

2019 PreK-8 Science Education Update Conference ---- Program “At-A-Glance”

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| <u>8:00 am</u> | <u>Registration & Exhibits</u> | Northwest Hallway |
| <u>8:30-9:30 am</u> | <u>Concurrent Sessions I</u> | |
| HH 43 Bob Friedel | Improve Your Use of the Five Innovations - NGSS | 5-8 |
| HH 44 Ronda McKee & Mendy Sowers | What a "Waterful" World | PreK-5 |
| HH 62 John Zenchak, Juell Markowski & Karissa Dobson | A Bright Idea: Using a Scientific Practice to Teach Science Content in NGSS Science | PreK-5 |
| <u>9:40 -10:40 am</u> | <u>Concurrent Session II</u> | |
| HH 3 Julie Ann Bice & Mary McMahan | Saving the Symbol of Illinois....the Magnificent Monarch! | PreK-8 |
| HH 42 Kathy Mainz | Eat It Up....Animal Mouth Structures | 3-5 |
| HH 59 Joe Bauer | Materials and Programs from the Illinois Department of Natural Resources to Support Science Teaching | PreK-8 |
| <u>10:40-11:00 am</u> | <u>Exhibits & Hospitality</u> | Northwest Hallway |
| <u>11:00-12:00 pm</u> | <u>Concurrent Session III</u> | |
| HH 43 Bob Friedel | Explore How We Can Provide Freshwater to Those in Need with Smithsonian Science | 3-8 |
| HH 44 Stacy McQueen | Wild About Weather | PreK-3 |
| HH 62 Matthew Hagaman | Exploring Science, Engineering, and Art with Affordable Robotic Spheres | 3-8 |
| <u>12:00-1:00 pm</u> | <u>Mini Sessions</u> | Horrabin Hall Gymnasium |
| A. Sebastian Szyjka | STEM Related Activities | 5-8 |
| B. Abha Singh | How does structure and function work together? | 3-8 |
| C. Julie Bice & Mary McMahan | Saving the Magnificent Monarch | PreK-8 |
| D. LaVerne Logan, Jennifer Ashdown, Cynthia Peterson-Castro, & Voloria Noland | Technological Design - Catapults | 5-8 |
| E. Don Powers | Exploring STEM Through Aerodynamics | 4-8 |
| F. John Guidl & Sean Park | Demonstrating KidWind Wind Experiment Kits as a Tool for Learning about Electricity, Power, and Wind Turbine Technology | 3-8 |
| G. Matthew Hagaman & Sara Smith | Tech Chains: Innovations of Tomorrow through Technologies of Yesteryear | 3-8 |
| 1:00-1:45 | LUNCH & CONFERENCE | Horrabin Hall Gymnasium |
| 1:45-2:30 | ANNOUNCEMENTS & DOOR PRIZES | Horrabin Hall Gymnasium |

2019 PreK-8 Science Education Update Conference

Welcome to the 32nd Annual PreK-8 Science Education Update Conference. At 1:00 pm lunch will be held in the Horrabin Hall Gymnasium. Announcements and door prize drawing will follow lunch. The conference is scheduled to conclude by 2:30 pm.

