

2017

Elements of
STEM
Conference


presented by
the Iowa Science Teaching Section of the Iowa Academy of Science

October 8-9, 2017

Des Moines Area Community College
Ankeny Campus FFA Enrichment Center

1055 SW Prairie Trail Parkway

2017 ISTS Elements of STEM Conference Schedule

Time/ Session	Conference A (106)	Conference B (107)	Conference C (108)	Conference D (109)	Conference E (112)	Conference F (113)
Opening Session (8:00 – 8:30)	Opening Session with Welcome Message by DMACC President Rob Denson					
	AM Exhibitor Time		AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time
Breakout #1 (9:00 – 9:45)	 See pages 12-13	Janis Hall & Randy Olson Earth Science Standards & You (E/MS/HS – St)	Mary Trent STEM Resources – Online & Regional (E/MS/HS – RI, DE)	Peggy Christensen & Kay Neumann Help Your Students SOAR with Real Iowa Data (MS/HS – St, RI, Ar)	Cindy Hall & Will Fett Plant Phenomena (E/MS/HS – St, CI, CC, RI, 3D)	Maureen Griffin Whole Class Inquiry: Creating Student-centered Classroom Communities (MS/HS – As, CC, RI, EI)
Breakout #2 (10:00 – 10:45)			Jeff Weld In Iowa, STEM Starts with Science Teachers: Opportunities to Engage (E/MS/HS – CC, RI, Pa)	Marcy Seavey Exploring Authentic 3D Printing Classroom Ideas (MS/HS – As, RI, DE)	Nadine Weirather Using Research Projects to Meet the Iowa Core Science Standards (NGSS) (MS/HS – St, CI, RI, Ar)	
	AM Exhibitor Time		AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time
Breakout #3 (11:15 – 11:45)		Kristin Rademaker Introduction to Productive Talk (E/MS/HS – St, CC, Ar)	Matthew Hannes & Walker Adams Get Organized: Using Atom Models to Assess Understanding of the Periodic Table (HS – M, St, As)	Bennett Brown & Maurine Neiman Computer Science in Middle School Science (MS – M, Ld)	Jordan Menning How to Integrate Real-world Connections for Student Learning (E/MS/HS – RI, Pa)	Michael Clough Connecting Science and Engineering Practices: A Cautionary Perspective (E/MS/HS – St, DE)
Lunch (11:45 – 12:30)	Lunch					
Keynote (12:30 – 1:30)	Keynote – Chad Dorsey “Unlocking the Elements of STEM with Technology”					
	PM Exhibitor Time		PM Exhibitor Time	PM Exhibitor Time	PM Exhibitor Time	PM Exhibitor Time
Breakout #4 (2:00 – 2:45)	Jacob Pleasants Productive Missteps During Inquiry Science (MS/HS – St, CI, Ar)	Darin Christenson Lab-Aids/SEPUP Reproduction - Breeding Critters - More Traits (MS—M, St, As, CI, CC, RI, 3D)	Erin Hollister & Jaclyn Easter Where Have the Birds Gone? Engineering Solutions to Authentic Problems in Elementary Science Classrooms (E – RI, DE, 3D)	Will Fett & Cindy Hall What’s the Big Deal? Nitrates and Water Quality (MS/HS – St, RI, Ar, 3D)	Yen Verhoeven & Sarah Bappe Puzzling Out the Nature of Science from K-12 (E/MS/HS – St, CI, CC)	Melinda Higgins An Innovative Approach to STEM Engagement: Driving Equity in Access for All (E/MS/HS – Ei, CC)
Breakout #5 (3:00 – 3:45)	David Doherty Atomsmith® Classroom Online: Interactive, Dynamic and Physically Accurate Models & Activities with Atoms and Molecules (HS-M, St)	Jolie Pelds Technology Tools Driving Deep Thinking (E/MS – RI, 3D, St)	Jesse Wilcox & Alaina Lake Teaching Nature of Science in Elementary & Middle Grades: Strategies & Resources (E – CI, RI, 3D)	Colin Reichert Promoting Model Based Reasoning in the Physical Sciences (E/MS/HS – M, As, CI, Ar)	Susanna Ziemer & Ted Neal Iowa Students Engaging in Real Science in their Community: Contextualizing Iowa’s Science Standards through Local Inquiry (E/MS/HS – St, RI, Ar, 3D, Pa)	Dawn Posekany & Miranda Kral Connecting Students with the Community through the Literature of Science (HS – Pa)

2017 ISTS Elements of STEM Conference Schedule

Time/ Session	Conference G (114)	Conference H (115)	Classroom 208	Classroom 209	Classroom 214	Classroom 215
Opening Session (8:00 – 8:30)						
	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time
Breakout #1 (9:00 – 9:45)	Kris Kilibarda “Phenomenal” Teaching & Learning with Iowa’s New Science Standards (E/MS/HS – St, 3D)	Ernie Schiller Rebuild Nepal Education (E/MS/HS – CI, CC, RI, Pa)	Hannah Haahrues -Casey & Kelly Carr Notebooking in the Science Classroom (E/MS – CI, CC, DE, Ar)	Denise Krefting & Deborah Cleveland Supporting STEM Students with Personalized Learning (MS/HS – St, CI, RI, EI)	Reagan Boeset & Chelsea Slaba Best Practices in STEM Education: Learn from 2015-17 I.O.W.A. STEM Teacher Recipients (E/MS/HS – Id, CC, Pa, 3D)	Jesse Wilcox & Dan Chibnall Astronomy that Makes Sense: Helping Students Hear and Feel the Outcomes (E/MS/HS – M, St, CI)
Breakout #2 (10:00 – 10:45)	Gayle Ramaeker & Liz Carpenter Penguins in 3D (E – M, CI, RI, 3D)	Jenny Boldt & Dawn Posekany Exposing Students to Real World Issues through Literacy (HS – St, RI)	Sara Nelson & Nicole Hanson Supporting Student Investigations through Integrated STEM and Literacy Events (E – CI)		Alicia Schiller-Haynes & JameySue Smith Incorporating NASA Resources into the STEM Classroom (E/MS/HS – Pa)	Rebekah Domayer & Erna Mahmutovic Field of Streams: A Day in the Life of a SHL Limnologist (MS – CC, RI, Ar)
	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time	AM Exhibitor Time
Breakout #3 (11:15 – 11:45)	Beth Hochstedler, Erica Larson & Rick Bonar State Hygienic Lab Student Mentorship Program (MS/HS – CI, RI, Pa)	Nanette Fladung Bullet Journals for Teachers (E/MS/HS – As, Id, Ei)	Hallie Edgerly, Jaclyn Easter, Sarah Hunt & Rylee Smith Boat Races: Motion, Forces & Engineering Design (MS – St, CC, DE)	Kristina Tank & Michael Dupont What Makes an Effective Elementary Engineering Design Lesson? (E – DE)	Andrea Malek & Ted Neal Using Iowa Data to Implement Standards: A Flexible Curriculum (MS – St, CI, Ar)	Jason Lang & Meghan Lang Iowa STEM Externships (E/MS/HS – RI, Pa)
Lunch (11:45 – 12:30)						
Keynote (12:30 – 1:30)						
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Breakout #4 (2:00 – 2:45)	Craig Walter & Nick Peters Trouble at Grainly Farms: A 3-dimensional Unit of Instruction (MS/HS – RI, Ar, 3D)	Nicole Vick Next Generation Science Standards: Conceptual Shifts (E/MS/HS – M, St, RI)	Amy Johannsen & Eric Hillman Making Learning 3-dimensional (E/MS/HS – M, CI, 3D)	Dana Atwood-Blaine & Audrey Rule ARIS: Augmented Reality and Interactive Storytelling (MS/HS – As, CI, CC, 3D)	Kara Hageman Put Me in, Coach! (MS/HS – St, As)	Muhammad Spocter & Kacia Cain Neuroanatomy in an Afternoon (HS – RI, DE, 3D, Pa)
Breakout #5 (3:00 – 3:45)	Mark McDermott & Katie Weiss Using the ASSIST Approach to Implement the Iowa Science Standards (E/MS/HS – St, Ar, 3D)	Kristine Bullock & Naomi DeWinter Iowa STEM BEST – A Model to Incorporate Businesses to Meet Elementary NGSS Standards (E/MS/HS – St, RI, Pa)				

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Help promote science research, science education, the public understanding of science, and recognize excellence in these endeavors by becoming a member of the Iowa Academy of Science.

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Conference Sponsors

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Our vision is to unlock the full potential of each learner. Our mission is to accelerate learning through intuitive, engaging, efficient and effective experiences – grounded in research.

We believe that our contribution to unlocking a brighter future lies within the application of our deep understanding of how learning happens and how the mind develops. It exists where the science of learning meets the art of teaching. Why? Because learning changes everything.

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Pre-Conference Events



**SCIENCE
CENTER
OF IOWA**
& BLANK IMAX
DOME THEATER

401 W Martin Luther King Jr. Parkway
Des Moines, Iowa

Sunday, October 8, 2017

6:00 P.M.—9:00 P.M.

