics of flipped classrooms. Free technology resources, interactives, and websites aligned to NGSS will be discussed. Classroom tested lesson plans incorporating the use of technology as a means to facilitate the implementation of Cross Cutting Concepts, Scientific Practices, and Disciplinary Core Ideas will be shared.

*Presenter:* ***Jennifer Smith, Monticello Middle School***

**Science Notebooks: Documenting our Thinking and Data from Inquiry** **Room 136** **Elementary**

Teach young scientists to document thinking like professionals! Reflecting on Dr. Anne Reichel's teachings about science notebooks, investigate using science notebooks to help students communicate thinking and ask questions that develop new understandings and inquiries. We will discuss utilizing science notebooks to collect data, assess learning, and make instructional decisions.

*Presenters:* ***Joslyn Katz, Kelly Haradon, Barrington District 220***

**Anatomy and Physiology: Techniques and Activities** **Room 200** **General/Bio**

This workshop will highlight modeling, individual and group activities, games, and projects that appeal to a variety of learning styles and abilities. Participants will receive ready to use resources as well as gain insights that will help them create useful classroom resources tailored for their individual programs.

*Presenter:* ***Sylvia Tufts, Retired - Thornton Twp. HS District 205***

**Strategies to Ensure Success for ALL Students** **Room 201** **General**

All students can learn. Learn how to motivate students and improve instruction through the use of formative assessments, differentiation, foldables, and the Mathematical Practices.

*Presenter: Jen Parisi, Adlai E Stevenson High School, District 125*

**Using Science Olympiad to Meet Your STEM Needs** **Room 202** **General**

Do you want to engage your students in STEM? Discover how Illinois Science Olympiad can assist you. Learn how the Olympiad activities and events can enhance your students' knowledge and skills in science, technology, engineering and mathematics. Learn about organizing an Olympiad team and how your students can be recognized for their accomplishments.

*Presenter: Don Powers, Western Illinois University*

**I just failed a test... Now what?!?** **Room 203** **High School/General**

Without re-teaching, how do we keep students on track with current materials while relearning previous material? Sick of retakes? How can we teach our students new learning tactics to avoid failure in the first place?

*Presenters: Jody Trapani, Amy Koning, Niles North High School*

**Designing Multiple Choice *Questions for* Teaching AND Learning** **Room 209** **General/Biology**

Multiple-choice questions are useful in assessing learning in formative and summative settings and will not only prepare students for summative exams, but also diagnose misconceptions and promote high-level discussions. Participants will write AP level multiple-choice questions, as well as learn how to modify questions for use as a formative tool.

*Presenter: Jennifer Pfannerstill, North Shore Country Day School*

**Understanding Numbers: Let's Get Real!** **Room 210** **Middle/High School**

Foundational to success in mathematics is an understanding of the nature of numbers. We will focus on students' understanding of rational and irrational numbers and introduce participants to resources that uncover common misconceptions or partial understandings about real numbers.

*Presenters: Sandi Henkels, Casey McLeod, Chicago Public Schools*

**Corrosion: Chemistry Made Simple, Relevant and Fun** **Room 211** **High School/Chemistry**

Labs, demonstrations and examples that make reactivity, oxidation/reduction and corrosion engineering exciting, practical and easy to teach and learn. STEM connections and CD of information.

*Presenter: Sherri C Rukes, Libertyville High School*

**Read Math, Write Now** **Room 212** **Elementary/Middle**

Learn simple ways to incorporate read-alouds and literacy into your math classroom. Math booklist will be provided along with a chance to explore picture books, novels, short stories, and writing strategies to incorporate into your math classroom right away!

*Presenter: Tina Reckamp, Barrington Middle School- Prairie Campus*

**Melanin: An exemplar NGSS storyline** **Room 213** **General/Biology**

This session will take teachers through a sample storyline with melanin as the driving phenomenon. Integrated into this phenomenon-driven unit are concepts like DNA, RNA, proteins, gene frequencies, evolution and others that create a cohesive, contextual, three-dimensional unit.

*Presenters: Jason Crean, Michelle Koehler, Kathy van Hoeck, Lyons Township High School*

**Calculus Problems for the Next Generation** **Room 218** **High School**

During the Calculus reform movement, one of the things that really bought me in was the wonderful problems that were being asked. After 25 years I think it's time for a new wave of interesting calculus questions. I have a few, hopefully participants will bring some for us to look at and discuss.

*Presenter: Steven Condie, Illinois Mathematics and Science Academy*

**Argue like a Scientist: A Cross-cultural Study of Developing Students Scientific Argumentation Skills in a Computer-assisted Project-based Learning Environment** **Room 220** **Middle School**

The purposes of this mixed-methods study are to develop a graph-based computer-assisted project-based learning environment and to study the impact of the learning environment on the development of middle school students scientific argumentation skills and science knowledge in the U.S and Taiwan.

*Presenters: Dr. Pi-Sui Hsu, Northern Illinois University, Dr.Meg Van Dyke, O'Neill Middle School*

**Connecting Common Core to Mathematical Concepts Using LEGO Bricks** **Room 221** **Elementary/Middle**

Modeling mathematical concepts using manipulatives has been used as a powerful teaching technique to enhance students' conceptual understanding. This session will demonstrate various mathematical concepts using LEGO bricks aligned to Common Core Standards to develop students' problem-solving skills.

*Presenter:* *Eunmi Joung, Southern Illinois University Carbondale*

**Implementing NGSX in Champaign and Cook Counties** **Room 222** **General**

Hear how Cook County teachers are using the Next Generation Science Exemplar (NGSX) to improve their science teaching practice. In the summer of 2016, U of I Extension in cook County sponsored and facilitated an NGSX study group of fourteen k-12 teachers. In the 9-day extended professional development, they experienced 3-dimensional learning as students, began creating NGSS aligned curricula, and learned various teaching strategies to align their practice with the vision outlined in the NRC Framework for K-12 Education. Teacher participants will describe their NGSX experience and talk about how they are applying what they have learned in their classrooms.

*Presenters:* *Sue Gasper, Meghan McCleary, Barbara Hug, Department of Curriculum and Instruction, Cook County Teachers, U of I Extension-Cook County*

**Putting the FORM in Formative Assessment** **Room 401** **General**

Formative assessment is essential to student learning, but it is not always being used effectively. Practical strategies for utilizing formative assessment strategies in the math classroom will be presented, focusing on four themes: Making it Fun, Organic, Relevant, and Meaningful.

*Presenters:* *Pauline Zdonek, Scott Wold, Stevenson Middle School*

**Using NGSS storylines in Biology** **Room 402** **General/Biology**

This past year the biology team has implemented the NGSS storyline approach to our units. We will describe sample units, provide examples of lessons, and show video clips of the unit in action.

*Presenters:* *Kirsten Mahoney, Veena Kaniualy, Nancy Wolski, York High School*

**Getting to the Core of Problem Solving** **Rom 403** **Elementary/Middle**

Creating a picture of success is easy when you can visualize mathematical concepts. This session will discuss using model drawings/tape diagrams to develop conceptual knowledge and successful problem solving.

*Presenter:* *Glory Jurich-Sarna, Indian Springs School District 109*

**Take Action Its Time To Teach** **Room 404** **General**

Are student behaviors stopping you from delivering your curriculum? Well, it's time to take action and it's Time to Teach. In this session you will be learning how low level behaviors impact learning, stop the delivery of curriculum and disrupt the classroom learning environment. Secondly, using our research based REFOCUS tool to curb low level behaviors by prompt attention and good timing. Time to Teach contains both theory and techniques that can help you manage a wide range of behavioral challenges. Classroom discipline has robbed you of precious time that you need to deliver your curriculum. Restore that loss of time in your classroom by using our simple, fair and mutually respectful Time to Teach, REFOCUS tool.

*Presenter:* *Clint Brown, National Certified Trainer*

**Multiple Representations with Tile Patterns** **Room 405** **Middle/High School**

Learn how to organize information from tile patterns into tables, graphs, and rules; find connections between different representations of the same pattern. You will also explore each representation in further depth and develop efficient ways to go from one representation to another.

*Presenter:* *Amy Rybaczuk, CPM math curriculum*

**Flipped for Mastery for the lower achieving students** **Bradley Room** **Middle/High School**

Do you have students that sometimes just do not get it? We have developed a way to keep these students involved and excited about coming to Math class using technology and Chromebooks in the classroom. We will be demonstrating how a class works and benefits we have seen using this method.

*Presenters:* *Dana Lainio, Samantha Bloomfield, Warren Township High School*

**Data Analysis for All Students: Open Source Software** **Peoria Room** **Middle/High School**

Statistics have a prominent place in our curriculum. What tools are freely available to all students? In this session, we will gather our own data and explore data analysis with desmos.com and r-fiddle.org. Bring an internet ready device if possible!

*Presenter: Jay Hooper, Centennial High School*

**Computer Science for All: Lessons Learned from Mathematics** **Illinois Room** **Elementary/Middle**

The recently passed Every Student Succeeds Act identifies Computer Science as part of a "well-rounded education" that all students should have. Can CS educators learn anything useful from 30+ years of efforts to reform mathematics education? Let's not reinvent the flat tire.

*Presenter: Andy Isaacs, University of Chicago*

# 2:00 p.m. - 3:50 p.m.

## ISTA General Meeting Marriott Marquette Ballroom

**Dr. Brian Reiser, Michael Novak**

**Developing Coherent Storylines of NGSS Lessons**

The session will explore how to develop a coherent storyline for a unit where rather thatn students learning about science ideas, they are motivated by questions arising from phenomena to figure out these ideas and in the process incrementally build explanatory models. We will use two examples. In the middle school storyline example, students build a wave-based model of how vibrations lead to sound. In the high school storyline example, students build an explanatory model of natural selection to explain multiple cases of population change, including emergence of antibiotic-resistant bacteria and behavioral changes in a population of birds in an urban setting.

# 2:00 p.m.—2:50 p.m. Concurrent Sessions

**"Unpacking" and Moving to NGSS** **Room 134** **Elementary**

The Battle Creek Area Mathematics and Science Center is aligning their K-8 science curriculum to the Next Generation Science Standards. Learn how they "unpacked" performance expectations and wrapped learning around phenomena, doing, and making. Experience a lesson and how students learn through three-dimensional teaching.