❖ ❖ ❖ 8:30-9:25 Concurrent Session I ❖ ❖ ❖

- HH 43 Improve Your Use of the Five Innovations - NGSS** **5-8**
Bob Friedel *Carolina Biological Supply, Burlington, NC*
Experience the 5 Innovations firsthand using the Smithsonian's STC Middle School "Matter and its Interactions". Participants will focus on activities that spark curiosity about real-world phenomena and meaningful engineering challenges. The "Beads in a Bottle" phenomena will be explained and given to all participants. Handouts will reinforce all connections.
How this session aligns with NGSS.
This workshop comes from the Smithsonian science modules; Matter & Its Interactions. Smithsonian's STCMS puts real-world and experiential phenomena in students' hands every day. This program was created to address the NGSS Performance Expectations: PS1-1, PS1-2, PS1-3, PS1-4, PS1-5, PS1-6, MS-PS3-4, MS-ETS1-1, MS-ETS1-2 and MS-ETS1-3.
- HH 44 What a "Waterful" World** **preK-5**
Ronda McKee & Mendy Sowers *Agriculture in the Classroom, Macomb, IL*
Water is vital to life! We will explore the various aspects of water and how it relates to our everyday life, our environment and the food we produce. We will provide activities to explain and demonstrate the water cycle to younger students. A watershed model will be demonstrated and followed up with several hands on activities for the classroom. Water conservation will also be explored with activities to make the topic relevant to students, preschool through middle school. Materials provided by Ag in the Classroom will be distributed to participants along with suggested websites and other resources related to the topic.
How this session aligns with NGSS.
This session may relate to LS2 Ecosystems: Interactions, Energy, & Dynamics; and ESS2 Earth's Systems.
- HH 62 A Bright Idea: Using a Scientific Practice to Teach** **3-5**
Science Content in NGSS Science
John Zenchak, *Central College, Naperville, IL*
Juell Markowski, & *Grand Prairie Elementary School, Joliet, IL*
Karissa Dobson *Central Elementary School, Rochelle, IL*
The world of NGSS Science can be enhanced when a scientific practice is used to teach content. Repeating this format gives students multiple experiences with a scientific practice while they work with concepts prior to the scientific explanations. As a result, teachers teach more effectively and student learn more efficiently.
How this session aligns with NGSS.
This presentation uses one activity to meet an NGSS performance expectation while incorporating science and engineering practices, disciplinary core ideas, and crosscutting concepts. The activity can be adapted to more than one grade level. It lends itself particularly to ideas with the physical sciences and can be used to address standards under the Disciplinary Core Ideas of 2-PS1.B Chemical Reactions and 4-PS3.D Energy in Chemical Processes and Everyday Life.

HH 3 Saving the Symbol of Illinois...the Magnificent Monarch! preK-8
***Julie Ann Bice & Mary McMahon* *Author & Illustrator, Quincy, IL
National Parks Ranger, Macomb, IL***

A tiny insect that travels across 3 countries just to save its heritage and its existence... is claim to fame as the Illinois Insect... the Monarch! Join Julie, an author and illustrator, and Mary, a National Parks Ranger, who met as teachers...and who happen to love Monarchs. They will the story with costumes, props, and a little song and dance that will help you become endeared to Monarchs for life! Everyone will have a part in an active fun presentation.

How this session aligns with NGSS.

Before the Monarch becomes an Endangered Species humankind needs to prepare themselves by studying the lessons that animals are trying to teach us in this world. Through their struggle to survive, Monarchs are telling us the future. Human friends can do their part to help strengthen the population by planting milkweed, providing nectar rich butterfly gardens, and promoting pesticide free school gardens which include training children to care. If we CARE, the next generation of children will still see generations of precious Monarchs migration between 3 countries for centuries to come.

HH 42 Eat It Up...Animal Mouth Structures 3-5
Kathy Mainz* *Monmouth College, Monmouth, IL

Join us as we gather evidence to understand mouth features that enable animals to survive. We'll look at the mouth structures of various animals and construct replica structures, to build conceptual understanding of how animals have adapted to obtain food in their environment.

How this session aligns with NGSS.

This activity is aligned with: Performance Expectations: 4-LS1-1, Science and Engineering Practices - Construct and support an argument with evidence, data, or a model, Disciplinary Core Ideas - LS1A Plants and animals have both internal and external structures that serve various functions in growth, survival, behavior and reproduction, Crosscutting Concepts - A system is a group of related parts that make up a whole and can carry out functions it individual parents cannot.

HH 59 Materials and Programs from the Illinois Department of Natural Resources preK-8
to Support Science Teaching

Joe Bauer* *Illinois Department of Natural Resources, Springfield, IL

The Illinois Department of Natural Resources provides supplemental, Illinois-specific materials and programs to educators. Lessons, publications, grants, items for loan and professional development workshops are just some of the options available. Learn about our new *Illinois Pollinators* resources trunks and the *Biodiversity of Illinois* searchable Web page, too!