Join us for an exciting evening of networking and learning. Attendees will have the opportunity to attend several “mini workshops” led by ESTA and PAEMST award winners and nominees. Workshops will focus on the new standards implementation, pre-service teacher supports, and general STEM “best practices”. Music, food and drinks will be provided with registration.

The Presidential Awards for Excellence in Mathematics and Science Teaching

(PAEMST) are the Nation's highest honors for teachers of mathematics and science. The awards recognize highly qualified K-12 teachers for their contributions in the classroom and to their profession. The core of the award is a \$10,000 National Science Foundation grant to the recipient's school, to be spent at the teacher's discretion.



2017 Iowa Science Finalists



Mike Todd
Ames High School



Mike Wedge
Sibley-Ocheyedan High School

**Times and rooms for individual breakout sessions in this program
are subject to change.**

For a detailed listing of all sessions:

<https://www.scienceiniowa.org/fall-conference-1>

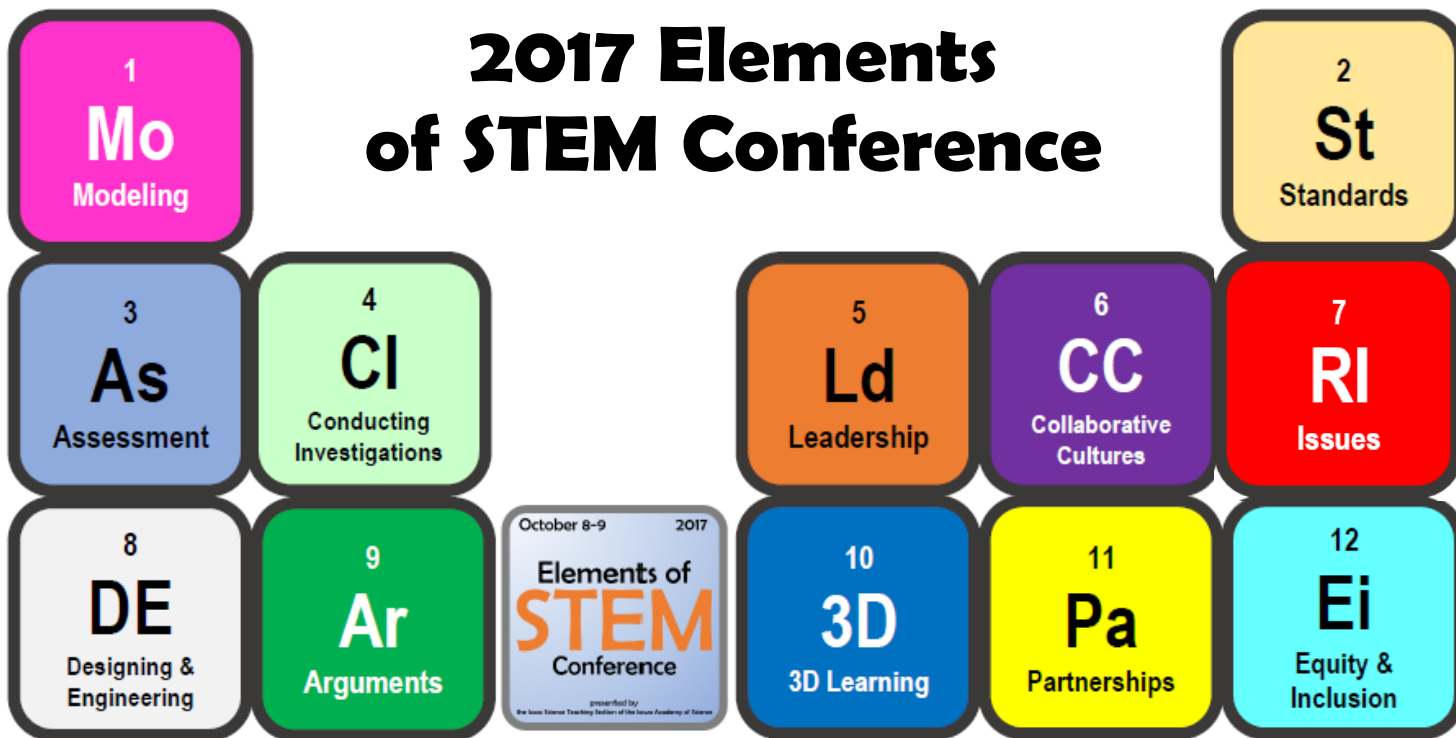
Don't forget to follow ISTS on social media:

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www.scienceiniowa.org

 **#ISTSElements2017**

2017 Elements of STEM Conference



Element #1: Modeling (M)

Models are used to represent a system (or parts of a system) under study, to aid in the development of questions and explanations, to generate data that can be used to make predictions, and to communicate ideas to others (NSTA, 2014). Sessions which address this element will provide educators with authentic ways to incorporate modeling into their instruction.

Element #2: Standards (St)

With the adoption of the new Iowa Science Standards, classroom teachers are being asked to recognize that science is not just a body of knowledge that reflects current understanding of the world; it is also a set of practices used to establish, extend, and refine that knowledge. Join us in these sessions to learn how other classroom teachers and building/district leaders are implementing Iowa's new standards.

Element #3: Assessment in STEM (As)

Wondering what high quality assessment looks like in a STEM classroom? These sessions will help us answer questions like: what are students learning, how are they thinking, and what understandings and skills are they gaining as a result of this STEM lesson?

Element #4: Conducting Investigations (CI)

Ever wonder where in your curriculum you can best support students to devise and investigate their own interests and questions? Attend these sessions to find out how your colleagues are managing this important scientific practice in their classrooms.

Element #5: Leadership in STEM (Ld)

How can teacher leaders, school and district administration and other support staff best help teachers bring STEM to life? Join us in these sessions to learn from other leaders and share your own experiences.

Element #6: Collaborative Cultures (CC)

Researchers have found that in many situations, students demonstrate a higher level of engagement and a deeper understanding and retention of concepts when they participate in collaborative group work. These sessions will help us define what high quality collaboration looks like and how to best cultivate attitudes and habits of mind which support these structures.

Element #7: Real-world Issues (RI)

The National Research Council reports that students in high-performing STEM programs "have opportunities to learn science, mathematics, and engineering by addressing problems that have real-world applications." How do teachers use current issues to support students' learning of problem solving skills in authentic situations? Join us to find out!

Element #8: Designing & Engineering (DE)

It's important that students experience real-world, integrated projects in the classroom. Engineering and students' use of the design cycle bridges all of the STEM disciplines and provides students with authentic opportunities to think and act like engineers and scientists. Come find out how your colleagues are incorporating engineering design into their classrooms.

Element #9: Evidence-based Argumentation (Ar)

Students should argue for the explanations they construct, defend their interpretations of the associated data, and advocate for the designs they propose (NRC Framework, 2012). These sessions will provide ideas for the incorporation of these skills into classroom work and projects.

Element #10: The 3-dimensional Nature of STEM (3D)

Quality STEM lessons allow students the opportunity to develop deep conceptual understanding of core content/ideas to make sense of phenomena or to design solutions to a problem using one or more scientific and engineering skills and practices. Come find out how teachers are working toward meeting this daunting challenge!

Element #11: Partnerships & Community Involvement (Pa)

Interest and achievement in STEM disciplines advances Iowa's workforce and economy. External partners can accelerate the progression of STEM talent development by collaborating with schools, educators, and students to improve strategies in STEM learning. Join us to find out about successful partnerships and how you can incorporate one or more into your classes.

Element #12: Equitable & Inclusive Classrooms (Ei)

Given the urgent need to increase and diversify participation in the STEM professions, what can educators do to encourage all students to pursue STEM fields? Additionally, how can STEM classrooms ensure equity and access for all students? These sessions will help us tackle the tough issues of equity in STEM education.

Conference Keynote

12:30 P.M.

Chad Dorsey

President and CEO
of the Concord Consortium
“Unlocking the Elements of
STEM with Technology ”



Chad Dorsey is President and CEO of the Concord Consortium, which has been an innovation leader in researching and developing STEM educational technology for the past twenty years. Chad's experience ranges across the fields of science, education, and technology. In addition to overseeing a wide variety of STEM projects at the Concord Consortium, he serves as a leader in educational technology across the field on numerous advisory groups and professional workshops. Prior to joining the Concord Consortium in 2008, Chad led teacher professional development workshops as a member of the Maine Mathematics and Science Alliance. Chad has also taught science in classrooms from middle schools through college and has guided educational reform efforts at the district-wide and whole-school levels. While earning his B.A. in physics at St. Olaf College and his M.A. in physics at the University of Oregon, Chad conducted experimental fluid mechanics research, built software models of Antarctic ice streams, and dragged a radar sled by hand across South Cascade Glacier. He first met computers when his family hooked an Apple II to their fancy new color TV set, and he's been a shameless geek ever since.