*Presneter: Nancy Karre, Battle Creek Area Mathematics and Science Center*

**Function Junction: Moving past functions as equations** **Room 135** **Middle School**

Are functions just equations? We discuss the use of functions to represent relationships and decisions when using functions to model situations. We examine strategies for students to make sense of functions using formative assessments and student work to advance students to a deeper understanding.

*Presenters: Lisa Cash, Niloufar (Lily) Nassiri, Audra Kreger, Darwin Elementary*

**Not Just X! –Equivalence, Variables, and CCMS** **Room 136** **Middle/High School**

Equivalence is at the heart of mathematics -and the common core. Explore some approaches and activities to deepen students understanding of equivalence, and not just procedure, from their first introduction to variables and throughout their mathematical careers.

*Presenter: Steven Starr, CPS retired*

**STEM through A Wind Turbine** **Room 200** **General**

The purpose of this presentation is to demonstrate curricular examples, with online resources, for K-12 students (for schools with/without an on-site turbine) and to describe how a Wind Turbine curriculum utilizes STEM concepts for designing solutions for utilizing energy resources.

*Presenters: Dr. Abha Singh, Dr. Robert Mann, Dr. James Olsen, Western Illinois University*

**Practical Classroom Strategies for Empowering Struggling Learners** **Room 201** **Middle/High School**

How can teachers adapt the classroom environment to allow struggling students to experience success in math? We discuss usable classroom strategies that have helped our students to form a positive attitude towards their learning and take ownership of their progress.

*Presenters: Emily Kaffel, Marian Stauder, Champaign Central High School*

**Buying Back Instructional Time Creatively** **Room 202** **Elementary/Middle**

Too many standards not enough hours in the day? Presentation will focus on infusing additional & supporting Common Core Standards (geometry, patterns & measurement) into your math block; creating time to thoroughly delve into major clusters. Video of students engaged in this process will be shared.

*Presenters:* *Kristi Isaacson, Christina Betz-Cahill, Ardmore Elementary School*

**Using the Japanese Abacus to Develop Strategies for Mental Calculation** **Room 203** **Elementary**

This presentation will introduce how to use Japanese abacus apps to teach mental math. Expand your and your children mental calculation skills with this very useful and fun abacus. Bring your iphone or ipad to explore Japanese abacus apps!

*Presenter:* *Cheng-Yao Lin, Southern Illinois University*

**Make Fluency Practice Fun** **Room 209** **Elementary**

During this workshop you will learn some simple and quickly implemented activities to reinforce fluency practice in your elementary classroom. Teacher participation is expected! Activities for all operations will be presented.

*Presenter:* *Denise Brown, Carruthers Attendance Center*

**Fun Geometry That's Good for You, Too!** **Room 210** **Middle/High School**

Come experience my favorite high school Geometry activities. Activities that address the need for more critical thinking skills and are fun for them (and me!) as well. See how to increase their learning without them noticing!

*Presenter:* *Laura Kaplan, Chicago Academy for the Arts*

**Enabling Online Discourse with MathJax** **Room 211** **General**

MathJax is a free tool for displaying correct math notation online. We'll explore how to use MathJax together with LMS tools like online forums to give students opportunities to communicate about math with you and each other. Participants with a laptop or mobile device will be able to try it out.

*Presenter:* *Daniel Jordan, Columbia College Chicago*

**Ask Why, Don't Invert and Multiply** **Room 212** **Middle School**

The CCSM in 6th grade emphasizes developing the meaning the fraction division through con text, but says nothing about how to bridge to efficient computation methods. We will develop an efficient alternative approach that highlights both the meaning of division and important fraction concepts.

*Presenter:* *Peter Wiles, Eastern Illinois University*

**Building with Math** **Room 213** **Middle School**

Are you looking to incorporate geometry tasks into your middle school classroom? Come try some of these ideas with us and then use them with your students.

*Presenters:* *Kevin Voepel, Tammy Voepel, Ferguson-Florissant School District*

**Why do we Count in a Preschool Setting?** **Room 218** **Early elementary**

Developing mathematical thinking in children begins with counting. The presentation offers a rationale and numerous ways for counting in a preschool setting connected to research on brain -development and best practices. Participants will share in engaging experiences to take to their settings.

*Presenters:* *Heljä Antola Crowe, Patricia Nugent, Bradley University*

**Creating Focus, Coherence and Rigor in the Classroom** **Room 220** **General**

To fully engage students in the depth of mathematical learning called for in the Math Standards, educators need powerful tools and resources. Join us as we explore instructional support that brings the shifts and standards to life in your classroom while preparing students for success on the PARCC.

*Presenter:* *Kristen Clegg, Independent*

**Promote Learning with Instant Feedback (& Stay Sane)!** **Room 221** **Middle/High School**

Increase student engagement and improve student understanding by incorporating fun practice activities that give students instant feedback. Practical examples and templates will be shared. Examples include the Dot Game, Domino WS, Coloring, Match, Puzzles, Partner Activities, and Math Libs.

*Presenter:* *Darl Rassi, Olivet Nazarene University*

**Number Talks in High School** **Room 222** **Middle/High School**

After hearing Cathy Humphreys and Jo Boaler, we took the plunge to see if Number Talks with High School students actually works. We are going to share with you our journey and DO a few Number Talks together. You will leave ready to try a #Talk in your classroom Monday morning.

*Presenters:* *Jackie Palmquist, Leslie Penkala, Metea Valley High School*

**The First Week of School** **Room 404** **Middle/High School**

So it's October and maybe you've already run out of activities to promote collaborative learning. Come join us as we learn about and participate in a variety of team building activities that can be used throughout the year!

*Presenters:* *Gary Chu, Tina Nocella, Niles North High School*

**Standards Based Grading from the Inside Out** **Room 405** **Middle/High School**

Let us share how we were able to transform our Algebra 2 grading system into one that reflects student growth. We will discuss practical strategies for how to write standards and assessments that measure growth and spend time discussing opportunities and challenges that arose during our transition.

*Presenters:* *Eva Lange, Steve Soszko, Stephanie Ross, Holly Swansen, Adlai E Stevenson High School*

# 2:00 p.m.—3:20 p.m. Workshops

**Math-tivities for the Middle Grades** **Room 401** **Elementary**

Increase student familiarity in the Mathematical Practices and the Common Core content standards through engaging activities and games. Leave with new ideas to use next week. Be prepared to be very hands on!

*Presenter:* *Karen Meyer, University of Illinois Extension*

**Origami – A Fun Way to Learn Math** **Room 402** **Middle/High School**

In this workshop, we will do origami to learn some geometric concepts. For example, we will prove the Pythagorean theorem and trisect an angle using origami. We will also fold a triangular box and a hexaflexagon.

*Presenter:* *Ann Hanson, Columbia College Chicago*

**Supporting Common Core Thinking in Algebra 1** **Room 403** **High School**

Teachers will explore instructional strategies and activities that engage Algebra I students in deep thinking that reflects the Common Core Mathematical Practices. Strategies and activities focus on perseverance, modeling with mathematics, constructing arguments, and critiquing others' reasoning.

*Presenter:* *Kelsey Clarkson, Peoria High School*

**Understanding Fractions Begins with Geometry** **Bradley Room** **Elementary**

Word problems will be presented that help students to be successful with understanding fractions from K-5. Attendees will write word problems to address Common Core State Standards for their students. Handouts will be provided.

*Presenters:* *Albert Dean Otto, Cheryl Ann Lubinski, Illinois State University*

**Launching a Lesson: Creating Access for All** **Peoria Room** **Middle/High School**

In this session, we will see, share, and brainstorm examples of how to start lessons so all students can find an entry point. Learn how to pose questions and create opportunities that invite your students to participate instead of hiding in their seat.

*Presenter:* *Jill Swissa*

**Math Through Science: Activities for Middle School** **Illinois Room** **Middle School**

We will share a set of classroom-ready activities for connecting middle school mathematics with physical science.

*Presenters:* *George Reese, Jana Sebestik, University of Illinois*

# 3:00 p.m.—3:50 p.m. Concurrent Sessions

**A Conversation with the Golden Apple Fellows** **Room 135** **General**

In this session, attendees will be introduced to the 2016 Golden Apple awardees who teach science. This session is for any attendee and is a panel discussion. Any questions can be asked of the Fellows in order to see what has made them successful in their own teaching. Come learn and share from some of our science education leaders and you may find yourself involved in some of the same initiatives our Golden Apple panel help to facilitate!

*Presenters:* *Jason Crean, Jeff Grant, Sherri Rukes, Todd Katz, Whitney Young*

**Wind Turbine Module from CPO Science : A STEM Approach to Engineering and Design** **Room 136** **General/Phy. Science**

The CPO Science Wind Turbine learning module lets students learn in a tablet-based learning environment and engineer a wind turbine. Students build, test, and revise their designs. We use STEM activities and an NGSS approach, giving students an understanding of how to apply the Engineering Cycle.

*Presenter:* *Vince Zaccardi, Frey Scientific & CPO Science*

**Dig into Plant and Soil Science** **Room 200** **General/ Earth Sci**

Learn more about the science of soil and crop nutrients with Nourishing the Planet in the 21st Century curriculum and other education resources! This workshop will focus on our MS and HS materials and activities. Each participant will walk away with a bag of resources and new ideas!

*Presenter:* *Haley Siergiej, Nutrients For Life*

**Social Justice in the Math Classroom** **Room 201** **Elementary/Middle**

This presentation will assist teachers in helping students to understand the importance of helping others in regard to the tenets of mathematics. How statistics is used on the net and in newspapers as well as understanding of data in the community.

*Presenter:* *Dr. Eileen Quinn Knight, St. Xavier University*

**The Roles of Technology in the Mathematics Classroom** **Room 202** **Middle/High School**

Given the rise of Desmos, GeoGebra, Kahoot, and other tools and software programs, how should we be using technology in our mathematics classrooms? In this session we will discuss specific themes to guide us toward creating learning activities that highlight the strengths of technology.

*Presenter:* *Craig Cullen, Illinois State University*

**Some Interesting Problems. How They Got Interesting** **Room 203** **High School**

I intend to offer several problems, some that I have recently created, that I think are good problems. After we work on one, we will discuss why it is a good problem and I will share thoughts and observations about the creation of the problem.