How this session aligns with NGSS.

Our resources help to deepen educators' content knowledge and improve student learning in Life Sciences related to LS1: From Molecules to Organisms: Structures and Processes; LS2: Ecosystems: Interactions, Energy & Dynamics; and LS4: Biological Evolution: Unit and Diversity. We also work with the Illinois Early Learning and Development Standards in Science. Specific NGSS performance expectations vary with the resource program.



HH 43 Explore How We Can Provide Freshwater to Those in Need **5-8**
with Smithsonian Science
Bob Friedel *Carolina Biological Supply, Burlington, NC*

Smithsonian Science for grades 3-5. Find out how this NGSS-based K-5 program takes the stress out of teaching Engineering Design!! Participants will discover and apply problem-solving engineering techniques. Problem: "How can we provide freshwater to those in need?" Handouts and materials will be provided to all participants.

How this session aligns with NGSS.

This workshop comes from the Smithsonian science modules; Matter & Its Interactions. This session will feature Performance Expectations 3-5-ETS1-1; 3-5 ETS1-2; 3-5 ETS 1-3; 5-ESS1-3; 5-ESS2-1; 5-ESS2-2; 5-ESS3-1.

HH 44 Wild About Weather **preK-3**
Stacy McQueen *Virginia Elementary School, Virginia, IL*

This session is full of hands on activities to guide students through several of NGSS performance expectations as they learn about weather. Participants will design and perform hands on activities/investigations as we explore snow, ice, wind, rain, and the Sun.

How this session aligns with NGSS.

Investigations will be presented that will engage learners through the engineering design process by using and developing their natural scientific skills through hands on activities. These activities align with NGSS expectations including the universe and its stars, weather and climate, conservation of energy and energy transfer, optimizing the design solution, structure and properties of matter and its interactions, motion and stability, and interdependent relationships in ecosystems.

HH 62 Exploring Science, Engineering, and Art with Affordable Robotic Spheres **3-8**
Matthew Hagaman *Bradley University, Peoria, IL*

Explore 24 ways to use robotic spheres to make fun, interactive art! Science, technology, engineering, and mathematics can combine to teach art concepts alongside 21st century skills in computer programming. Participants will get hands-on with robots and learn how to borrow a class set of robots at no cost!

How this session aligns with NGSS.

These activities are designed with engineering applications in mind, and as a result can address a number of NGSS-ETS standards at a variety of grade levels.

❖ ❖ ❖ **12:00-1:00 Mini Sessions** ❖ ❖ ❖
Horrabin Hall Gymnasium

- A. Stem Related Activities** **5-8**
Sebastian Szyjka *Western Illinois University, Macomb, IL*
 This mini session will include a sampling of several STEM related activities related to physical science for grades 5-8. Connections will be made to NGSS standards. Includes activities from NSTA sources.
- B. How does structure and function work together?** **3-8**
Abha Singh *Western Illinois University, Macomb, IL*
 Participants will use permitted tools to disassemble and assemble a toy. The scientific practices implemented will inform the application of structure and function of each part and how tools effectively function for applicability.
- C. "For the Love of the Monarch" book signing** **preK-8**
Julie Bice *John Woods Community College, Quincy, IL*
 Join the author and illustrator of "Power of the Flower" as she releases her newest publication "For the Love of the Monarch". Talk to the author and learn about her love for the Illinois State Insect - the Monarch Butterfly. Copies of her book will be available.
- D. Technological Design - Catapults** **5-8**
LaVerne Logan, Jennifer Ashdown,
Cynthia Peterson-Castro, & Voloria Noland *Western Illinois University, Moline, IL*
 This session will feature key elements of technological design. Students will face a series of challenges as they plan/design, build, test, and re-design catapults, using common, everyday materials. This activity targets middle to upper elementary students while focusing on Appendix J - (S-T-S) in the Next Generation Science Standards.
- E. Exploring STEM through Aerodynamics** **4-8**
Don Powers *Western Illinois University, Macomb, IL*
 Investigate different aerospace vehicles and see how you can integrate NGSS Scientific and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas using flying devices. Emphasis will be on DCI: Engineering, Technology, and Applications of Science,
- F. Demonstrating KidWind Wind Experiment Kits as a Tool for Learning** **3-8**
about Electricity, Power, and Wind Turbine Technology
John Guidl & Sean Park *Western Illinois University, Macomb, IL*
 The Illinois Institute for Rural Affairs is offering a lending program next school year. Science teachers may borrow a Vernier KidWind kit most appropriate to their class grade level **at no cost** for 1 to 2 months. During the session, we will demonstrate two kits that are available.
- G. Tech Chains: Innovations of Tomorrow through Technologies of Yesteryear** **3-8**
Matthew Hagaman & Sara Smith *Bradley University, Peoria, IL*
 How do you integrate engineering and technology standards into your teaching? We will explore an interactive resource for understanding existing chains of technologies - clocks, electromagnets, and elevators may be simpler than you think!