Save the date! April 20—21, 2018

130th Annual Meeting Iowa Academy of Science
and the 86th Meeting of the Iowa Junior Academy of Science
Join us next year at Buena Vista University in Storm Lake.

<https://www.scienceiniowa.org/advance-programguide>



Featured Speakers



Dr. Mark McDermott

Clinical Associate Professor,
Science Education, University of Iowa

**“Using the ASSIST Approach to
Implement the Iowa Science Standards”**

Room 114 at 3:00pm

Mark McDermott has been involved in science education in Iowa for over two decades. Mark was a high school science teacher for fourteen years at New Hampton, Roland-Story, and Iowa City West. He earned a masters degree in science education from Iowa State University in 2002 and a PhD in science education from the University of Iowa in 2009. Mark was an Assistant Professor of Science Education at Wartburg College from 2009 – 2012. He worked at ACT, Inc. from 2012 – 2014 before beginning his current position at the University of Iowa in 2014. In his current role as Clinical Associate Professor, Mark is involved in teaching science methods courses for pre-service elementary and secondary education majors, serves as the STEM coordinator for the College of Education, helps coordinate STEM activities across campus, serves as the liaison to the Kirkwood Regional Center at the University of Iowa, and is involved in research related to effective STEM learning environments and multimodal communication. Recently, he has been engaged in the development and implementation of the new STEM Education Masters program at the University of Iowa. Mark is a member of the state science leadership team and is heavily involved in providing professional development for in-service teachers across the state. Mark’s wife Lindsay is an elementary teacher aide and he has two children, Mallory (15) and Jace (10).

Dr. McDermott will be an Expo contributor in rooms 106-107 from 9:00 to 10:45am, and will co-host a breakout session titled “Using the ASSIST Approach to Implement the Iowa Science Standards” in room 114 at 3:00pm.

Dr. Kris Kilibarda

State Science Consultant, Iowa Department of Education

**”Phenomenal’ Teaching and Learning with
Iowa’s New Science Standards”**

Room 114 at 9:00am



Dr. Kris Kilibarda has been active in science education for the past twenty-five years. Prior to joining the Iowa Department of Education as the state science consultant, she taught science at the high school, community college and university levels, and was an associate professor of education and education department chair at Central College. Kris has a doctorate in Educational Leadership with a focus on science education and professional development. During her time in science education, she has directed a grant-funded science professional development program for K-8 teachers, served as a Governor’s STEM Advisory Council Regional Manager, and was the Director of the Jacobson Institute for Innovation in STEM Education at Grand View University. Kris is an active member of numerous science and education-related boards and committees and has been honored with several awards for teaching and innovation at the high school and college levels. Most importantly, Kris loves engaging in conversations about teaching and learning and enjoys igniting a passion for using innovative practices and integrative models to support students’ critical and creative thinking around authentic contexts.

Dr. Kilibarda will host a breakout session titled ” ‘Phenomenal’ Teaching and Learning with Iowa’s New Science Standards” in room 114 at 9:00am.

Featured Speakers

Dr. Michael Clough

Professor of Science Education, Department of Teaching,
Learning, and Culture, Texas A&M University

“Connecting Science and Engineering Practices: A Cautionary Perspective”

Room 113 at 11:15am



Dr. Clough is a professor of science education at Texas A&M University in College Station, TX. He taught high school biology and chemistry in the upper Midwest for seven years, also serving as a science department chair. After earning his Ph.D. in science education from The University of Iowa in 1994, he continued teaching high school science until moving to a university research and teaching faculty position in 1996. He has received several awards for his teaching at the secondary school level and for both his teaching and scholarship at the post-secondary level, including the Association for Science Teacher Education (ASTE) Outstanding Science Teacher Educator of the Year award. His more than 60 peer-reviewed publications and 340 presentations and workshops address: (1) the role of history and nature of science and technology in improving STEM education, STEM teacher education, and public STEM literacy; (2) research-based pedagogical decision-making; (3) science teachers' crucial role in effective STEM education; (4) effective laboratory instruction; and (5) the synthesis, criticism, and clarification of extant knowledge and research in STEM education. He is a former president of the International History, Philosophy and Science Teaching (IHPST) organization and the Iowa Science Teachers Section of the Iowa Academy of Science. He currently serves as an Associate Editor of the Journal of Research in Science Teaching and on the Editorial Board of the journal Science & Education.

Dr. Clough will host a breakout session titled “Connecting Science and Engineering Practices: A Cautionary Perspective” in room 113 at 11:15am.



Maureen Griffin

School Improvement Leader, Administrator STEM Academy,
Hoover High School, Des Moines Public Schools

“Whole Class Inquiry: Creating Student-centered Classroom Communities”

Room 113 at 9:00am

Maureen Griffin has been a chemistry teacher and department leader at East High School in Des Moines, IA for 13 years. Most recently, Maureen has been an administrator and instructional leader at Hoover High School at in Des Moines. Maureen and her team established the Hoover High STEM Academy in 2012, and most recently received designation from the IA Governor's STEM Council as one of four STEM schools in the state of Iowa. Maureen works a professional development coordinator for Iowa State University (ISU) during the summer. In this capacity, she plans and facilitates professional learning for middle and high school science teachers as well as ISU graduate students. Maureen has been involved in research with ISU for the past 17 years in both the Chemical Engineering department as well as the Center for Bio-renewable Research. Maureen received her BS from University of Iowa and Masters in Educational Administration from Iowa State University.

Ms. Griffin will host an extended breakout session titled “Whole Class Inquiry: Creating Student-centered Classroom Communities” in room 113 at 9:00am.

Melinda Higgins

Established Scientist/Science and Technology Policy Fellow
in the Office of Economic Impact and Diversity at the U.S.

Department of Energy

“An Innovative Approach to STEM

Engagement:

Driving Equity in Access for All”

Room 113 at 2:00pm



Melinda Higgins works across program offices to support minority education, minority business development and civil rights. Her background in STEM education and research segues well with the mission of her office—working to ensure equal access to STEM opportunities for all students. Our STEM engagement and outreach efforts work to expose, engage and inspire underrepresented and underserved populations in STEM fields so they can be aware and open to pursue STEM careers for economic empowerment, especially in the energy fields. Prior to her appointment, Melinda was a STEM educator for 22 years at The Harpeth Hall School in Nashville, TN, an all-girls independent school. She taught chemistry, biology and engineering and served as the Science Department Chairperson for 10 years. Melinda also conducted Engineering research at Vanderbilt University for 7 summers and wrote, published and implemented curriculum based on her research. During her teaching tenure, she was chosen as a 2013-2014 Albert Einstein Distinguished Educator Fellow at NASA Office of Education, working at both Goddard Space Flight Center and Headquarters. Melinda worked on various projects at NASA, from interagency collaborations and experiential learning opportunities to leading a preliminary feasibility analysis focusing on a model for professional development for educators at NASA Centers. She also had the opportunity this summer to work at the U.S. Patent and Trademark Office as an Education Program Specialist, writing activity challenge curriculum to augment inventor cards and facilitating professional development opportunities for educators in Intellectual Property/STEM areas.

Melinda received her M.Ed. in Science Education from Vanderbilt University and a B.S in Chemistry from Spring Hill College.

Ms. Higgins will host a breakout session titled “An Innovative Approach to STEM Engagement: Driving Equity in Access for All” in room 113 at 2:00pm.



Craig Walter

Chemistry Instructor, Valley High School,

West Des Moines Community Schools

“Trouble at Grainly Farms:

A 3-dimensional Unit of Instruction”

Room 114 at 2:00pm

Craig Walter has over 20 years of experience teaching science in a wide variety of school settings. These range from middle school to community college and include small international K-12 buildings, large urban high schools, and virtual classrooms. Throughout his career Craig has been a student of the craft, working with aspiring teachers, new teachers, and seasoned veterans, sometimes as a coach but always as a colleague and a life-long learner. Each summer he facilitates professional development programs for those teachers immersed in research experiences at Iowa State University. Craig champions the advent of the Next Generation Science Standards and consistently looks for opportunities to successfully bring the practice of science and engineering into the classroom.

Mr. Walter will be an Expo contributor from 9:00 to 10:45am in rooms 106-107 and will co-host a breakout session titled “Trouble at Grainly Farms: A 3-dimensional Unit of Instruction” in room 114 at 2:00pm.



9:00—10:45

Conference Room A Room 106

Laura Williams & Stephanie Lane

GPAA & GHAA

Laura.williams@gpaea.org

ILEAD—Authentic Learning Experiences & Interdisciplinary Learning (E,MS,HS)

Key features will be conversations about this new program as well as give participants ideas on how to incorporate authentic learning through local partnerships into their schools to give students more authentic learning opportunities as well as prepare them for careers of the future.