*Presenter:* *John Benson, Evanston Township High School*

**Teaching Mathematics Using the Japanese Open Approach** **Room 209** **General**

We will discuss the meaning of the "open approach" to teaching mathematics. Then look at some examples and discuss developing detailed lesson plans and assessment of student learning. We will also discuss how the teacher can incorporate the approach in the classroom. Many useful classroom handouts.

*Presenter:* *Jerry P. Becker, Southern Illinois University Carbondale*

**Active Learning Academy** **Room 210** **Middle/High School**

Looking for some new instructional strategies for your room? Then this session is for you! Come ready to participate in strategies that you can use in your own room tomorrow. I will be showing heads up vocabulary, the amazing race, line it up, substitute it, moving bingo and more!

*Presenter:* *Shellie Kamminga, Marengo High School*

**CCSS Statistics: Shape, Center and Spread (Gr. 6 - Alg. I)** **Room 211** **Middle/High School**

We will provide you with great activities for teaching the CCSS Statistics Standards that focus on shape, center and spread of distributions. Designed to better prepare students for the PARCC test, our activities will show the connection between the 6th grade and Algebra I statistics standards.

*Presenters: Julia Brenson, Tina Dunn, Lyons Township High School*

**Five Steps to Creating a Viable Curriculum** **Room 212** **General**

The Common Core curriculum can be overwhelming. Finding meaningful ways to cover all the material is challenging. In this session, you will be given some practical strategies in creating learning targets, designing assessments, and providing feedback to help ensure student success.

*Presenter: Jeff Harding, Mundelein High School*

**Middle Grades Mathematics Formative Assessment Strategies** **Room 213** **Middle School**

Expand your repertoire of formative assessment strategies so you can learn more about your students' mathematical understand while they learn more math. A range of strategies from quick, informal feedback to longer lessons will be discussed.

*Presenter: Rick Anderson, Eastern Illinois University*

**Reaching Diverse Groups of Learners in Algebra** **Room 218** **Middle/High School**

With the CCSSM, student success in algebra has become more challenging. We will engage participants in a discussion about building a collaborative community focused on effective strategies and resources for reaching diverse groups of students, from struggling to confident learners, in algebra.

*Presenters: David Jabon, Faylesha Porter, Alanna Mertens, DePaul University*

**Growth Mindset** **Room 221** **General**

Join us for a discussion on the importance of growth mindset & how to encourage it within our students. We will focus on last year's keynote speaker, Jo Boaler, and her book entitled "Mathematical Mindsets" while discussing tracking, assessments, homework, and grading in the classroom.

*Presenters: Danielle Boggs, George Reese, Carolyn Fox, Franklin Middle School*

**Introducing Implicit Equations to Algebra Students** **Room 222** **High School**

As a result of department conversations with calculus teachers, we made some lessons designed to expose students to implicit equations outside of the unit on conic sections. Come see how we integrated these lessons and utilized technology to show the students what these equations can do!

*Presenter: Michelle Eggerding, Schaumburg High School*

**Creativity and Curiosity in Math and Science Classrooms** **Room 404** **General**

Curiosity and creativity are essential for our society. Unfortunately, we do things everyday that systematically squash these habits of mind. We will discuss three common teacher mistakes that stifle curiosity and creativity, and three alternative teacher actions that help develop them. Curious?

*Presenter: Zachary Herrmann, Harvard Graduate School of Education*

**Using Computation to Define Computational Thinking** **Room 405** **General**

Many have attempted to define computational thinking (CT) and associated learning goals. How can we synthesize this valuable but often disparate work? Teams at UChicago and UIUC are analyzing the landscape of CT research to develop learning trajectories for CT in elementary school.

*Presenters: Andrew Binkowski, Katie Rich, The University of Chicago*

# 3:30 p.m.—4:50 p.m. Workshops

**Counting: Easy as 1, 2, 3?** **Room 401** **Early Elementary**

Counting principles impact number sense including the understanding of mathematical operations, place value, and using mathematical reasoning. Investigate and explore the depth of counting in the common core using the math rack, ten frames, arrow cards, the numeral track, and number path.

*Presenter: Tina Johnson*

**Hunting for Patterns** **Room 402** **Middle School**

We will begin by looking at patterns of geometric figures and then use these to develop algebraic formulas and investigate some of the standards related to expressions and equations and functions. Several examples, with increasing complexity, will be covered during this session.

*Presenters: Tammy Voepel, Kevin Voepel, Southern IL University Edwardsville*

**Humanizing the Mathematics Classroom** **Room 403** **High School**

We will experience activities that will challenge current ways of schooling and provide platforms for meaningful conversations. Participants will also walk away with examples that help create a mathematics classroom where students feel part of a community and responsible for their own learning.

*Presenters: Esther Song, Benjamin Walker, Lindblom Math and Science Academy*

**Fractions! Fractions! Learn All About 'EM!** **Bradley Room** **Elementary/Middle**

We will dive into professional development that increases pedagogical content knowledge while supporting classroom application. Attendees will experience a research-based instructional sequence on fractions designed to improve teachers' content knowledge and practices, and student engagement..

*Presenter: Martha Klingshirn*

**Revamp Your Review Day** **Peoria Room** **General**

Throw out those old, dull review worksheets. Our session will explain alternative protocols to shift how review of content is structured in your class. Using formative assessments incorporated with high-interest activities, you'll make review day a personalized learning experience for your students.

*Presenters: Kelly Rooney, Tyrone Martinez-Black, Evanston/Skokie School District 65*

**Conics–The Ugly Duckling of Algebra 2** **Illinois Room** **High School**

Do you dread teaching conics to your Algebra 2 classes? Do you skip them entirely because they don't seem that important? Come rediscover conics in this interactive workshop that uses paperfolding, simulations, and graphing calculator technology to engage even the most reluctant of learners.

*Presenter: Denise Young, Blue Valley West High School*

# 4:00 p.m.—4:50 p.m. Concurrent Sessions

**Thinking Mathematically in Daily Warm Ups** **Room 134** **Middle/High School**

Engage students in the first few minutes of class with activities that push students to think mathematically about everyday situations. All activities promote the CCSS Math Practice Standards, use technology, promote student ownership, and can be applied to your classroom tomorrow!

*Presenter: Marissa Walczak, Rock Island High School*

**Making Grades Mean Something Using Standards** **Room 135** **Middle/High School**

What does a 90% in a class really mean? Imagine assessing students in ways that encourage student involvement, focusing on skill mastery rather than total points, and communicating with parents. Come see one example of standards based grading in action!

*Presenters: Heather Komac, Joe Jakcsy, Lake Bluff Middle School*

**IMT Journal Reception** **Room 136** **General**

The editors of the Illinois Mathematics Teacher, official journal of the ICTM, invite conference attendees to discuss mathematics, teaching, and article ideas over wine and cheese.

*Presenters: Christopher Shaw, Daniel Jordan, Columbia College Chicago*

**How Can Teachers Get Students to Attend to "Meaning" in Equation and Inequality Tasks?** **Room 200** **Middle School**

Come and join me to learn how to help students to explain and interpret equations and inequalities using mathematical symbols and their solutions based on different tasks that can promote relational understanding.

*Presenter: Deksiyos Desta, Illinois State University*

**Why Teach Precision in a Math Class?** **Room 201** **Middle School**

Join for a discussion about measurement precision. We will share videos and student work as they cope with measurement error and accumulation of error. Leave with research based tasks that you can use in your classroom to help foster your students' understanding of precision.

*Presenters: Jenna O'Dell, Bradley P. Heller, Jeffrey Barrett, Illinois State University*

**Fraction Bootcamp** **Room 202** **Elementary/Middle**

It's no secret fractions are a very difficult concept for students to understand and often difficult for teachers to teach. This session will engage participants in a review of the content, intent, and progression of the ILS, and review effective instructional strategies for teaching fractions.

*Presenter: Kathy Felt, Rock Island School District*

**Average Speed: Arithmetic Mean or Harmonic Mean** **Room 209** **Middle/High School**

Using a technique called extended problem analysis, we will look at two typical average speed problems with an eye towards understanding their underlying connections to the arithmetic mean and the harmonic mean using both analytical and geometrical points of view.

*Presenter: Todd D. Oberg, Illinois College*

**DO-IT-YOURSELF 3-D MODELS** **Room 210** **General**

The student's desktop will become alive with fascinating 3-D models produced by simple paper folding. This will be fun and suitable for all grades. We will count, measure, solve puzzles, and form conjectures. We include the Great Pyramid of Egypt, an anti-prism and a new one called George.

*Presenter: George J. Marino, Aurora Central Catholic*

**Touching Screens or Touching Objects: Which is Better?** **Room 211** **Elementary**

Concrete manipulatives have been used in classrooms for years. Now digital manipulatives are more common. When is it important to use physical manipulatives, and when do digital manipulatives offer advantages? Come and discuss the affordances and costs of touchscreens versus physical objects.

*Presenters: Carla Strickland, Katie Rich, University of Chicago CEMSE*

**Strategies for Increasing Student Agency in the Classroom** **Room 212** **General**

The first part of this workshop analyzes NCTM and NRC definitions of rigor and discusses their relationship to student agency. We argue that student agency plays an interconnected role with mathematical rigor. Tools for incorporating greater student agency at all age levels will be explored.

*Presenters: Karie Brown-Tess, Angela Noelle Lindquist, University of Illinois Urbana*

**7.RP.3 through Tables of Equivalent Ratios** **Room 213** **Middle School**

Participants will learn how tables of equivalent ratios can support student learning throughout all 7th grade ratio and proportions standards. In addition, how to support students to be visible learners.

*Presenters: Christy Vehe, Nicole Sangpeal, Valley View School District*

**Re-Engaging Students to Repair Mathematical Misconceptions** **Room 218** **Middle/High School**

Unfortunately, sometimes we teach, but our students don't learn. How do we uncover and address their misconceptions? We'll explore a structure to respond through "re-engagement" — analyzing students' work and exploring free, rich, high-quality mathematical tasks and supporting materials.

*Presenter: Sendhil Revuluri, University of Illinois at Chicago*

**Number Talks: Developing Computational Fluency** **Room 220** **Elementary**

This session will focus on how to develop computational fluency through daily number talks. Common Core places emphasis on student strategies for solving problems, rather than automaticity. This session will give participants tools to bring back to the classroom to enhance student strategies.