❖ ❖ ❖ **1:00-1:45 Lunch** ❖ ❖ ❖
Horrabin Hall Gymnasium

❖ ❖ ❖ **1:45-2:30 Awards, Recognition & Door Prizes** ❖ ❖ ❖
Horrabin Hall Gymnasium

Professional Development Hours

Illinois Science Teachers Association is a recognized professional development provider and the conference is registered with the Illinois State Board of Education to provide 4 Professional Development Hours toward certificate renewal. We will be providing each teacher participating in the conference today with two forms, the Evaluation Form, found in your conference folder, to be turned in to us, and the Evidence of Completion that you will take with you as evidence of completion of the Professional Development Hours. The Evidence form will be available when you turn in the Evaluation form at the conclusion of the conference, following the networking lunch, announcements and drawing for door prizes, in the Horrabin Hall Gym.

2019 PreK-8 Science Update Conference Exhibitors

*We offer our thanks to the commercial and agency exhibitors
for providing the many door prizes made available to the participants
attending the Thirty-second Annual PreK-8 Science Education Update Conference.*

Please be sure to visit their displays and express your appreciation.

Agency/Vendor on site

Amplify Science

Carolina Biological
2700 York Road, Burlington, NC 27215

Illinois Department of Natural Resources
One Natural Resources Way, Springfield, IL 62702

Illinois Petroleum Resource Board
PO Box 941, Mt. Vernon, IL 62864

Illinois Science Teachers Association

MicroTech Microscope Sales & Service
603 8th Avenue, Mendota, IL 61342

National Science Teachers Association
2974 N River Walk Drive, Chicago, IL 60618

Wards Science
1221 Suffolk St., Naperville, IL

Agency/Vendor not on site but contributing door prize

The Scope Shoppe
PO Box 8058, 113 Read St., Elburn, IL 60119

Representative

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Special Thanks to Dr. John Beaver,
Science Education Director, emeritus
for donation of SNAP Electrical Circuit Kit for door prize raffle.

❖ 2019 PreK-8 Science Education Update Conference Presenter Biographies ❖

Jennifer Ashdown is an undergraduate student studying Elementary Education at Western Illinois University. She is currently a junior and will be graduating in Spring of 2020. She is a student worker at the university and enjoys singing and playing guitar in her free time.

Joe Bauer began working at the Illinois Department of Natural Resources (IDNR) in August 2004 and in the Division of Education as an Education Specialist in June 2006. Joe previously worked in the private sector and also spent six years in the United States Navy. He is a former adjunct faculty member of Richland Community College in Decatur, Illinois.

Julie Ann Bice has a Bachelor of Science in Elementary Education from Quincy University and a Master Degree in Multidisciplinary Education from WIU. She is a career teacher, college instructor, and author and illustrator of “Power of the Flower” and “For the Love of the Monarch”. She is a recipient of the Maurice G. Kellogg Science Teacher of the Year award. She has led numerous workshops, seminars and assemblies about Monarch and Butterfly Gardening with Children.

