Welcome to the 2022 issue of Science Education News! UNI Science Education is an interdepartmental group of faculty in different departments in the Colleges of Humanities, Arts, and Sciences (CHAS) and College of Education (COE). Science Education offers both undergraduate and graduate programs and related courses. Our Science Education program also provides important resources and outreach for faculty, students and in-service teachers.

For the 2022-2023 academic year, we are very excited to return to a more “normal” environment that is as enjoyable and stress-free which existed before the COVID pandemic. Although declining enrollment is an issue UNI and universities in general face, the good news is that through intensive recruitment efforts, UNI’s first-year enrollment has increased. The university as well as all colleges and departments including Science Education are doing everything we can to ensure that this trend continues.

At the university level, a number of initiatives are taking place including academic positioning that begins with an assessment of the academic structure of the university and then changes the structure to position the university for growth. The transformation of the teacher preparation program is also being focused on with a thorough review of the length and content of UNI teaching programs so that students can complete their programs in a timely manner but still maintaining the high quality for which UNI is known. UNI has also undertaken a redesign of the General Education program. The new program, called UNIFI (UNI Foundational Inquiry) has been offered for the first time this Fall 2022 and replaces the existing Liberal Arts Core. All new students will complete the UNIFI and the majority of existing students have transitioned over since it is 8 credits shorter.

At the department level, we are initiating and participating in a number of initiatives that will help with recruitment and retention of students as well as with our mission to provide outreach to schools, teachers, and students across Iowa. We also hope to establish a new “Science Education Fund for Excellence” that will help us provide funding for enrichment opportunities for our students that state dollars just won’t cover.

I want to close by thanking those of you who have provided generous support for our students and programs. Your contributions allow us to offer scholarships, resources, and support to our students and teachers/schools that we serve. It is very rewarding and gratifying for me to serve as Director of Science Education. Thanks to the generous funding of Dr. Robert and Brenda Good, we will be hosting the UNI Science Education Update Conference for future and existing science teachers on March 31, 2023 here on the UNI campus. See link found in the later section and mark your calendar. I hope to see you there!

Let us know what’s new with you by contacting us at https://chas.uni.edu/science-ed/contact-us.

Best wishes,
Lawrence Escalada
Would you like to help our Science Education program provide an additional margin of excellence that will enrich the UNI experience of our students and help them be even more career-ready upon graduation?

We would like to set up a Science Education Fund for Excellence.

This fund is an unrestricted fund that directs resources to opportunities where funds might otherwise be limited. State funds continue to decrease, and most have restrictions on how they can be used.

A Fund for Excellence would give us the ability to provide critical resources for opportunities that can make the difference between ordinary and extraordinary - such as undergraduate research, modest equipment and supplies purchases, student/faculty conference participation and professional development.

We have an initial goal of $1000 to launch our fund. To find out how you can help get our initiative off the ground, contact UNI Science Education Director Dr. Larry Escalada (319-273-7357 or lawrence.escalada@uni.edu) or Senior Development Director Cassie Benning Luze (319-273-6360 or cassie.luze@uni.edu)
We are very happy to have Jesse join our faculty.

About UNI so far has been the people. I’ve really gotten to know people. I think my favorite thing is that we have tons of opportunities, but small enough you can get to know people. I think my favorite thing about UNI so far has been the people. I’ve really enjoyed getting to know and work with such talented students and faculty on this campus.” We are very happy to have Jesse join our faculty.

Jesse Wilcox, Assistant Professor of Biology and Science Education

Jesse Wilcox is a new addition to Biology and Science Education beginning in Fall 2021. Jesse completed his BS in Biology, MAT in Science Education, and Ph.D. in Science Education at Iowa State University. Prior to coming to UNI, he was most recently an Assistant Professor at Simpson College. He started his teaching career at Valley Southwoods in West Des Moines teaching high school biology and general science. At UNI, Jesse teaches biology and science education courses including Methods for Teaching Secondary Science, Inquiry into Life Science, Organismal Diversity Lab, and Research in Biology. He supervises undergraduate and graduate students in research. His research includes the natures of STEM, self-efficacy in science teaching, science teacher attrition and retention, undergraduate research experiences, and investigating how best to prepare and support science teachers using research-based practices. He also serves as one of the biology teaching major advisors. When asked about his thoughts about UNI, he said, “I think UNI is just such a great size. It’s big enough that we have tons of opportunities, but small enough you get to know people. I think my favorite thing about UNI so far has been the people. I’ve really enjoyed getting to know and work with such talented students and faculty on this campus.” We are very happy to have Jesse join our faculty.

Jody Stone, Professor of Teaching and Science Education

Retirement: Jody Stone

Jody Stone, Professor of Science Education and Teaching, retired in June 2022 with 43 years of service which included teaching high school chemistry and middle school science at the UNI Price Laboratory School/Northern University High School. Jody taught graduate courses for Science Education and supervised graduate research for students in the MA Science Education program. She supervised Level 1 Field Experiences for the Department of Teaching and taught science elementary methods courses for the Department of Curriculum & Instruction in the College of Education. Jody, a prolific researcher, received over $1 million in grants to support her work in developing science curricula and providing professional development for science teachers. She was an esteemed colleague who was quite active in teaching, scholarship, and service. She was an excellent teacher and advisor who was regularly sought out by future advisor who was regularly sought out by future and existing teachers as well as her colleagues. We wish Jody the best and will miss her immensely.