*Presenters: Sara Cabreda, Deborah Harris, Joliet Public Schools District 86*

**What's In A Name?** **Room 221** **Elementary/Middle**

Participants will experience a classroom activity where student names are used to explore many topics and ideas from data analysis and statistics. Students become invested while discussing mean, median, mode, variance, histograms, box-plots, outliers and other important concepts.

*Presenter:* *Bob Mann, WIU*

**Desmos and GeoGebra Updates** **Room 222** **Middle/High School**

Desmos and GeoGebra are the best (free) online math graphing tools. Each having strengths over the other, makes them two complimentary tools for teachers. We'll look at their sharing areas (teacher.desmos.com/; www.geogebra.org/materials/) to see some great (some new) ready-to-use files.

*Presenter:* *James Olsen, Western Illinois University*

**A PtA-MP-SBG Decoder Ring** **Room 404** **High School**

NCTM's Principles to Actions discusses assessment as one of the guiding principles for school mathematics. The Mathematical Practice standards prescribe goals for student behavior, and standards-based grading is a way to assess and document student work. Let's explore: how can the three mesh?

*Presenter:* *Craig Russell, University of Illinois Laboratory High School*

**PARCC Math Updates** **Room 405** **General**

Learn the latest information the when, what and how of the PARCC math assessment from the Illinois representative to the PARCC Math Operational Working Group. You will be able to see what the current news is and what is forthcoming. Time will be provided for a question and answer period.

*Presenter:* *Heather Brown, ISBE*

## 5:15 p.m. — 7:00 p.m.

**ICTM Awards Reception** **Marriott Marquette Ballroom C**

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# Free Summer Program

**Professional Development for Science and Math Teachers, grades 3-12**

## June 19-22 2017

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**Monday:**
Earn 7 ½ Professional Development Hours.

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## Monday Workshop Descriptions

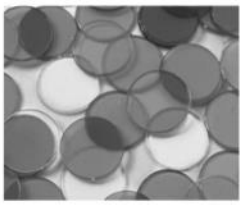
***Elementary Petro Science with Common Core Math Component*** - *Professional Development for Illinois ScienceTeachers*
Understand the process of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems as it relates to the Illinois Crude Oil and Natural Gas Industry. Topics include: Ordered pairs, rock ID, porosity, flow rate of oil, pulleys, oil / water cohesion, crude oil, plastics recycling codes, formation of oil & natural gas, and common core math problems.

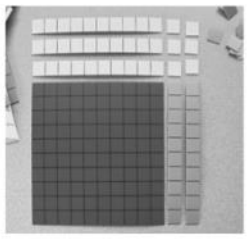
***Middle School Petro Science*** - *Professional Development for Illinois Science Teachers*
Understand the process of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems as it relates to the Illinois Crude Oil and Natural Gas Industry. Topics include: oil & natural gas formation, microorganisms, sound waves, locating crude oil, reservoirs / production, separation process, safety, petroleum-based products, energy conservation.

***Core Energy Math Middle/ High School***- *Professional Development for Illinois Math Teachers*
Understand and utilize Common Core Mathematic standards to define, evaluate and solve real world problems as they relate to the Illinois Crude Oil and Natural Gas Industry. Topics include: Well site clean-up and restoration, directional and horizontal drilling, finding lease locations, oil and natural gas revenue / expenses, and word problems directly tied to a common core standard.

***High School Core Energy Science*** - *Professional Development for Illinois Science Teachers*
Understand the process of scientific inquiry and technological design to investigate questions, conduct experiments and solve problems as it relates to the Illinois Crude Oil and Natural Gas Industry. Topics include: The structure of hydrocarbons, effects of elevation on flow rate, flow rate of a fluid, fractional distillation and a study of bio-remediation. Labs reinforce the major concepts.

# BRIDGES® INTERVENTION



## A NEW K-5 INTERVENTION PROGRAM

Bridges Intervention provides targeted instruction and support, addressing Tier 2 and within the RTI framework. Each volume contains activities, games, and practice pages that can be used for re-teaching key numeracy skills and concepts. Placement and progress monitoring assessments are included.

**To learn more, stop by The Math Learning Center booth or visit**

mathlearningcenter.org/**intervention**

40 YEARS

We're giving away 40 Bridges Intervention sets in 40 days to celebrate our 40th anniversary! Stop by The Math Learning Center booth to enter or visit www.mathlearningcenter.org/offers/drawing.

The Math Learning Center is sponsoring a promotion to enter to win one of 40 Bridges® Intervention sets. You may enter at our booth. Entry is subject to the Official Rules posted at our booth and available at www.mathlearningcenter.org/offers/drawing. You have not yet won. No purchase or payment is necessary to enter or win. Approximate retail value (ARV) of each prize = USD 975. Odds of winning depend on number of eligible entries received. Other restrictions apply.

# Saturday October 8, 2016

## 8:00 a.m.—8:30 a.m.

**ICTM Business Meeting** **Marriott Marquette Ballroom**

## 8:45 a.m.—9:45 a.m.

**ICTM Keynote Speaker** **Matthew Larson** **Marriott Marquette Ballroom**

In order to raise the achievement of each and every student we must overcome the obstacles that have traditionally stood in the way of this goal. This session will engage participants in examining the six principles of highly effective mathematics programs as outlined in NCTM's document Principles to Actions, look at the action steps necessary to overcome these obstacles, and offer strategies for how we can better communicate to parents and other stakeholders what meaningful mathematics learning looks like today and why it is important.

## 9:00 a.m.—9:50 a.m. Concurrent Sessions

**Wright: Materials Science and Algebra** **Room 134** **General/Physical Sci.**

Wright's art glass of the Prairie Style will be examined for mathematical patterns. Once these patterns are identified, students will apply a set of linear functions to create their own unique designs. This hands-on activity integrates art, math, and science for algebra students, grade 7 -10.

*Presenters: Patrick Young, Lindsey Herlehy, Illinois Mathematics and Science Academy*

**Argument-Driven Inquiry: Promoting Science Proficiency by Transforming Lab Activities** **Room 135** **General**

Learn about Argument-Driven Inquiry and how it can help students learn how to use core ideas, crosscutting concepts, and scientific practice to explain natural phenomena.

*Presenters: Victor Sampson, Ashley Murphy, Todd Hutner, University of Texas at Austin*

**BreakOut A Different Kind of Lab** **Room 136** **College**

Looking for a way to highlight teamwork, problem solving, critical thinking, and collaboration skills in your class? Get your students to BREAK OUT! BreakoutEDU creates engaging learning games for ALL learners. Get your students engaged in problem solving and collaboration like never before. Experience a Breakout EDU game and take back the knowledge to your districts! A limited number of discounted kits will be available.

*Presenter: Michael Deleon, Valley View School District 365U*

**Making Claims about Design Solutions to Mother Nature's Wrath** **Room 200** **Elementary**

Investigate structural and material properties then plan and build a structure to minimize hail damage of an apple orchard.

*Presenter: Becky McDowell, ETA Hand2Mind*

**Overcoming Your Fear of Engineering in the Classroom** **Room 201** **General**

Learn how to bring the "E" in STEM to your classroom by adding it to current units or content with what engineers actually do.

*Presenter: Anna Meyer, Maine East High School*

**BioPlastic: Going from Synthetic to Natural Polymers** **Room 202** **General/Chemistry**

Many of the items that we use today are becoming more earth friendly. Learn how a bioplastic is made and what plant materials are used. This inquiry NGSS designed lab activity shows students how all areas of science needs to work together and the importance of a lab notebook. CD with information and activities will be provided.

*Presenter: Sherri C Rukes, Libertyville High School*

**Smiling Faces Do plants and animals eat the same food?** **Room 203** **Middle/Biology**

Iodine is an indicator for starch. Students visualize the digestive process in a demonstration showcasing Digestion in Action. Seeds, saliva and small Petri dishes containing a starch-agar medium are utilized to show students how plants and animals digest food.

*Presenter: Suzanne Cunningham, Purdue University/Agronomy Department*

**STEM Information Literacy in Illinois High Schools** **Room 209** **General**

This presentation will discuss the results of a mixed-methods study, which included surveys, interviews, and budget analysis, investigating how STEM high school instruction addresses information literacy and library research skills. This research was promoted in the exhibits hall at the ISEC 2015 conference.

*Presenters: Kelly Grossmann, Eastern Michigan Univ., Michelle Guittar, Northeastern Univ.*

**Formative Assessment in the Science Classroom** **Room 211** **General**

Formative assessment is a valuable tool for gauging student understanding of science. During this session, a variety of classroom tested, hands on formative assessments for chemistry and biology will be discussed and demonstrated. Suggestions for implementing free online formative assessment programs, such as Socrative and Kahoot will also be discussed.

*Presenter: Jennifer Smith, Monticello Middle School*

**ISTA Elementary Academy** **Room 213** **Elementary**

Quick fixes and long term solutions to implementing NGSS: the elementary academy will show elementary teachers immediate shifts to make, while also introducing teachers to the concept of storylining.

*Presenters: Brian Aycock, Kristin Rademaker, West Aurora SD 129*

**The Sense of Science** **Room 218** **General**

We have all seen the vinegar or Mentos volcanoes, layering liquids, pH color changes and a cell under a microscope. But have you listened, touched, or even tasted (non-toxic only) a science project? Can a person with visual impairment really understand science and maybe even enjoy it? We say YES! Attend our session and find out what you can do to improve the understanding of science in your students.

*Presenters: Barbara French, Gina Carr, Illinois School for the Visually Impaired*

**NGSS Elementary and Middle School Storylines (Part 1)** **Room 220** **Elementary/Middle**

Within this session, a NGSS unit plan for each elementary grade level will be shared. Based on their training and cadre work, elementary teachers will share their experiences and the units in development.

*Presenter: Aimee Park, Lisle CUSD #202*

**Integrating Computer Programming into Collaborative Scientific Argumentation** **Room 221** **General**

We are a team of two researchers and a middle school teacher who planned, developed and implemented a Scratch-based science activity. This activity aimed at engaging grade 7 students in using mathematics and computational thinking practice. The purpose of this presentation will be to share our experience with the audience.