Karissa Dobson teaches fourth grade at Central Elementary School (Rochelle). Her classroom include ELLs and students who are effected by low family income and poverty.

Bob Friedel is a lifetime science educator and has taught at the elementary, middle, and high school levels. He presently is consulting for The Smithsonian and Carolina Biological.

John Guidl has his Ph.D. in Economics and was a faculty member at Western Illinois University for 26 years. John has been involved with renewable energy for several years. He works with the KidWind Wind Experiment Kits, a free resource to study wind generated electricity and power, and wants to get these kits into the hands of practicing teachers.

Matthew Hagaman teaches Inquiry Education at Bradley University and develops STEM curriculum at Illinois State University. He holds a bachelor degree in Elementary Education as well as a master degree in Instructional Design & Technology and Art Education.

LaVerne Logan earned his Ph.D. from the University of Iowa. He is a professor and in his 19th year teaching undergraduate and graduate science and middle level education classes at Western Illinois University - Quad Cities campus. Prior to coming to Western Illinois LaVerne taught elementary, middle school, and high school science in the Iowa public school system.

Kathy Mainz has a BS in Elementary Education from WIU and done extensive graduate work in science education, gifted and talented education, geology, geography, and meteorology. She has taught middle school science in Iowa and Illinois for 14 years and served as State Science and Gifted consultant for the Iowa Department of Education for 4 years. Currently she is Laboratory Manager for the Department of Biology at Monmouth College and the Chemical Safety Director for Monmouth College. She has been the Director of College for Kids at Monmouth College for 11 years.

Ronda McKee has her BS and MS from Western Illinois University. Ronda retired from the West Prairie School District in 2012 where she taught PreK classes for 23 years. She has been a coordinator for the Ag in the Classroom program in McDonough County for 6 years.

Juell Markowski, an educator at Grand Prairie Elementary School (Joliet), teaches students in an Extended Day Kindergarten program. Her classroom includes students from diverse backgrounds that are considered at-risk in the area of literacy development. She has been awarded the Award of Excellence from Plainfield School District 202 (Spring 2019).

Mary McMahon has a BS in Special Education and MS in Parks and Recreation, both from WIU. She is currently a National Parks Ranger with the National Parks Service. She has worked in Glacier National Park, Montana in 2016, 2017, & 2018); Mammoth Cave, Kentucky (2015); and Missouri Recreation River (2014). She is currently commissioned to Glacier National Park for Summer 2019. She has led numerous seminars and workshops on bats and monarchs. She is a recipient of the Maurice G. Kellogg Science Teacher of the Year award.

Stacy McQueen is currently teaching K-5⁺ grade special education in Virginia, Illinois. Her favorite subject to teach is science. She holds degrees in both regular and special education. She has presented at the local and state level. She is a master naturalist and the 2018 Ag in the Classroom teacher of the year for Illinois.

Voloria Noland is an Elementary Education senior at Western Illinois University. She has worked as a tutor for over 5 years and currently tutors math through a program in Bettendorf. When she is not tutoring or in class, she acts as the Vice President for the Society of Educators at WIU. Voloria is passionate about expanding her knowledge of STEM education.

Sean Park is an economist with extensive experience in small business consulting. He has been involved with renewable energy for several years. He works with the KidWind Wind Experiment Kits, a free resource to study wind generated electricity and power, and wants to get these kits into the hands of practicing teachers.

Cynthia Peterson-Castro is an undergraduate student at Western Illinois University-Quad Cities Campus, studying elementary education. Currently she works as a bank teller and teaches Sunday School for preschoolers.