Cathryn Carney

Boyden-Hull JHHS

cathryn.carney@boyden-hull.org

Melannie Hofmeyer

Teaching Genetics Through Farming Practices (HS)

The Farm Game Project is anchored in group work and challenges students to finance their own farm. Instructors will observe how students develop their skills in genetics as they become dairy farmers.

Nicole Vick

Galesburg High School - North

nicole81878@hotmail.com

National Science Teachers Association Resources (E,MS,HS)

Come see what resources NSTA has to offer. Teachers will be able to explore NSTA Journals, online resources, professional learning opportunities, and rewards program.

Eve Halligan

Iowa Academy of Science

eve.halligan@uni.edu

Craig Johnson

Student Investigations with the GLOBE Program (MS)

The GLOBE Program enables you and your class to engage in a collaborative, scientific exploration of the world around you, collaborating with teachers and students from around the world.

Amy Johannsen

Southeast Polk CSD

amy.johannsen@southeastpolk.org

Eric Hillman

Science Instructional Coaches Meet N' Greet (E/MS/HS)

Visit our Expo table where science instructional coaches will have opportunities to network, share resources and explore challenges you've faced. Let's create a lasting network that will support our work into the future!

Craig Walter

Valley High School

walterc@wdmcs.org

Trouble at Grainly Farms:

A 3-dimensional unit of instruction (MS/HS)

Your students solve the problem at Grainly Farms by creating models, identifying patterns, and developing arguments from evidence while learning ecology and evolution concepts. Great for 1:1 schools.

Tiffany Morgan

Iowa Public Television

tiffany.morgan@iptv.org

Conducting Investigations Using PBS NOVA Labs (E/MS/HS)

This session will provide an overview of PBS NOVA Labs, a free digital platform that engages learners simulations and interactives that foster authentic scientific exploration. From predicting solar storms and constructing renewable energy systems to tracking cloud movement and designing RNA molecules, learners can conduct investigations by visualizing, analyzing, and sharing the same data that scientists use.

▼ Look for the Balloons ▼



ORANGE = Elementary (E)

SILVER = Secondary (MS/HS)

BLUE = Multiple

Connie Courbat

North Tama Elementary School
courbat@n-tama.k12.ia.us

Anne Turner

Can Science and Literacy Co-Exist during Morning Rotations? (E)

Have you ever wondered how Science could happen at the same time as Literacy Rotations? This session will present student-centered activities that cover the Weather and Climate Standards in 3rd grade.

Brenda Kaufmann

North Tama County Community School
Investigation Centers for Elementary STEM and Literacy Integration with Argumentation (E)

Come explore the possibilities with centers integrating STEM and literacy activities for early childhood. Opportunities for argumentation and documentation/communication of student learning included.

Jody Stone

University of Northern Iowa
jody.stone@uni.edu

eSTEM Waterloo - Activities for Teaching Fair Tests to 3rd, 4th and 5th graders (E)

Learn about fair tests through the study of Whirligigs. All three units are part of a 9 unit series made possible through a Math Science Partnership grant entitled eSTEM Waterloo. Participants will receive electronic access to all nine eSTEM units which they are welcome to review, adapt and use in their own 3rd through 5th grade classrooms.

Mark McDermott

University of Iowa
mark-a-mcdermott@uiowa.edu

Lillie Durow

What Makes Hot Things Hot and Cold Things Cold (E)

Engaging ideas for helping students explore the relationships between heat, temperature, energy and matter will be modeled and discussed. Resources for developing similar activities will be provided.

Yen Verhoeven

Warner Graduate School of Education,
University of Rochester
yverhoev@u.rochester.edu

Social Justice and Equity Resources for the Science Classroom (E)

At this session, find materials that critically address the gender gap in STEM, an inclusive biography list of inventors and scientists, books, and website resources that embrace diversity.

Mason Kuhn

University of Northern Iowa
Mason.Kuhn@uni.edu

**Beth Van Meeteren, Angela Hewitt,
Dana Atwood-Blane**

**The Initial Engagement Activity:
K-2 Examples of Phenomena Exploration to Start a Unit (E)**

In this breakout session we will discuss ways to begin a unit through phenomena activity called the Initial Engagement Activity. We will also bring materials so participants can try out the IEA.

Vonna Watson

North Tama County Community School
vwatson@n-tama.k12.ia.us
Ramps and Pathways (E)

Participants will learn and explore the concept of force and motion through hands on integrated STEM interaction with ramps, building blocks and objects. The possibilities are endless.

Breakout Sessions by Element

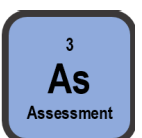
see pages 18-25 for full descriptions



- 9:00—9:45 Astronomy that Makes Sense: Helping Students Hear and Feel the Outcomes (room 215)
- 10:00—10:45 Penguins in 3D (room 114)
- 11:15—11:45 Get Organized: Using Atom Models to Assess Understanding of the Periodic Table (room 108)
- Computer Science in Middle School (room 109)
- 2:00—2:45 Reproduction—Breeding Critters, More Traits (room 107)
- Next Generation Science Standards: Conceptual Shifts (room 115)
- 2:00—3:45 Making Learning 3-dimensional (room 208)
- 3:00—3:45 Activities with Atoms & Molecules (room 106)
- Promoting Model-based Reasoning in the Physical Sciences (room 109)



- 9:00—9:45 Earth Science Standards & You (room 107)
- Help Your Students SOAR with Real Data (room 109)
- Plant Phenomenon (room 112)
- “Phenomenal” Teaching & Learning with Iowa’s New Science Standards (room 114)
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- 3:00—3:45 Activities with Atoms & Molecules (room 106)
- Technology Tools Driving Deep Thinking (room 107)
- Iowa Students Engaging in Real Science in their Community (room 112)
- Using the ASSIST Approach to Implement the Iowa Science Standards (room 114)
- Iowa STEM BEST—A Model to Incorporate Businesses to meet Elementary NGSS Standards (room 115)



- 9:00—10:45 Whole Class Inquiry: Creating Student-centered Classroom Communities (room 113)
- 10:00—10:45 Exploring Authentic 3D Printing Classroom Ideas (room 109)
- 11:15—11:45 Get Organized: Using Atom Models to Assess Understanding of the Periodic Table (room 108)
- Bullet Journals for Teachers
- 2:00—2:45 Reproduction—Breeding Critters, More Traits (room 107)
- 2:00—3:45 ARIS: Augmented Reality and Interactive Storytelling (room 209)
- Put Me In, Coach! (room 214)
- 3:00—3:45 Promoting Model Based Reasoning in the Physical Sciences (room 109)



- 9:00—9:45 Plant Phenomena (room 112)
- Rebuild Nepal Education (room 115)
- Notebooking in the Science Classroom (room 208)
- Astronomy that Makes Sense: Helping Students Hear and Feel the Outcomes (room 215)
- 9:00—10:45 Supporting STEM Students with Personalized Learning (room 209)
- 10:00—10:45 Using Research Projects to Meet the Iowa Core Science Standards (NGSS) (room 112)
- Penguins in 3D (room 114)
- Supporting Student Investigations through Integrated STEM and Literacy Events (room 208)
- 11:15—11:45 State Hygienic Lab Student Mentorship Program (room 114)
- Using Iowa Data to Implement Standards: A Flexible Curriculum (room 214)
- 2:00—2:45 Productive Mis-steps During Inquiry Science (room 106)
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- Puzzling Out the Nature of Science from K-12 (room 112)
- 2:45—3:45 Making Learning 3-dimensional (room 208)
- ARIS: Augmented Reality and Interactive Storytelling (room 209)
- 3:00—3:45 Teaching Nature of Science in Elementary & Middle Grades: Strategies & Resources (room 108)
- Promoting Model-based Reasoning in the Physical Sciences (room 109)



9:00—9:45
11:15—11:45

Best Practices in STEM Education: Learn from 2015-17 IOWA STEM Teacher Recipients (room 214)
Computer Science in Middle School Science (room 109)
Bullet Journals for Teachers (room 115)



9:00—9:45

9:00—10:45
10:00—10:45

11:15—11:45

2:00—2:45

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An Innovative Approach to STEM Engagement: Driving Equity in Access for All (room 113)



9:00—9:45

9:00—10:45
10:00—10:45

11:15—11:45

2:00—2:45

2:00—3:45
3:00—3:45

STEM Resources—Online & Regional (room 108)
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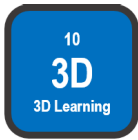
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Breakout Sessions by Element

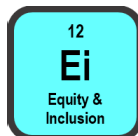
see pages 18-25 for full descriptions



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“Phenomenal” Teaching & Learning with Iowa’s New Science Standards (room 114)
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#ISTSElements2017

My Schedule of Learning

	First Session Choice	Second Session Choice
Breakout #1 9:00—9:45		
Breakout #2 10:00—10:45		
Breakout #3 11:15—11:45		
Breakout #4 2:00—2:45		
Breakout #5 3:00—3:45		



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www.scienceiowa.org

BRC 50, University of Northern Iowa Cedar Falls, Iowa 319-273-2021 iascience@uni.edu

Breakout Session 1 9:00—10:45

As, CC, RI, EI
Room 113

Maureen Griffin
Hoover High School
maureen.griffin@dmschools.org

As, CC, RI, EI (MS/HS)

Whole Class Inquiry - Creating Student Centered Classroom Communities

Consider the shift in your classroom when you make the choice to turn your typical classroom structure upside down and give students more opportunities to work together on real-world problems.