*Presenters: Saadeddine Shehab, Tina Lehr, Maya Israel, University of Illinois at Urbana*

**Investigate Photosynthesis and Cellular Respiration with Algae Beads** **Room 222** **High School/Biology**

Use algae beads in a colorimetric assay to study both photosynthesis and cellular respiration in authentic inquiry investigations (AP Biology Big Idea 2: Labs 5 and 6). Learn how to extend this lab to study the effects of light intensity, light color, temperature and other organisms on these processes.

*Presenter: Mary Clark, Vernon Hills High School*

# 10:00 a.m.—10:50 a.m. Concurrent Sessions

**Caught in a Net? Surface Area Strategies!** **Room 134** **Elementary/Middle**

Join in a discussion on student thinking about surface area. See student work on surface area tasks designed to bring out students' conceptual understanding. Leave this session with tasks that can be used in your classroom immediately.

*Presenter: Pamela S. Beck, Illinois State University*

**High School Math in College: Trends and Approaches** **Room 135** **High School**

Over 1 million college students enroll each year in math classes that do not count towards degree credit and delays their time to graduation. This talk introduces major issues and trends related to these pre-college level math classes and outlines current efforts to accelerate students through them.

*Presenter: Martha B. Makowski, University of Illinois at Urbana-Champaign*

**Math Teacher Circles for the Middle Grades** **Room 136** **Middle School**

Collaborate with colleagues to investigate rich math problems! Find ways to extend your love of learning math at a deeper level to your own students in the middle grades. Learn about a new Math Teacher Circle that recently formed in the south and southwest suburbs of Chicago.

*Presenters: Dave Klanderman, Trinity Christian College*

**Assessments for PERA** **Room 200** **General**

It is the era of PERA, where focus shifts from student achievement to student growth. Participants will discuss similarities and differences between achievement and growth and develop strategies for designing or selecting assessments that monitor student growth.

*Presenter: Jennie Winters, Lake County ROE*

**Using NGSS for Mirroring Assessments** **Room 201** **General/Biology**

We will describe how we redesigned our ecology unit. We will discuss the process we used to unpack the performance expectations. We will explain the integration of the three dimensions into this unit. Finally, we will demonstrate how this process led to the development of our mirrored assessments.

*Presenters: Dawn Myelle-Watson, Angel Cosme, David Wellen, Jefferson High School*

**I'm a PACK RAT! What will I do with all the STUFF!** **Room 202** **High School/Chemistry**

Ever wanted to know what to do with the things you find lying around in your home or at the dollar store, especially in a junk drawer or wonder how can I do this lab cheaper. Learn how to create labs, demos, and activities with such items. Take home CD of activities.

*Presenter: Sherri C Rukes, Libertyville High School*

**FUN = Foods help to Understand Nutrition** **Room 203** **Elementary/Middle**

Who ate breakfast this morning? Which plants were eaten for breakfast? Starch is one of the major nutrients eaten every day. A simple chemistry experiment, identifying starch, leads students to better understand plant biology, the foods they eat, digestion, and balanced nutrition.

*Presenter: Suzanne Cunningham, Purdue University/Agronomy Department*

**Probability Jeopardy!** **Room 209** **High School**

The answers are 2/π, 1/e, and 1/τ. Yeah, but what's the question?

*Presenter: Dane Camp, Elmhurst College*

**Coding in Your Classes** **Room 210** **Middle/High School**

Students have become more familiar with basic coding techniques, in part due to the Hour of Code. In this talk, we will explore ways to extend their understanding using Scratch (or Snap) free coding software to create projects for current algebra, geometry, and pre-calculus classes.

*Presenter: Martin Funk, New Trier High School*

**Teachers challenges with Universal Design for Learning** **Room 211** **Middle School**

Why are the principles of Universal Design for Learning( UDL) are important in teaching science? And what are internal and external factors that inhibit science teachers implementing the principles of (UDL) in their classroom?

*Presenter: Maitha Binjwaeer , SIUC*

**Engaging Parents in the Mathematics Curriculum** **Room 212** **Elementary/Middle**

Parent partnerships are essential to the success of students across the K - 8 continuum. This session will give specific examples for how we have engaged parents in both the CCSS and NGSS standards.

*Presenter: Dr. Steven Shadel, Niles Township District 219*

**ISTA Elementary Academy (Part 2)** **Room 213** **Elementary**

Quick fixes and long term solutions to implementing NGSS: the elementary academy will show elementary teachers immediate shifts to make, while also introducing teachers to the concept of storylining.

*Presenters: Brian Aycock, Kristin Rademaker, West Aurora SD 129*

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Within this session, a NGSS unit plan for each elementary grade level will be shared. Based on their training and cadre work, elementary teachers will share their experiences and the units in development.

*Presenter: Aimee Park, Lisle CUSD #202*

**Accurate Assessment in the Common Core Era** **Room 221** **General**

How can we better measure content mastery? We need to understand the purposes and practical uses of formative and summative assessments. We'll discuss what should and should not "count" as a grade, grading policies, and grade systems in light of Common Core's call for focus, coherence and rigor.

*Presenter: Eric Bright, Charleston Middle School*

**Five Reasons Kids Fail Algebra and What We Can Do About It in Elementary School** **Room 222** **Elementary**

Success in algebra opens doors and expands opportunities in many professions and careers. Unfortunately many students just "don't get it." Why is this? I believe the reason lies in early math instruction – beginning in grades K-3 - where young children fail to build five foundations that support algebraic thinking, and continues into the intermediate grades where cracks begin to form in the foundation. Join me as we explore what teachers can do to ensure their students are building a strong foundation for success in algebra.

*Presenter: Angela Andrews, ICTM Featured Speaker*

**"Unpacking" and Moving to NGSS** **Room 405** **Elementary**

Learn how you can shift your lessons from Inquiry to NGSS using the 5E Learning Cycle with three-dimensional learning. Experience a lesson that takes the learner from observing phenomena, asking questions, gathering information, and solving problems.

*Presenters: Nancy Karre, Kathy Grosso, Battle Creek Area Mathematics and Science Center*

# 10:00 a.m.—11:20 a.m. Workshops

**Laying the Foundation for Area** **Room 402** **Middle School**

Explore the area with origami and dot paper activities to arrive at a formula for the area of any polygon. The conceptual knowledge of area, while including and challenging all students regardless of prior knowledge, will be examined. Problem solving beyond the basic formulas is guaranteed.

*Presenter: Kathleen Fick, Methodist University*

**Writing an Article for the IMT Journal** **Room 403** **General**

The editors of the Illinois Mathematics Teacher will lead a discussion on how to turn innovative teaching ideas into articles for a journal.

*Presenters: Daniel Jordan, Christopher Shaw, Columbia College Chicago*

# 11:00 a.m.—11:50 a.m. Concurrent Sessions

**Subitizing: Beyond the Dots** **Room 134** **Early Elementary**

Subitizing is foundational for math proficiency. Strategies enhancing subitizing structured with 5 and 10 that impacts fact fluency, understanding part/whole, and place value will be explored using finger patterns, ten frames, math racks, and a number path.

*Presenter: Tina Johnson*

**A Math Workshop That Works For You** **Room 135** **Elementary/Middle**

Presentation will include tricks and tools to tackle the workshop concept with efficiency. Focus will be on keeping a mini lesson mini and ways to differentiate without staying up until midnight. Examples from 4th grade Common Core Standards; with commonalities that work across grade 2-8 curriculum.

*Presenters: Christina Betz-Cahill, Kristi Isaacson, School District 45*

**International Trends in Math Education for Gifted Students** **Room 136** **Middle/High School**

Report on lessons learned at the International Congress of Math Education (2016), condensed into three or four in-depth teaching scenarios addressing research and best practices for both gifted and math education, including student perspectives where possible.

*Presenter: Craig Russell, University of Illinois Laboratory High School*

**Creating a Sustainable K-16 Partnership** **Room 200** **General**

Collaborating across grade-levels (K-12) and institutions--public schools-universities--with a sustainable program that facilitates deeper science investigations and learning.

*Presenters: Shalonda Carr, David Bergandine, Dr. Christian Ray, Martin Luther King, Jr. Elementary School*

**Teaching Scientific Controversies Using Letters to the Editor** **Room 201** **General**

Critical science argumentation and literacy skills can be strengthened and assessed using letters to the editor by all types of educators. Attendees can expect to practice assessing sample letters and begin developing ideas for a letter of their own.

*Presenter:* ***Alex Dzurick, University of Illinois***

**Authentic Application in a 21st Century Classroom** **Room 203** **General**

As technologies continue to evolve and provide students and teachers new resources and opportunities, such as Virtual Reality, virtual labs, and video-based content delivery, it's important that students have meaningful opportunities to interact with that content, as well as apply concepts authentically through both hands-on activities and student-created media. Join our Discovery Education team to share tools and strategies that you can implement tomorrow, as well as to learn about new resources and emerging technologies in our Science Techbook.

*Presenters:* ***Emily Sigman, Josh Truman, Discovery Education***

**How can "Failing" Students find Success?** **Room 209** **High School**

Imagine you are given a class of 32 kids, all who failed of Algebra 1! Join us to discuss our journey through teaching this course. We will focus on the successes we had, the power of relationship building, and strategies to help our most struggling students.

*Presenters:* ***Maggie Sharp, Julie Block, Mundelein High School***

**Have An Idea You Need Monetary Support?** **Room 210** **General**

Come! Do you have a project or would like to take more math classes to strength your mathematical content, this session is for you! NCTM Mathematics Education Trust grant or scholarship can help!

*Presenter:* ***Fern Tribbey, Retired***

**Literacy in the Science Classroom** **Room 211** **Elementary**

With time disappearing in our schedules, little resources and support, and a demand for elementary teachers to center their attention on reading and math, this session will focus on how to still have fun, meaningful science lessons that targets reading, writing, and vocabulary skills.

*Presenter:* ***Aprilanne Lynch, Prairie Trail School***

**FALs for All!** **Room 212** **Middle/High Sch**

The Mathematics Assessment Resource Service has over 100 formative assessment lessons. This session will walk teachers through the Representing Quadratics Functions Graphically lesson from two perspectives (senior and 8th grade) and explore ways to adapt the lesson to fit the needs of students.

*Presenters:* ***Marianna Jennings, Daniel Kang, Chicago Public Schools***

**Extensions, Elaborations and Synthesis: Novel Science as Inquiry** **Room 213** **General**

Participants will identify important ideas from a content unit and shape them into a novel science project with the help of professional science partners. Workshop participants will be added to a social network group and the proposed experiment completed together in the 2 months that follow the ILSTA meeting.