Don Powers has a B.A. in Science Teaching and a M.A. in Science Education from the University of Northern Iowa, and a Ph.D. from Kansas State University. Don is a professor of science education at WIU, currently in his 30th year on the faculty. He has presented at the national, regional, and local levels. Dr. Powers has co-authored several grant-funded projects in elementary science and currently serves as a Regional Director for the Illinois Science Olympiad and a Regional Director for Illinois Science Teachers Association. He also serves on the Archives Committee of the Illinois Science Teachers Association.

Abha Singh is completing her 11th year at Western Illinois University where she teaches science methods and supervises field experiences. She has her M.S. and Ph.D. from the University of Iowa in science education and environmental science and a minor in gifted education. Her current research focuses on reflective journaling by pre-service teachers.

Sara Smith teaches science and STEM in grades K-8. She has a B.S. in Elementary Education from Bradley University and is certified to teach English as a second language in grades K-9.

Mendy Sowers has her Associates Degree in Business. Mendy taught the K-5 library classes at Bushnell Prairie City for 7 years. She is currently an Ag in the Classroom Coordinator in McDonough County.

Sebastian Szyjka is completing his 9th year as a member of the Science Education Center. Dr. Szyjka earned his BA and M.A. from WIU and his Ph.D. in Curriculum and Instruction from Southern Illinois University, Carbondale. He has presented at state and national conferences and has had a number of articles published in reviewed publications as well as written and directed various grants.

John Zenchak, a professor at North Central College (Naperville), works with K-8 preservice teachers at the college, and K-8 inservice teachers in high-needs schools. His methodology has been described at national, regional, and local conferences, in NSTA's Science and Children, and tested in K-8 classrooms in the Chicago area.

*Stay informed about the upcoming
science events in Illinois &
the implementation of NGSS in the State of Illinois
by joining the
Illinois Science Teachers Association
<https://ilscience.org/membership>*

Joining ISTA will also help provide evidence for:

- Enhancement of Content Knowledge and Pedagogical Skill
- Collaboration and Professional Inquiry to Advance Student Learning
- Participation in School Leadership Team

Attend and present at the

**2019 Illinois Science Teachers Association/
Illinois Council of Teachers of Mathematics
Annual Joint Conference**

Theme: Expanding, Inspiring, and Motivating

October 18-19, 2019

Peoria Civic Center

Peoria, Illinois

<https://ilscience.org/>

WIU Science Education Center Faculty & Staff

Dr. LaVerne Logan, Professor, on-site coordination
Dr. Donald T. Powers, Professor, conference coordinator
Dr. Abha Singh, Associate Professor, registration, on-site coordination
Dr. Sebastian Szyjka, Associate Professor, on-site coordination
Ms. Olajumoke Babatunde, Graduate Assistant, on-site coordination

We express our thanks to Western Illinois University, the College of Education and Human Services and the Department of Curriculum & Instruction for their support in making the conference possible.

Dr. Jack Thomas, WIU President
Dr. Katrina Daytner, Interim Dean, College of Education & Human Services
Dr. Greg Montalvo, Assistant Dean of Educator Preparation, College of Education & Human Services,
Dr. Laura Frey, Chair, Department of Curriculum & Instruction,

Maurice G. Kellogg Award for Excellence in Science Teaching Recipients

| | | | |
|-------------|---------------------------|-------------|-----------------------|
| 2003 | Elizabeth Burton | 2008 | Tracy Trimpe |
| 2004 | Carol Van De Walle | 2009 | Mary McMahon |
| 2005 | Greg Van Vleet | 2010 | Judy Witten |
| 2006 | Steve Hoffman | 2011 | Julie Ann Bice |
| 2007 | Kent Buckrop | 2012 | Lisa Maxwell |
| | 2014 | | Maria Montalvo |

The PreK-8 Science Update Conference is supported by the
Maurice G. Kellogg Science Education Center Fund,
Kellogg Science Education Endowment Fund,
College of Education and Human Services,
Department of Curriculum & Instruction, and
Illinois Science Teachers Association

**THANK YOU
FOR ATTENDING THE
2019 WIU PreK-8 SCIENCE UPDATE CONFERENCE**

Notes