St, CI, RI, EI
Room 209

Denise Krefting
AEA Learning Online
dkrefting@aeapdonline.org

Deborah Cleveland

St, CI, RI, EI (MS/HS)

Supporting STEM Students with Personalized Learning

Explore how the Student Personalized Learning System can support students in STEM. Learn more about how this system supports STEM and ways to personalize and differentiate learning for students.

Breakout Session 1 9:00—9:45

Panel
Room 214

Kacia Cain, 2015
Mike Wedge, 2015,
Reagan Boeset, 2016,
Keith Juelfs, 2017,
Brett Roberts, 2017,
Chelsie Slaba, 2017,
Heather Anderson, 2017

Best Practices in STEM Education: Learn from 2015, 2016, and 2017 I.O.W.A. STEM Teacher Recipients

In this interactive panel, 2015/2016/2017 recipients of the STEM Council's IOWA STEM Teacher Award (sponsored by Kemin Industries) will share insights on STEM curriculum/partners in their classes.

St, RI, Ar
Room 109

Peggy Christensen
Heartland AEA
pchristensen@heartlandaea.org
Kay Neumann,
Linette Bernard

St, RI, Ar (MS/HS)

Help Your Students SOAR with Real Iowa Data

Help your 6-12 grade students use Iowa SOAR data (soarraptors.org) to investigate what's happening to our birds. Follow eagles being rescued and rehabilitated, through photos, x-rays, and data.

CI, CC, DE, Ar
Room 208

Hannah Haarhues-Casey
Lewis Central Middle School
hhaarhues-casey@lewiscentral.org
Kelly Carr

CI, CC, DE, Ar (E/MS)

Notebooking in the Science Classroom

Keeping a notebook provides students an opportunity for modeling, evidence-based arguments, and collaborative opportunities. Kids become real scientists that use their notes to develop and explore.

St, CI, CC, RI, 3D
Room 112

Cindy Hall
Iowa Agriculture Literacy Foundation
chall@iowaagliteracy.org
Will Fett

St, CI, CC, RI, 3D
(E/MS/HS)

Plant Phenomena

Take a close look at the structure & function of corn & soybean plant parts, and discover the phenomena behind why skinny cornstalks stand tall in wind, how soybeans germinate in hard soil, and more.

Breakout Session 1 9:00—9:45

Kris Kilibarda
Iowa Department
of Education
kilibardak@gmail.com

St, 3D (E/MS/HS)

“Phenomenal” Teaching and Learning with Iowa’s New Science Standards

This session will highlight websites educators can use to select potential phenomenon upon which to base their units and will introduce some tools/resources for 3D learning opportunities.

**St, 3D
Room 114**

Ernie Schiller
Retired Teacher of the Year
ernestschiller@hotmail.com

CI, CC, RI, Pa (E/MS/HS)

Rebuild Nepal Education

The auspicious & magical country of Nepal is interested in improving their science education. A poor country devastated by the earthquake of 2015 is in need of volunteers & donations. Come hear & see what you can do.

**CI, CC, RI, Pa
Room 115**

Mary Trent
NW STEM Regional Manager
mtrent@iowalakes.edu

RI, DE (E/MS/HS)

STEM Resources - Online & Regional

Fill your STEM Resources bucket!! Participants will have a hands-one opportunity to learn about some STEM online resources and some regional resources to help support STEM in the classroom.

**RI, DE
Room 108**

Jesse Wilcox
Drake University
jwilcox.23@gmail.com
Dan Chibnall

M, St, CI (E/MS/JHS)

Astronomy that Makes Sense: Helping students hear and feel the cosmos

Come see how you can engage students using 3D printed objects and sounds from the cosmos to help students understand gravity, escape velocity, and tools astronomers use to understand the cosmos.

**M, St, CI
Room 215**

Janis Hall
Iowa Limestone Producers
jhall@limestone.org

Randy Olson
St (E/MS/HS)

Earth Science Standards & You

Program and Activities for New Earth Science Standards.

**St
Room 106**

The success of this conference is due to the Fall Conference Committee and many other amazing volunteer supporters.
Thanks to all those volunteers!



Do you have information that you want to get out to the STEM teachers of Iowa?
Exhibit in the exhibit hall at the ISTS Fall Conference.
Commercial and non-commercial booths available.
Please contact the Iowa Academy of Science Email: iascience@uni.edu

Breakout Session 2 10:00—10:45

Room 115
St, RI

Jenny Boldt
Solon High School
jboldt@solon.k12.ia.us
Dawn Posekany
St, RI (HS)

Exposing Students to Real World Issues Through Literacy

Modeling of reading strategies for fostering comprehension of complex scientific texts and exposing students to real world issues.

Room 215
CC, RI, Ar

Rebekah Domayer
State Hygienic Laboratory of the
University of Iowa
rebekah-domayer@uiowa.edu
Erna Mahmutovic
CC, RI, Ar (MS)

Field of Streams: A Day in the Life of a SHL Limnologist

Come learn how the State Hygienic Laboratory at the University of Iowa partners with 7th grade science teachers on a real-world, career-focused water quality lesson called, "Field of Streams."

Room 208
St, RI, Ar

Sara Nelson
Iowa State University
sdnelson@iastate.edu
Nicole Hanson
CI (E)

Supporting Student Investigations Through Integrated STEM and Literacy Events

Curious Candy—Inventor's Hat! Join us to learn more these and other engaging STEM-literacy investigations that were recently piloted in Iowa. Perfect for anyone that works with grades PK-5!

Room 114
M, CI, RI, 3D

Gayle Ramaeker
Lamoni CSD
mrsgramaeker@gmail.com
Liz Carpenter
M, CI, RI, 3D (E)

Penguins in 3D

Come see a 3D unit that combines Chemistry, Life, and Earth Science for K-2 students using a model to represent the relationship between oil and water and how penguins live in their environment.

Room 214
Pa

Alicia Schiller Haynes
Central Lee High School
aschiller@centrallee.org
JameySue Smith
Pa (E/MS/HS)

Incorporating NASA Resources into the STEM Classroom

Learn about the Iowa Space Grant Consortium and our experience with NASA. We will feature resources provided by NASA utilizing Problem Based Learning for all STEM teachers and all age levels.

Room 109
As, RI, DE

Marcy Seavey
University of Northern Iowa
seavey@uni.edu
As, RI, DE (MS/HS)

Exploring Authentic 3-D Printing Classroom Ideas

Explore 7 ways additive manufacturing has changed industry. Use a NASA themed design challenge to assess unique 3D prototypes submitted by Iowa educators. Discuss integrating modeling into class.

Room 112
St, CI, RI, Ar

Nadine Weirather
Central Lee School District
nweirather@centrallee.org
St, CI, RI, Ar (MS/HS)

Using Research Projects To Meet the Iowa Core Science Standards (NGSS)

Hear from an award-winning teacher how science fairs, citizen science projects, and other research opportunities support the 3D learning and other goals of NGSS. Ideas and templates will be provided.

Room 108
CC, RI, Pa

Jeff Weld
Governors STEM Advisory
Council
Weld@IowaSTEM.gov
CC, RI, Pa

In Iowa, STEM Starts with Science Teachers: Opportunities to engage

Ways for teachers not yet involved in STEM to join in activities of the Governors STEM Advisory Council, and new and additional ways for current and past STEM partners to get more involved.

AM Exhibitor Time

10:45—11:15

Breakout Session 3 11:15—11:45

Bennett Brown

Iowa City CSD
brown.bennett@iowacityschools.org

Maurine Neiman

M, Ld (MS)

Michael Clough

Texas A & M University
mclough@tamu.edu

St, DE (E/MS/HS)

Hallie Edgerly

Adel-DeSoto-Minburn MS
hedgerly@adm.k12.ia.us

Jaclyn Easter, Sarah Hunt,
Rylee Smith

St, CC, DE (MS)

Nanette Fladung

Bishop Heelan High School
fladungn@bishopheelan.org

As, Ld, Ei (E/MS/HS)

Matthew Hennes

Clarke Community High School
matthewhennes.2@gmail.com

Walker Adams

M, St, As (HS)

Beth Hochstedler

State Hygienic Laboratory of the
University of Iowa

beth-hochstedler@uiowa.edu

Erica Larson, Rick Bonar

CI, RI, Pa (MS/HS)

Computer Science in Middle School Science

Google named Iowa City CSD among 30 US sites for computer science PD. We explain how we're integrating CS into grade 7/8 math and science courses and why. Participants try two activities.