*Presenters:* ***Dr. Karim Mustafa, Mayo Clinic,*** *Madeleine Hammerlund****, Driskill Foundation***

**Thin Films: Prisms and Nanotechnology in Geometry** **Room 218** **High School**

An overview of a module on nanotechnology. Using prisms to approximate thicknesses of thin films created by spinning paint onto a substrate. Based on research done during nano@illinois RET.

*Presenters:* ***Steven Pavlakis, Kevin Kennedy, Urbana High School***

**Reading to Make Science Real** **Room 220** **General/Bio**

Teaching students to read about science gives them skills they will need for the future. I will be sharing reading techniques (aligned with NGSS and CCSS) for the biology classroom to give students a better understanding of how science happens in real life.

*Presenter:* ***Aubrey Mikos, Serena High School***

**Teaching Black Students Mathematics Using Black Culture** **Room 222** **General**

Black students are victims to curricula that do not engage them or the issues they confront in their lives or communities. We must teach Black students how to examine their world critically using mathematics.

*Presenter:* ***Evan Taylor, Roosevelt Elementary***

**Understanding Place Value from Whole Numbers to Decimals** **Room 404** **Elementary**

Research-based tasks will be presented that allow K-5 students to be successful with understanding place value as outlined in Common Core State Standards. Attendees will write problems appropriate for their teaching.
Handouts will be provided.

*Presenter:* ***Cheryl Ann Lubinski, Illinois State University***

**Getting at Napolean's Triangles through Transformational Geometry** **Room 405** **High School**

The study of Napolean's Triangles is often ignored in typical high school geometry courses due to difficulties with the construction of the figures involved. But, by USING Transformational Geometry and CABRI on the TI-Nspire calculator, this difficulty is minimized. Come see the amazing results.

*Presenter:* ***Ray Klein, T3--Teachers Teaching with Technology***

# 11:30 a.m.—12:50 p.m. Workshops

**Developing Fraction Skills Using Models and Manipulatives** **Room 401** **Elementary/Middle**

This presentation will review the progression of fraction skills in grades 3-5. Attendees will participate in specific examples to see how different models and manipulatives support conceptual understanding of fractions as well as how they support the C-R-A sequence of math instruction.

*Presenter:* ***Sarah Wargaski, Woodstock CUSD200***

**Desmos Activity Builder: Best thing since Sliced Bread?** **Room 402** **Middle/High School**

Activity Builder is a free DIY tool used to create Desmos-based activities for classroom use. Learn how to access and use a growing library of engaging lessons shared by Desmos and other teachers. Better yet, learn how to create your own! Please bring a laptop or tablet to this session if you can.

*Presenter:* ***Adam Poetzel, University of Illinois***

**What's Change Got to Do with it?** **Room 403** **Supervisors/Administrators**

The instructional shifts of the New ILS in both mathematics & science requires teachers and students to take on different roles then in the past. Understanding change theory, planning for change, & supporting colleagues in the change process is necessary in order for change to actually take place.

*Presenters:* ***Leslie Knicl, Polly Hill, Champaign Unit 4 Schools***

# 12:00 p.m.—12:50 p.m. Concurrent Sessions

**Exploring Mathematics and Science With an Angry Bird** **Room 134** **Middle/High School**

With a flight from the game "Angry Birds" as context, discussion will include graphs, parametric relations, statistical regression, trigonometry and realistic modeling for position, angle, initial velocity, length, height, gravitational force, and time. Mathematics and Science teachers are welcome!

*Presenter:* ***John Diehl, Ismael Zamora, Lyons Township HS***

**Modeling Activities for Middle School through Algebra 2** **Room 135** **Middle/High School**

This session will emphasize modeling activities that can be used to engage middle school through Algebra 2 students. Come ready to do hands-on activities that use graphing technology to get students to understand linear and quadratic relationships.

*Presenter:* ***Denise Young, Blue Valley West High School***

**Comparing the NGSS and CCSS-Math Practice Standards** **Room 200** **General**

While CCSS-Math and NGSS standards are subject specific, the practices for the disciplines have significant overlap. This session will help math and science teachers to identify similarities in the practices for each discipline and look to determine ways to inform and enhance student outcomes.

*Presenters:* ***Greta Mitchell Williams, Rebecca Resnick,***
***Proviso Mathematics and Science Academy***

**From Memorization to Modeling: Reconceptualizing Teaching About Cellular Division** **Room 201** **General/Biology**

Experience activities that use modeling to teach about cellular division, and leave with ideas for modifying curriculum materials to better meet the NGSS. Curriculum materials that use the phenomenon of planarian regeneration will be made freely available, and we will specifically discuss unit storylines, assessment boundaries, and evidence statements.

*Presenters: Robert C. Wallon, Barbara Hug, University of Illinois at Urbana-Champaign*

**Addressing Misconceptions in Intermolecular Interactions** **Room 202** **General/Chemistry**

A previous evaluation of student responses to a discrepant event regarding intermolecular interactions lay the foundation for addressing student misconceptions of ions, polar and non-polar compounds. After receiving new learning materials, students respond to the same discrepant event and their responses are analyzed.

*Presenter: Kathryn Rowberg, Purdue University Calumet*

**Curriculum Design, RTI, and Skills...Oh My!** **Room 203** **High School**

Develop a skills based curriculum that provides opportunity for formative assessment and timely Response to Intervention. Use NGSS and Common Core to ensure that your students can master literacy, numeracy, and science skills!

*Presenters: Adam Roubitchek, Kimi Johnson, Maine West High School*

**Let's Talk! Effective Student Discourse** **Room 209** **Middle/High School**

How do we get students to engage in mathematical conversations? Come hear about strategies that will help establish this collaborative learning environment. And please bring any strategies that you would like to share!

*Presenter: Jennifer Dao Nichols, Middle School*

**Learning the Language of Math** **Room 210** **Middle School**

The workshop will focus on the process of developing math concepts by building on students' experiences before the math terminology is introduced. Topics will include patterns, ordinal numbers, addition and subtraction, and area and perimeter.

*Presenter: Marie Kielty, Marie Kielty Consulting*

**Preparing for Units in a Three Dimensional Model** **Room 211** **General**

NGSS has presented a three dimensional learning model that helps support student success. Whether you are a teacher or administrator come and learn how to prepare future units. We will use video, practice, and planning in order to become masters of all three NGSS strands.

*Presenter: Ana Appel, Ascend Charter Schools*

**Engineer the Tools for Inquiry of Candy Food Dyes** **Room 212** **General**

What's in your candy? Extract the colorful food dyes from candy and separate them on a do-it-yourself agarose electrophoresis box to identify what dyes were used to make them so appealing. This budget-friendly inquiry based activity makes for a great skills lab by teaching pipetting, gel electrophoresis and making solutions with stunning results. Turn this into a complete STEM and NGSS-aligned activity by building your very own horizontal electrophoresis box, allowing your students to investigate the science and engineering behind a workhorse in the biotech lab.

*Presenter: Mary Clark, Vernon Hills High School*

**Intervening for Students Who Consistently Struggle in Math** **Room 218** **Elementary/Middle**

In this session, we will briefly discuss some of the research behind academic persistence and productive struggle. The bulk of this session will be introducing self-regulated strategies as alternative approaches to support these struggling learners to get the most out of your math instruction.

*Presenters: Quentin M. Wherfel, Maya Israel, George Reese, University of Illinois Urbana*

**Increase Student Motivation by Gamifying Your Classroom** **Room 221** **Middle/High Sch**

In this session, you will learn how to integrate a leaderboard in your classroom. You do not need a lot of tech in your classroom for this to work (1:1 or no tech, Gamifying does not discriminate!). This is a low cost way (free if you want) to motivate students who are not intrinsically motivated!

*Presenter: Matthew Miller, George Washington High School*

**Math Talks in the High School Classroom** **Room 222** **High School**

Math talks build conceptual understanding, fluency, efficiency with numbers/ operations, and positive discourse. Math talks were implemented daily in a 10th grade classroom to establish classroom norms and develop CCSS Math Practices. Observations, challenges, and resources will be shared!

*Presenter:* *Miriam Schmid, Gwendolyn Brooks College Prep*

**Engaging Students with Math Practices For Every Curriculum** **Room 404** **General**

There is a huge buzz about selecting the appropriate curriculum for implementing standards aligned instruction. Here, explore engaging strategies that highlight the math practices to obtain and hold students' interest and make deeper and longer lasting connections while improving achievement.

*Presenter:* *Anita Reid, Lewistown High School*

**Translating Research to the Classroom** **Room 405** **High School**

How a summer spent researching several topics in discrete mathematics has transformed a classroom perspective and approach. Participants will take away several specific examples of activities, and will take away a broader explanation on how to apply these techniques to any course/classroom.

*Presenter:* *Alexander Fischer, H. D. Jacobs High School*

# 1:00 p.m.—1:50 p.m. Concurrent Sessions

**Creating an Atmosphere of Success with Engaging Activities** **Room 134** **Middle/High School**

Help your students reach deeper levels of understanding through activities that promote problem solving, team work, and critical thinking. This session will also include strategies to check for understanding.

*Presenters:* *James Dobrzanski, Mary Pat Anderson, Rose Cicero, Morton East High School*

**Top 10 Easy Access Ways to Grow as a Math Teacher** **Room 135** **General**

Is your traditional professional development impacting math instruction and student outcomes? Research says it probably is not. Learn some tried and true PD methods and think outside of the box options to deliver PD and take control of your own professional growth.

*Presenters:* *Danielle Lee, Amber Denbo, CUSD 308*

**Illinois Oil Production Profit** **Room 136** **Middle/High School**

Algebraic exploration of the costs and revenue associated with drilling for oil in Illinois. Students determine oil well viability and better understand variables and vocabulary related to oil exploration and production. We will also discuss the free annual summer conference.

*Presenter:* *Bryan Hartman, Monticello Middle School*

**STEM WOW** **Room 200** **High School**

Lemont High School has developed and fostered a summer program of inclusion for both individuals with disabilities and general education students. Students collaborate on STEM activities and develop STEM skills. Students have the opportunity to incorporate skills in the area of social communication and develop positive relationships.

*Presenters:* *Tim Leffler, Mike Beranek, Scott Collins, Lemont High School*

**Empowering and Mentoring Students in Scientific Reading, Writing, Listening, Speaking, and Thinking Skills** **Room 201** **General**

Transform student learning by fostering scientific habits of mind! Drawing from research on disciplinary literacy, we offer a practical approach to develop the higher-order thinking and reasoning skills required by the NGSS and CCSS. Participants will learn discipline-specific strategies designed to increase student ownership of the learning process.

*Presenters:* *Colleen Melie, Lisa Harrington, Consortium for Educational Change*

**Support for Modeling in Mathematics using Science** **Room 202** **General**

The Common Core Mathematical Practices of Modeling (MP4) and Using Appropriate Tools (MP5) provide opportunities for students to apply their mathematical skills to science problems. This session focuses on resources teachers can use to find or create data for use as models in the mathematics classroom.

*Presenters:* *Rebecca Resnick, Greta Mitchell Williams, Proviso Mathematics and Science Academy*

**Day 1: Uniting Geometrical Constructions and Proofs** **Room 210** **Middle/High School**

As an architect, it gives me goose bumps to see geometric constructions that are so darned elegant. As a math teacher, I get them when students develop elegant proofs. Geeky, right? Can my 2 loves be combined from Day 1? Yes! Bring a compass (or use mine) & straightedge and let's make connections!

*Presenter:* *Matthew Foster, Waukegan High School*

**WOW! Student by Student- Personalize your Mathematics Classroom** **Room 212** **Elementary/Middle**

Do you have students of varying abilities in your mathematics classroom? Learn how you can individualize and create meaningful learning paths for your students using existing programs, technology, and hardware.

*Presenter:* *Kara Granger, K-8 Virtual School*

**Developing Number Sense in the Middle Grades** **Room 218** **Elementary/Middle**

Do you struggle finding age-appropriate activities and lessons to teach number sense and the concepts of place value to your middle-level students? This session will discuss a number of warm-ups, investigations, and center activities for students to develop these concepts in middle-level students.

*Presenter:* *Nicolette Staley, Taft Elementary*

**Math - Right From the start in Preschool** **Room 221** **Early Elementary**

Learn how MATH: RIGHT FROM THE START training, materials and coaching led to the implementation of math strategies that helped preschool children increase skills, teachers gain confidence teaching math, and involved families, all through PLAY! Activity handouts and Research data provided.

*Presenters:* *Angela Giglio Andrews, Tina Johnson, Nancy Hinnen and Pekin YWCA Preschool Staff, National Louis University (retired)*

**Using Statistics to Explore Issues of Equity and Privilege** **Room 222** **High School**

Using statistics in an Algebra 1 class to explore issues of equity and privilege in society. We will share a unit covering basic Common Core statistic ideas, as well as current research on teaching with equity in mind.

*Presenters:* *Christine Rinkenberger, Kevin Kennedy, Urbana High School*

**Using Social Media in the Math Classroom** **Room 404** **General**

Discover ways to incorporate tech in math class and redefine what students can produce to demonstrate knowledge. Learn strategies for students using social media such as blogs and Twitter. Finally, learn about resources math teachers are creating that you can use right away in your own classroom.

*Presenter:* *Annie Forest, Berwyn South, District 100*

**Selecting Tasks as Described in Principles Into Actions** **Room 405** **Middle School**

Tasks can be selected to promote reasoning and problem solving. Using NCTM's books on essential understanding and practice (NCTM, 2010, 2015), I will provide examples of how to develop conceptual understanding and procedural fluency involving topics from middle school. Handouts provided.

*Presenter:* *Albert D. Otto, Illinois State University*

## 1:00 p.m.—2:00 p.m. Poster Session Conference Center Lobby

**Modeling Multiplication with Rectangular Arrays – Do Kids Understand the Diagram?**

Multiplication instruction is often presented using the rectangular array model, but to what extent do students actually see the side lengths as factors and the number of squares in the array as the product? Eighty 4th grade students from four classrooms who had received multiplication instruction prior to the interview were asked to write equations to match arrays, and vice versa, with surprising results. Come to share in the analysis discussion.

*Presenter:* *Catherine Kaduk, University of Illinois at Chicago*

**Characteristics of Good Problems at Elementary/Middle School Levels**

A description of the four characteristics a good problem at the elementary/middle school level will be given, and discussed. Examples of these problems will be presented at the poster, and also on a useful handout.

*Presenter:* *Jerry Becker, Southern Illinois University Carbondale*

**Computer Science and Common Core Math k-5**

There is a natural intersection between computer science and mathematics. Can the two be meaningfully integrated in a k-5 curriculum? This poster will describe what we have learned as we develop curriculum that weaves rich computer science learning experiences into a Common Core based math curriculum.

*Presenters: Todd Lash, Minsoo Park, University of Illinois at Urbana-Champaign*

**Using Motion Detectors in the Middle Grades to Build Graph Literacy**

Working in groups, middle grade students completed a series of "missions" using a TI-Graphing Calculator and a handheld motion detector. The theme of piloting a helicopter was used to give context to reading and creating a variety of graphs. Pre and post assessments were given to both a 5th grade class and 8th grade class and were analyzed for impact of students' graph literacy. Activity files, calculator directions, and teacher notes will all be made available to interested educators.

*Presenters: Adam Poetzel, Karen Meyer, University of Illinois at Urbana-Champaign*

**Delivery of Math Instruction**

The poster will describe three ways to structure a middle school math class to deliver math instruction. As middle school math teachers we are constantly being asked to do a lot in our classrooms. Differentiation, exploration, small class instruction, gradual release of instruction, common core math practices, math discussions, effective co-teaching, and formative assessments are extremely overwhelming especially in less than 50 minutes each day. The current practice of grading homework, taking notes, practicing problems, and starting homework can be replaced with mini lessons, activity based lessons, and release of instruction lessons.

*Presenter: Jillian Mackey, Clarendon Hills Middle School*

**Making It All Work in a One-to-One Elementary Math Environment**

Woodstock CUSD 200 has recently made the move to a one-to-one teaching environment with Chromebooks as well as adopting new math materials. See how we use the technology to transform teaching without leaving behind the best practices from the field of mathematics.

*Presenters: Sarah Wargaski, Linda Gabrielson, Woodstock CUSD 200*

**FUNctions with Desmos**

Desmos is an interactive online graphing calculator that engages K-12 students with investigating mathematical relationships. Our poster will highlight activities that use functions to mathematically model different situations. Desmos has interactive games and activities such as Cannon Guy, Central Park, and Marble Runs. These activities allow students to develop a deep understanding of function families, transformations, rate of change, and algebraic expressions. The function project allows students to take their new function knowledge and create a piece of art using restricted domains and animations!

*Presenters: Sahar Barakat, Hailey Bramwell, Saint Xavier University*

**Morning Work Number of the Day**

Number of the Day strategy is used for reviewing key concepts and we are studying whether the size of the number selected impacts student success on the task. In the strategy, a selected number is manipulated, i.e. make equations with it or use it to show place value, addition, subtraction, multiplication or fractions. The activity supports consistent practice and self-assessment opportunities. It provides valuable information on what students know about previously studied topics and identifies students who have retained skills. From this data students are placed in small groups to go over concepts as needed.

*Presenter: Vicki Ranallo*

**Multicultural Mathematics**

The focus of our presentation is to discuss the experiences we had while we participated in a week long journey of teaching and learning while working with partner teachers in a Guatemalan school. Our reflections will give our audience a glimpse into the opportunities we shared in observing, creating, and co-teaching lessons to Spanish-speaking children. Our conversation during this session will also include our after school professional development sessions with the Guatemalan teachers as together we discussed improvements in mathematical knowledge for teaching both in subject matter knowledge and pedagogical content knowledge while embracing this rich, cultural experience.

*Presenters: Pamela Faber, Aurora University, Patricia Nugent, Bradley University*

**Social and Emotional Learning in Elementary Mathematics and Science Classrooms**

Addressing the social and emotional learning standards is paramount to creating and maintaining a safe and effective learning environment in today's diverse elementary-level classrooms. Opportunities for social and emotional learning present themselves regularly during mathematics and science investigations as well as during the sharing of findings. Pre-service teachers in elementary mathematics and science methods courses at the University of Illinois at Springfield utilize written small-group activity reports to assist them in recognizing how their future students can develop and use social and emotional learning skills while exploring mathematics and science concepts.

*Presenter:* *Victoria Childs, University of Illinois at Springfield*

**Teaching Zero Across Different Cultures: A lot of talk about nothing**

This session will present the Babylonian, Indian, Mayan and Arabic use of zero. In addition, this presentation will discuss the identity property of addition, multiplication property of zero, division zero, and zero as an exponent.

*Presenter:* *Cheng-Yao Lin, Southern Illinois University Carbondale*

**Effects of Parents Involvement on Mathematics Performance: A Cross-national Study**

The poster will compare the various aspects of parental influence in terms of homework involvement, encouragement and expectations, and self-efficacy in mathematics education among different cultural groups. In addition, it will show how differently roles of parents play and how parents among different cultural groups interact with their children to enhance their children's mathematics learning.

*Presenter:* *Eunmi Joung, Southern Illinois University Carbondale*

**A Numbers Game**

This poster is centered around the idea that playing family games fosters mathematical understanding in kids beginning at a very young age. This exhibit is also meant to invite teachers and other professionals to offer and share suggestions for how specific games can be used in the classroom or at home to help children develop number sense and problem solving skills. The ultimate goal is to provide an avenue for thinking about and collaboration around tried and true board/card games to further mathematical achievement and knowledge in elementary school kids.

*Presenter:* *Sarah Henderson-Washington, Illinois Institute of Technology*

# 1:00 p.m.—2:20 p.m. Workshops

**Using Bar Models to Teach Word Problem Solving at the Elementary School Level** **Room 401** **Elementary/Middle**

Solving complicated word problems has been deemed as a challenge for many elementary school students. The introduction of bar models could help students easily identify the numeral relationships in word problems and therefore select appropriate algorithms with a clear understanding of the problems.

*Presenter:* *Xiaobo She, Governors State University*

**IMTE Annual Business Meeting** **Room 402** **Teacher Preparation**

All interested in teacher education in IL are welcome to attend the annual business meeting of the IL Mathematics Teacher Educators (IMTE) Association. This meeting will include reports from board members and election of officers. News from ISBE in regards to teacher education will be shared.