Connecting Science and Engineering Practices: A Cautionary Perspective

While including engineering concepts and practices in the science curriculum have merit, significant and legitimate concerns exist with the kind and level of emphasis being placed on engineering.

Boat Races: Motion, Forces, and Engineering Design

Participants will walk through these science teachers' classroom project of designing boats from recycled materials to incorporate NGSS standards of motion and forces, as well as engineering design.

Bullet Journals for Teachers

An infinitely flexible planner to keep track of multiple preps, lesson plans, MTSS groups, and more. All you need is a notebook and pen. Very simple or a creative outlet, it keeps you organized.

Get Organized: Using Atom Models to Assess Understanding of the Periodic Table

Engage in a formative assessment designed for HS-PS1-1. Students will organize atom models into a periodic table based on patterns they see. A great way to observe student progress toward HS-PS1-1.

State Hygienic Laboratory Student Mentorship Program

Each year laboratorians at the State Hygienic Laboratory at the University of Iowa mentor students in grades 6-12 on their science projects through a selection-based, Student Mentorship Program.

M, Ld
Room 109

St, DE
Room 113

St, CC, DE
Room 208

As, Ld, Ei
Room 115

M, St, As
Room 108

CI, RI, Pa
Room 114

Room 109

Breakout Session 3 is continued on next page

Breakout Session 3 11:15—11:45

Room 215

RI, Pa

Jason Lang
Iowa STEM Teacher Externships
lang@iowastem.gov
Meghan Lang

RI, Pa (E/MS/HS)

Iowa STEM Teacher Externships

Come learn about the Teacher Externships program and from past participants, including the types of projects completed and classroom takeaways, plus how to get involved next summer!

Room 214

St, CI, Ar

Andrea Malek
University of Iowa
andrea-malek@uiowa.edu
Ted Neal

St, CI, Ar (MS)

Using Iowa data to implement standards: a flexible curriculum

Our team is using local, Iowa data to create an 8th grade curriculum available to any teacher. At this session, we'll share an overview and more, including a website available for all.

Room 112

RI, Pa

Jordan Menning
Northwest Area Education
Agency
jmenning@nwaea.org

RI, Pa (E/MS/HS)

How to Integrate Real-World Connections for Student Learning

Have you have interest in connecting student learning to real-world situations? Come check out how to integrate real-world situations and local business connections into your classroom.

Room 209

DE

Kristina Tank
Iowa State University
kmtank@iastate.edu
Michael Dupont

DE (E)

What Makes an Effective Elementary Engineering Design Lesson

Elementary engineering provides an opportunity for authentic STEM. This session highlights an engineering design challenge and the characteristics that lead to successful engineering design lessons.

Room 107

St, CC, Ar

Kristin Rademaker
Illinois Science Teachers
Harlem High School
krad70@gmail.com

St, CC, Ar (E/MS/HS)

Introduction to Productive Talk

The true goal of facilitating scientific discourse in the classroom is to help students develop their voice as scientifically literate members of their community. Learn how to grow your students' ability to: pose probing questions, challenge the ideas of their peers, and engage in productive discourse.

Awards Luncheon and Keynote Address

11:45 — 1:30

Chad Dorsey

President and CEO of the Concord Consortium

PM Exhibitor Time

1:30—2:00

Breakout Session 4 2:00—3:45

Dana Atwood-Blaine
University of Northern Iowa
dana.atwood-blaine@uni.edu
Audrey Rule

As, CI, CC, 3D (MS/HS)

ARIS: Augmented Reality and Interactive Storytelling

This session shows you how to use ARIS, an open-source location-based game development platform, to create mobile games that will enable you to connect real-world experience with classroom lessons.

**As, CI, CC, 3D
Room 209**

Kara Hageman
University of Iowa
kara-hageman@uiowa.edu

St, As (MS/HS)

Put Me in Coach!

An athlete sits on the sidelines of a big game, leaning forward, feet tapping, ready to go in at any moment. This is a common scenario in the gym or on the field. But what about in the classroom?

**St, As
Room 214**

Amy Johannsen
Southeast Polk CSD
amy.johannsen@southeastpolk.org

Eric Hillman

M, CI, 3D (E/MS/HS)

Making Learning 3 Dimensional

Participants will be immersed in a lab activity to look for evidence of 3-D learning. Participants will walk away with the experience of how to enhance existing lessons by using an alignment tool.

**M, CI, 3D
Room 208**

Muhammad Spocter
Des Moines University
Muhammad.spocter@dmu.edu
Kacia Cain

RI, DE, 3D, Pa (HS)

Neuroanatomy in an Afternoon

The NeuroSMART program provides high school students with college level experience in neuroanatomy. Here we provide a hands-on opportunity to learn about the human brain, its structure and function.

**RI, DE, 3D, Pa
Room 215**

Breakout Session 4 2:00—2:45

Darin Christianson
Lab-Aids/SEPUP
darin@lab-aids.com

M, St, As, CI, CC, RI, 3D (MS)

Reproduction - Breeding Critters - More Traits

Participants model and explain additional patterns of inheritance as they explore cause-and-effect relationships for additional traits of the critters. These patterns help them model and explain the wide variation that can result from sexual reproduction.

**M, St, As, CI,
CC, RI, 3D
Room 107**

Will Fett
Iowa Agriculture Literacy
Foundation
wfett@iowaagliteracy.org

Cindy Hall

St, RI, Ar, 3D (E/MS/HS)

What's the Big Deal? Nitrates and Water Quality

This session will look at a solutions oriented approach to water quality and nutrient management in Iowa's waterways. Learners will investigate what farmers are doing to minimize nutrient runoff.

**St, RI, Ar, 3D
Room 109**

Breakout Session 4 is continued on next page

Breakout Session 4 2:00—2:45

Room 113

Ei, CC

Melinda Higgins
U.S. Department of Energy/
Fellow
melinda.higgins@hq.doe.gov

Ei, CC (E/MS/HS)

An Innovative Approach to STEM Engagement— Driving Equity in Access for All

Participants will have the opportunity to engage their students with cutting-edge research and technology while exposing them to the wonder of the Department of Energy's (DOE) National Laboratories.

Room 108

RI, DE, 3D

Erin Hollister
Morris Elementary (DMPS)
erin.hollister@dmschools.org
Jaclyn Easter

RI, DE, 3D (E)

Where have the birds gone? Engineering Solutions to Authentic Problems in Elementary Science Classroom

This hands-on activity explores an authentic, integrated engineering and life science unit in an elementary classroom. Science and engineering practices and NGSS standards will be addressed.

Room 106

St, CI, Ar

Jacob Pleasants
Iowa State University
jbleasa@iastate.edu

St, CI, Ar (MS/HS)

Productive Missteps During Inquiry Science

When students make decisions in laboratory investigations, they don't always make ideal choices. In this session, we will explore how to productively use those missteps as opportunities for learning.

Room 112

St, CI, CC

Yen Verhoeven
Ames CSD; Warner School of
Graduate Education,
University of Rochester
yverhoev@u.rochester.edu

Sarah Bappe

St, CI, CC (E/MS/HS)

Puzzling out the Nature of Science from K-12

Through the use of puzzles, this inquiry-based activity is a powerful way to engage and promote student-led conversations around the nature of science. Discussions include adaptations to suit K-12.

Room 115

M, St, RI

Nicole Vick
Galesburg High School - North
nicole81878@hotmail.com

M, St, RI (E/MS/HS)

Next Generation Science Standards: Conceptual Shifts

Examine NGSS, three dimensional learning, and how to break the standards down using the K-12 Framework for Science Education and Next Generation Science Standards Volumes 1 and 2.

Room 114

RI, Ar, 3D

Craig Walter
Valley High School
walterc@wdmcs.org
Nick Peters

RI, Ar, 3D (MS/HS)

Trouble at Grainly Farms: A 3-dimensional unit of instruction

Your students solve the problem at Grainly Farms by creating models, identifying patterns, and developing arguments from evidence while learning ecology and evolution concepts. Great for 1:1 schools.

Breakout Session 5 3:00—3:45

Room 106

M, CI, 3D

David Doherty
Atomsmith®
Classroom Online: Interactive,

M, CI, 3D (HS-M, St)

Dynamic and Physically Accurate Models & Activi- ties with Atoms and Molecules

Teaching chemistry depends on the ability to see 3D shapes and interactions of particles we can't actually see. Atomsmith® Classroom Online makes models accessible to intro chemistry students, Use Atomsmith Classroom Online to explore models of atomic structure, bonding, reactions, polarity, IMFs & more. (Handouts provided.)

Breakout Session 5 3:00—3:45

Kristine Bullock

Iowa Governor's STEM Advisory Council

kristine-bullock@uiowa.edu

Naomi DeWinter

St, RI, Pa (E/MS/HS)

Iowa STEM BEST - A model to incorporate businesses to meet elementary NGSS standards

This session will highlight Muscatine CSD's partnership with Muscatine Community College and local businesses to meet NGSS standards in 4th and 5th grade as part of their STEM BEST award.

Jolie Pelds

Science Center of Iowa

jolie.pelds@sciowa.org

Ellie Willhoit

RI, 3D, St (E/MS - RI, 3D, St)

Technology Tools Driving Deep Thinking

Discover ways of embedding computational thinking and 21st Century workforce skills through technology application programs such as Pint Size Science, Making STEM Connections and SCI Girls Code. Inquiry and project based learning combined with topics like computer science, robotics, coding and programming, can bolster deep thinking and understanding to create future prepared students.

Mark McDermott

University of Iowa

mark-a-mcdermott@uiowa.edu

Katie Weiss

St, Ar, 3D (E/MS/HS)

Using the ASSIST Approach to Implement the Iowa Science Standards

Argument-based strategies for STEM Infused Science Teaching (ASSIST) provides an approach built on the Science Writing Heuristic to develop NGSS-aligned learning environments for all grade levels.

Dawn Posekany

Solon High School

dposekany@solon.k12.ia.us

Miranda Kral

Pa (HS)

Connecting Students with the Community Through the Literature of Science

Explore having a class lead a book discussion with community members. Nonfiction holds great potential for growth and understanding when issues can be dissected across generations and backgrounds.

Collin Reichert

Ames High School

collin.reichert@ames.k12.ia.us

M, As, CI, Ar (E/MS/HS)

Promoting Model Based Reasoning in the Physical Sciences

Research indicates that the majority of experiences students have in traditional science classrooms do not accurately represent the nature of science. How might we better represent science in class?

Jesse Wilcox

Drake University

jwilcox.23@gmail.com

Alaina Lake

CI, RI, 3D (E)

Teaching Nature of Science in Elementary and Middle Grades: Strategies and Resources

Come see how you can teach elementary and middle school students the nature of science through engaging activities. This session will explore how help students deeply understand how science works.

Susanna Ziemer

University of Iowa

College of Education

susanna-herder@uiowa.edu

Ted Neal

St, RI, Ar, 3D, Pa (E/MS/HS)

Iowa Students engaging real science in their community: contextualizing Iowa Science Standards through local inquiry

Teachers experience a phenomena based unit of nine eighth grade standards focusing on "Historical Land Use Change" in Iowa. Experiment with inquiry driven approaches in your classroom.

St, RI, Pa

Room 115

RI, 3D, St

Room 107

St, Ar, 3D

Room 114

Pa

Room 113

M, As, CI, Ar

Room 109

CI, RI, 3D

Room 108

St, RI, Ar, 3D, Pa

Room 112

ISTS Awards

The mission of the Iowa Academy of Science is to further scientific research, science education, public understanding of science and recognize excellence in these endeavors. One of the ways to recognize this excellence is by awards. We encourage you to nominate a deserving individual or corporation for an appropriate award.

The Friend of Science (FOS) Award - Individual – ISTS recognizes with a plaque an individual or group, within the state, who has made significant contributions to ISTS and/or to science education at the local, regional or statewide level.

The Friend of Science (FOS) Award – Corporate – ISTS recognizes with a plaque a corporation, company, coalition, foundation or government entity who has made significant contributions to ISTS and/or to science education at the local, regional or statewide level.

The Outstanding Service Award (OSA) – ISTS recognizes with a plaque an ISTS member who has made sustained, extraordinary contributions to ISTS and/or to science education at the state and/or national level.

Excellence in Science Teaching Awards (ESTA) – The Iowa Academy of Science (IAS) awards to outstanding teachers of all grade levels and areas of science, teachers who are recognized for their work and innovations in science education. The core of the Award is \$200 for the teacher and a Plaque. Nominations are accepted in the following categories:

- Physical Science (physics, chemistry and physical science)
- Life Science (biology, anatomy/physiology, life science)
- Earth/Space Science/Environmental Science
- General/Multiple Science (integrated science, interdisciplinary courses, multiple preps)
- Middle School/Junior High Science
- Elementary Science (two awards may be given/year)
- Science Supervisory - (District, private, AEA, museum, naturalist, etc.)

Excellence in Science Teaching Award



Life	Supervisory	Physical	Middle	General	Elem #1	Elem #2	Earth
Kevin Schneider	Dawn Del Carlo	Holly Garcia	Romona Satre	Casey Giraud	Vonna Watson	Brenda Kaufmann	Hallie Edgerly

2017 ESTA winners from left to right. Group photo by Larry Stone.

2017 ISTS Outstanding Service Award

Mark McDermott, University of Iowa



Mark A. McDermott has been involved in science education in the state of Iowa in one way or another for over twenty years. He was a high school science teacher at New Hampton High School, Roland-Story High School, and Iowa City West High School for 14 years. He was an assistant professor of science education at Wartburg College and is now a clinical associate professor of science education at the University of Iowa. In these positions he has taught methods courses for both elementary and secondary pre-service teachers. He has also been involved in multiple professional development programs across the state and has been involved in carrying out and presenting research on different science education topics at local, state, national and international conferences. He has been a member of the State Science Leadership team, specifically involved with helping coordinate the efforts of science teacher preparation providers across the state, including helping to host an annual STEM pre-

service teacher conference at the University of Iowa. Mark has served on the Governor's STEM Advisory Council. He has been involved in the statewide implementation and adoption of the new Iowa Science standards. Mark is also involved in helping coordinate STEM activities both in the College of Education at University of Iowa, and across the entire University of Iowa campus.

Jody Stone, University of Northern Iowa

Jody's service contributions have centered on her curriculum developments efforts at UNI. She has written and received grant funding for the development of curriculum projects which include CRISTAL, BIOMES, GEOMES, and PROBE science – all of which are inquiry-based science activity guides. Many teachers around the state have attended Jody's curriculum workshops and use activities from these projects in their classrooms. Most recently she developed NGSS units for grades 3-5, as part of a project entitled eSTEM Waterloo. Jody is a past recipient of the Presidential Award for Excellence in Math and Science Education and is a Nationally Board Certified teacher. She is currently a professor of science education at UNI.

It is quite evident that Dr. Jody Stone has rendered significant service to Science Education in Iowa and is a very deserving choice for the ISTS Outstanding Service Award (OSA).



Fellows of the Iowa Academy of Science



A Fellow is elected by the Board of Directors from those members who have provided meritorious service to the Academy and effective promotion of science in Iowa. Fellows remain as long as they maintain membership. This is an honor with the same privileges and responsibilities as a Professional Member. The Board of Directors solicits nominations for Fellows from the membership in the fall of each year.

Please consider nominating a worthy candidate today!

For more information, contact IAS at iascience@uni.edu.

2017 Friend of Science Awards

Brian Lyons, Traer Municipal Utilities

Annually, the North Tama fifth grade science classes, currently under the direction of teacher Lisa Chizek, tour the Traer Municipal Utilities' water treatment plant and well house, as well as the waste water treatment lagoons. As plant foreman, **Brian Lyons** gets to spend a couple hours with each of the sections of students. Mr. Lyons says that these are some of the most enjoyable days he has all year!

Mr. Lyons loves to see the kids as they start to understand the long journey their drinking water takes. They learn about the Jordan aquifer from which the raw water comes and follow it through the entire treatment process. Brian emphasizes the importance of disinfection, assuring the kids that an occasional chlorine smell is not a bad thing. The groups do some water testing and Mr. Lyons explains how, using the results, adjustments are made. Brian says, "Some of the questions the children ask about the plant, remind me that most folks really have little idea what we do here."

The part of the tour the kids (and Brian) like the best is the waste treatment lagoons. The students get to see the raw waste coming in and the clean water going out. Mr. Lyons adds, "I'm always amazed at the good questions the kids ask while at the lagoons, they are truly interested in the process and the hydrological cycle. We emphasize that aside from the electricity used to power the blower motors, an aerated lagoon is a completely natural process, not relying on any chemicals. We explain flow metering and testing, a great reminder that in the water/ waste water field, we use math every day. I truly look forward to the fifth graders annual field trips!

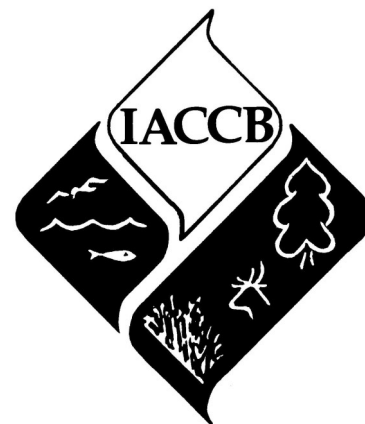
It can be easily seen that Brian Lyons representing the Traer Municipal Utilities' water treatment plant, is a great choice as the ISTS, Individual Friend of Science Award, for 2017.



Iowa's County Conservation System

Iowa's County Conservation System was established in 1955 by the Iowa Legislature, and currently manages over 1,850 parks, natural areas, trails and preserves across all 99 counties in Iowa. The success and expansion of the system has been truly amazing - spurred by tremendous local support, funding and volunteers. Of the 625 employees, a full one-third of the staff are involved in environmental & outdoor education, historical interpretation and providing lifelong learning opportunities.