*Presenter:* *Todd D. Oberg, Illinois College*

**Engineering for Youth** **Room 403** **Elementary/Middle**

How do I do Stem or engineering with no money for supplies? Where do I even begin? In this hands-on workshop you will participate in using ordinary, everyday supplies to explore concepts of engineering. Come and experience Stem/engineering first hand.

*Presenters:* *Patti Davis, Kristin Flanagan, Richland County Middle School*

# 2:00 p.m.—2:50 p.m. Concurrent Sessions

**Pedagogy in the Teaching of Statistics in Middle School** **Room 134** **Middle School**

Computer animated videos will be used to start a discussion on Pedagogical Content Knowledge that teachers use while teaching statistics in the middle school. Videos will concentrate on highlighting misconceptions and strategies used when introducing measures of center to sixth grade students.

*Presenter:* ***Dhimitraq Duni, Illinois State University***

**The Redesigned SAT: What Every Math Teacher Needs To Know** **Room 135** **Middle/High School**

The redesigned math SAT will become common across Illinois this spring. Do you know about its major changes? Build your understanding of its content foci, problem-solving, item types, and more. We'll also consider implications for instruction across middle and high school contexts.

*Presenter:* ***Sendhil Revuluri***

**Live + Laugh + Love = Learn** **Room 136** **Middle School**

Put a positive parabola on each of your students' faces while keeping them engaged!! Let your passion for math, aka best subject ever, shine while having fun implementing mathlicious projects and activities!

*Presenter:* ***Kim Thomas, 2016 Illinois State Teacher of the Year, Peoria Public Schools***

**Team Math Trivia!** **Room 201** **General**

Tired of having other subjects dominate the trivia scene? Want to show off your math prowess? Come on out to Team Math Trivia! Teams of 3 to 6 will compete in 4 rounds of pub-style trivia, where all questions and tunes are math-related! Prizes will be awarded, individuals and teams are welcome.

*Presenters:* ***John Riddle, Patrick Fox, Kelsey Gacek, Metea Valley High School***

**Using YouTube to Flip Your Classroom** **Room 202** **Middle/High School**

The flipped classroom is the integration of videos watched at home to enrich higher performing applications/experiments in class. STEM initiatives, differentiation and RtI is also explored utilizing this method. We will experiment specifically how to implement as we investigate various technologies.

*Presenter:* ***Dustin Berthold, North Boone High School***

**Spend, Save and Share** **Room 203** **Elementary/Middle**

This presentation will focus on ways students can take care of their financial futures by saving, sharing and spending. The participants will learn how to assist our students in determining the three S's. We will investigate mortgages, interest rates, deposits and withdrawals.

*Presenter:* ***Eileen Quinn Knight, Ph.D., St. Xavier University***

**Interactions with Fractions** **Room 209** **Elementary**

Join us in a discussion about the struggles that students have when adding and subtracting fractions. Problems will be introduced that bring up the major mistakes, misconceptions and strategies students use. You will leave with several activities to use in your classroom.

*Presenter:* ***Lawrence Ssebaggala, Illinois State University***

**Enrichment Activities in Geometry** **Room 210** **High School**

Building Platonic/Archmedian solids, tie Fibonacci sequence to Golden Rectangles and other activities.

*Presenter:* ***Fred Flener, Retired***

**How to Integrate Games Into Math** **Room 212** **Elementary**

Games are a fun and effective way to help students learn math. Get some practical tips on how to integrate games into your math classes and look at how to maximize the opportunities for encouraging students to construct viable arguments and critique the reasoning of others. (SMP3)

*Presenter:* ***Jean Capper, University of Chicago-CEMSE***

**Complex Instruction Consortium: Innovation in Teacher Professional Development** **Room 218** **Middle/High School**

The Complex Instruction Consortium was established in 2009 and has hosted over a dozen free workshops since. Hundreds of teachers have joined the network, ultimately impacting thousands of students. Come learn how the CIC can make a difference for your teaching and your school!

*Presenter:* ***Zachary Herrmann, Harvard Graduate School of Education***

**Student Collaboration With Computer Programming and Elementary Math** **Room 221** **Elementary**

We are a team of researchers and teachers working with K-5 students to understand how to integrate mathematics instruction with computing. We will share some of the math/CS lessons we developed and the research questions and tools we are exploring. Our special focus is on student collaboration.

*Presenters:* ***Maya Israel, Quentin M. Wherfel, Saad Shehab, University of Illinois***

**Using Virtual Manipulatives to Improve Student Achievement** **Room 222** **General**

The purpose of this action research was to investigate the effect of virtual manipulatives on the assimilation, comprehension, and retention of fractional, decimal, and percentage mathematics of middle school students.

*Presenters:* ***Dr. Nikki Boyd Rana, Iman Academy***
***Reema Alnizami, North Carolina State University***

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| 40 | Activate Learning | activatelearning.com 708-205-5691 | |
| 41 | Battle Creek Area Math & Science Center | bcamsc.org 269-213-3904 | |
| **91 & 92** | **BIOZONE International** | thebiozone.com **855-246-4555** | ***FRIEND OF SCIENCE ED*** |
| 45 & 46 | Bosch Tool Corporation | us.bosch.com 224-232-4717 | |
| 80 | Camp Invention | campinvention@att.net 800-968-4332 | |
| 9 | Carnegie Learning Center | carnegielearning.com773-726-3604 | |
| 84 | Carolina Biological Supply | carolina.com 800-334-5551 | |
| 94 | Chicago Zoological Society | czs.org 708-688-8233 | |
| 19 & 20 | CPM Education | www.cpm.org 916-638-1145 | |
| 65 | Delta Education/FOSS | delta-edu.com 800-258-1302 | Test drive kit |
| 2 | DINAH.com | dinah.com 800-993-4624 | |
| 28 | Dream Box Learning | dreambox.com 877-451-7845 | |
| **63 & 64** | **ETAhand2mind** | **hand2mind.com 847-968-5204** | ***SPONSOR OF SCIENCE ED *** |
| 8 | Explore Learning | explorelearning.com 866-882-4141 | |
| 47 | Fisher Science Education | fishersci.com 800-955-1177 | |
| 25 | FLINN SCIENTIFIC, INC | flinnsci.com 800-452-1261 | |
| 66 & 67 | Frey Scientific/CPO Science | schoolspecialty.com 630-842-4148 | |
| 13-15 | Houghton Mifflin Harcourt | hmhco.com 617-351-5000 | |
| 90 | House In The Wood | houseinthewood.org 262-728-2752 | Classroom pack |
| 83 | IL Assoc. of Aggregate Prod. | iaap-aggregates.org 217-241-1639 | $60 tchr. Regist@ IAAP 7/17 Galena workshop |
| 93 | IL Assoc. of Bio. Teachers | iabt.org | |
| 6 | IL Council of Tchers of Math | Ictm.org | |
| 76 & 77 | IL Dept. Nat. Resources—Ed. | dnr.illinois.gov 217-524-4126 | Hornets' nest |
| 61 | IL Environ. Prot. Agency | epa.illlinois.gov | |
| 100-101 | IL Petroleum Resources Brd. | iprb.org 618-242-2861 | 2 $100 gift cards |
| 39 | Illinois Science Olympiad | Illlinoisolympiad.org 630-386-3149 | |
| 95 & 96 | IL Science Teachers Assoc. | ilscience.org | |
| 5 | IL State Univ—Math Dept. | ilstu.edu 309-438-8510 | |
| 58 | IL Water Environment Assoc. | iweasite.org | |
| 59 | It's About Time | iat.com 914-273-2233 | |

# Exhibitors Continued

| Booth | Name | Contacts www & phone | Raffle Prizes |
|---|---|---|---|
| 22 & 23 | Kendall/Hunt Publishing | kendallhunt.com 563-589-1075 | |
| 79 | The Markerboard People | dryerase.com 800-379-3727 | |
| 11 & 12 | The Math Learning Center | mathlearningcenter.org 800-575-8130 | |
| 10 | Math Rack | mathrack.com 630-803-2746 | |
| 26 | MEEMIC | meemic.com 248-373-5700 | |
| 54 | Methodist College | methodistCOL.edu 309-671-5143 | |
| 62 | MicroTech Microscope S & S | scopeman.com 800-370-9074 | |
| 7 | Millikin University | milliken.edu 217-362-6215 | |
| 27 | NASCO | enasco.com 800-558-9595 | |
| 60 | Natl. Geog. Soc.--CENGAGE | cengage.com 513-535-2667 | |
| 97 & 98 | NSTA Press | nsta.org 773-442- 4418 | |
| 89 | Nutrients For Life | nutrientsforlife.org 202-384-6236 | All free materials |
| 18 | Origo Education | origomath.com 314- 475-3061 | |
| 36 | PASCO Scientific | pasco.com 916-462-8208 | |
| 50-52 | Pearson Education | pearson.com 847-376-9214 | |
| 3 | Perennial Math | perennialmath.com 256-797-7063 | |
| 99 | Pres. Awards for Excellence in Math & Sci Tchng | paemst.org | |
| 24 | The Scope Shoppe, Inc. | scopeshoppe.com 630-842-3094 | advanced student micro-scope @$600 |
| 48 | Squishy Circuits | squishycircuits.com 763-486-5832 | |
| 35 | Student Energy Ed. Program | clearesult.com 855-678-3775 | |
| 71 | Studies Weekly | studiesweekly.com 866-311-8734 | |
| 1 | Texas Instruments | ti.com 800-842-2737 | |
| 4 | Think Through Math | thinkthroughmath.com 847-732-5005 | |
| 72 | UIUC- College of ACES | illinois.edu 217-333-9729 | |
| 44 & 57 | Van Andel Ed. Institute | vai.org 616-234-5528 | One CHROMEBOOK |
| 49 | Vernier Software & Tech. | vernier.com 888-837-6437 | $100 Vernier gift certificate |
| 37 & 38 | Wards Science | vwr.com 630-386-3149 | $200-250 TBD |
| 78 | Western Governor's Univ. | wgu.edu 385-428-1000 | |
| 21 | Wowzers | www.wowzers.com 872-588-6850 | |
| 53 | zSPACE | zspace.com 408-498-4050 | |