Each year - the system offers over 26,000 programs and events statewide that are attended by more than 760,000 participants. Many of these programs and events are anchored at one of the 65 wonderful, outdoor learning centers scattered across the counties - with 11 more in the planning or construction phases. County Conservation programs, outdoor recreation opportunities and facilities are a great asset to the local quality of life, workforce development & retention, and have a significant economic impact for Iowa's economy. In 2009, the system launched their first collective website effort providing online registration for events, reservation of facilities, interpretive information and public access, via one website to the entire 99-county system. The rewards for this website effort have been many - 74,000 registered users, 2.3 million annual site visitors, millions of downloads of educational information .



The ICCS has received recognition awards from the Iowa Tourism Office, the Iowa State Association of Counties, and the National Association of Counties. The County Conservation is proud to fulfill their unique niche - both locally and regionally - where we provide a thriving blend of outdoor conservation education and outdoor recreation. It is clear that the ICCS is a great choice for the Friend of Science Award.

2017 Friend of Science Awards

Iowa Children's Water Festival

The **Iowa Children's Water Festival (ICWF)** was first organized in 1996. It was originally modeled after the Nebraska Children's Groundwater Festival which inspired this unique educational event. Since that time the Iowa Festival has run continuously celebrating its 20th year in 2016!



The Festival's mission is to "Cultivate in every child and adult who participates in the Festival an understanding of and appreciation for the water they use and the environment in which they live." With this mission in mind, the Iowa Children's Water Festival has now provided an experiential event for more than 22,000 students throughout the state of Iowa. It is through these efforts that Festival organizers hope to impact students' thoughts and actions regarding water, Iowa's most precious resource. Seeking knowledgeable presenters and exhibitors is critical to the annual Festival!

Each of the exhibitors establish booths and exhibits that are educational and yet provide opportunities for hands on activities while providing another avenue for teaching the students the significance of water and wastewater in our environment! In addition to the students and their teachers, the Iowa Children's Water Festival enlists nearly 250 volunteers each year to help host the event. The ISTS is proud to recognize the Iowa Children's Water Festival with the 2017 Friend of Science Education Award.

2017 Exhibitors

 SCIENCE CENTER OF IOWA & BLANK IMAX DOME THEATER	Science Center of Iowa Patrick Rice 515-274-6868 ext 234	patrick.rice@sciowa.org www.sciowa.org
 Teachers Going green	Teachers Going Green Shelly Johnson	shellyjohnson010@gmail.com www.teachers-going-green.com
	Iowa Agriculture Literacy Cindy Hall 515-331-4183	chall@iowaagliteracy.org www.iowaagliteracy.org
 ICEC IOWA CONSERVATION EDUCATION COALITION	Iowa Conservation Ed Coalition Alicia Vasto 336-538-6238	execicec@gmail.com iowaee.org
IOWA STATE UNIVERSITY	Iowa State University Robert Valek 719-661-4874	rvalek@iastate.edu www.iastate.edu
 PARAMETRIC STUDIO Designed for Learning	Parametric Studio Christopher Whitmer 515-520-7382	whitmer@parametricstudioinc.com parametricstudioinc.com



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Iowa Governor's STEM Advisory Council

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Terry Ausman

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Project Lead the Way



Debra Kearney

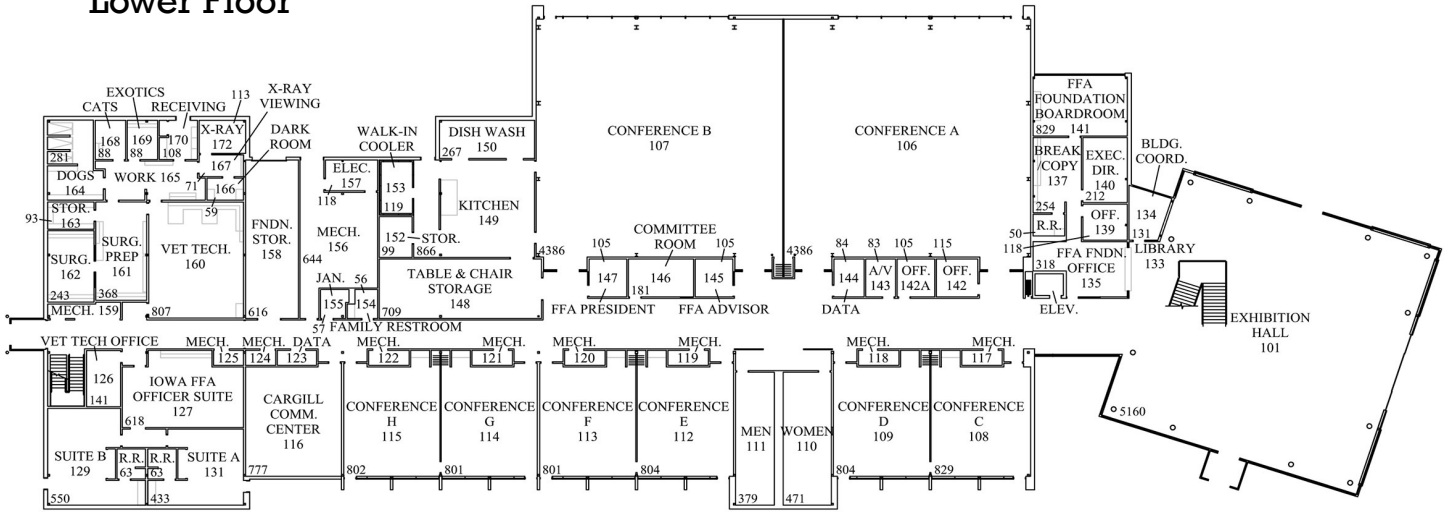
dkearney@nutrientsforlife.org

nutrientsforlife.org

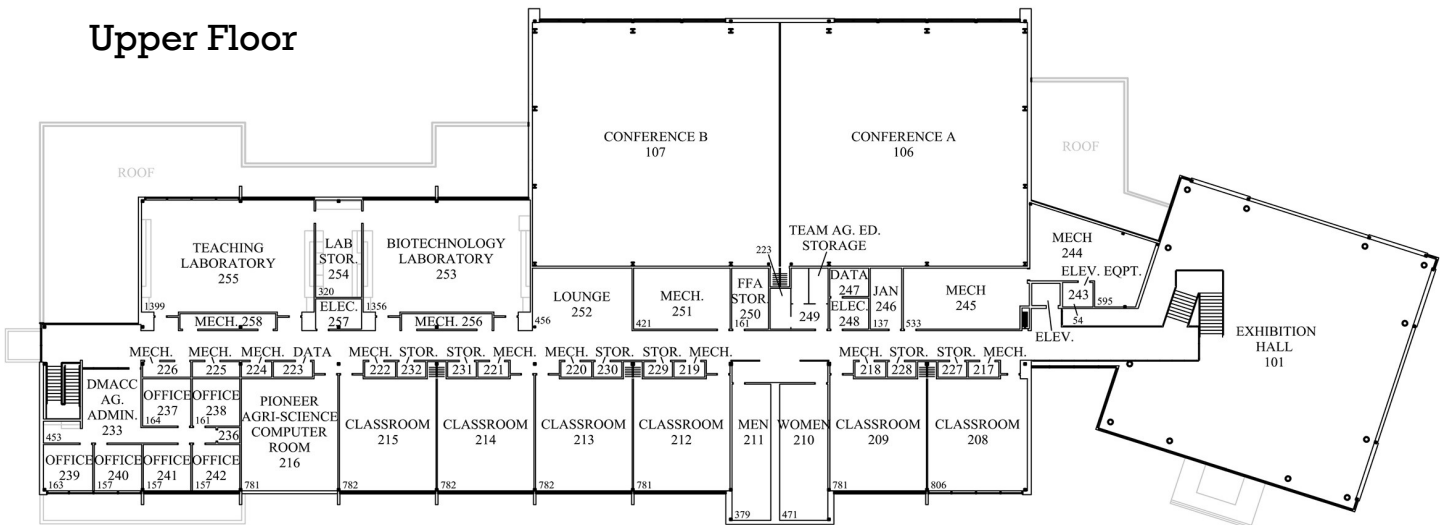
Nutrients for Life

FFA Building DMACC—Ankeny Campus

Lower Floor



Upper Floor



The Iowa Academy of Science is established to further scientific research and its dissemination, education in the sciences, public understanding of science and recognition of excellence in these endeavors.

Affiliated with the American Association for the Advancement of Science (AAAS), the National Science Teachers Association (NSTA), National Association of Biology Teachers (NABT), the American Junior Academy of Sciences (AJAS), the Iowa Space Grant Consortium (ISGC), the Iowa Math and Science Education Partnership and the Iowa Mathematics and Science Coalition.

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