Updated UNI Science Education Website

The UNI Science Education website has a new location and has been updated. Check it out at the following link - https://chas.uni.edu/science-ed.

We hope that you will find the necessary information and that the website is easy to navigate. Feel free to provide us feedback on your thoughts about the new website.

Basic Science Minor

Science Education plans to make revisions to the Basic Science Minor to make it more accessible for early childhood, elementary, and middle level teaching majors so they can complete the program in a timely manner. The minor will align with the state requirements for the Basic Science K-8 endorsement which includes 12 hours in physical sciences, 6 hours in biology, and 6 hours in earth & space sciences for a total of 24 hours.

Students would be required to complete the SCI ED 1100, 1200, and 1300 Inquiry courses offered for elementary teaching majors but would be able to count college science courses they may have taken previously for the minor.

Purple Pathway Paraeducators

UNI is offering a new online, accelerated pathway to a bachelor’s elementary education degree is specifically designed for paraeducators with associate’s degrees who can draw on their experience in the classroom while working toward a four-year degree. UNI would partner with the Waterloo school district which builds on the Teach Waterloo initiative with funding from McElroy Trust, Waterloo Schools Foundation, and John Deere Waterloo Operations as well as school districts who are recipients of Iowa Department of Education Teacher and Paraeducator Registered Apprenticeship Pilot Grant Program. Paraeducators would be able to earn their teaching degree in two years and, upon successful completion of student teaching would be eligible for licensure in Iowa for two endorsements including the elementary K-6 and strategist I - the special education endorsement for working with students with mild to moderate special needs. Participants in the program would meet minimum state requirements in science by completing one or two science courses prior to beginning the program and an integrated science content course focused on physical science with some life and earth & space sciences along with an elementary science methods course and math content course during Terms 5 & 6 or summer semester of the program. Dana Atwood-Blaine, Alison Beharka, Catherine Miller, Mason Kuhn, and Larry Escalada have been involved in helping with planning for Terms 5 & 6 of the program. Program begins Fall 2022.
The UNI Science Update Conference was a one-day conference for current and future teachers held on April 1, 2022 at the UNI campus for the first time in 3 years. The conference focused on issues and topics related to Grades K-12 science and STEM, featuring breakout and workshop sessions, networking focus groups, exhibits and access to instructional resources and strategies that can be implemented in the classrooms. Dean John Fritch and Provost Jose Herrera provided their welcomes. Dr. Robert Good, UNI alumnus and Medical Director of Medical Management of Carle Health System and Professor of Medicine at University of Illinois Carle Illinois College of Medicine provided the keynote. The conference was funded by the generous support of Dr. Robert and Brenda Good. Sessions, exhibits, and focus groups were presented, shared, and facilitated by science teachers, UNI faculty, Iowa PBS, Iowa Department of Natural Resources, Jacobson Institute at the University of Iowa, Teacher Institute for Evolutionary Science & ScienceSaves, Northeast Iowa Regional STEM Hub, MicroTech Microscope Sales & Service, UNI STEM Support Services, UNI Science Education, and UNI Departments of Physics & Computer Science. Close to 100 people were in attendance. Participating teachers were provided substitute teacher reimbursements so they could attend.

UNI Student Chapter of the National Science Teachers Association

UNI has a long history of having students be involved in the National Science Teaching Association (NSTA) by being a student member, attending national and/or regional meetings, and presenting talks and/or posters at meetings. In 1976, UNI was the fifth institution in the nation to be given a charter as a Student Chapter of the NSTA. In 1984, the UNI Student Chapter was recognized by the Northern Iowa Student Government. Unfortunately the UNI Student Chapter has been inactive for about 10 years. We are excited to announce that we have begun the process with both Northern Iowa Student Government (NISG) and NSTA to restart the UNI Student Chapter of the NSTA to help with student recruitment and retention as well as provide our students with the necessary experiences and resources to be successful science teachers. We had our first meeting on September 1, 2022 with a visit to the UNI Botanical Center in which students engaged in a plant propagation activity. Participants received their own plants to grow. Pizza and treats followed with a meeting to discuss future plans for the science teaching club. The second meeting was held on September 15, 2022 at the Iowa Regents’ Center for Early Development Education in Room 117 Schindler Education Center. Instructional materials and equipment that may be used with light for Shadow Play and Color Mixing activities for the Halloween House were reviewed. Students participated in Sunday at the Quarry at BMC’s Raymond Quarry, participated in the UNI Homecoming Parade, and helped with Halloween House hosted by the UNI Student Associates of the American Chemical Society (SAACS) in October. Officers have been elected including Catherine Lindley (President), Margarette Fakler (Vice President), Greta Birch (Treasurer), Madisyn Urban (Secretary), and Lily Fettkether (Publicity Coordinator). Jesse Wilcox is the faculty advisor for the club.

UNI Science Education Update Conference participants making note of observations during a workshop session.

See link - https://scholarworks.uni.edu/sciedconf_documents/ for the program and presentations given at the conference. With continued support from Dr. Robert and Brenda Good, our next UNI Science Education Update Conference is scheduled for March 31, 2023.

MA Science Education

Information about the MA Science Education program may be found at chas.uni.edu/science-ed/graduate-students/science-education-ma-information.

A new MA Science Education cohort began in Summer 2022 with a new student orientation held in Spring 2022. Lyn Countryman taught SCI ED History, Philosophy, and Nature of Science course in Summer 2022 and Jeff Morgan is teaching SCI ED 6800 T eaching Learning Models course in Fall 2022. Jesse Wilcox will be teaching SCI ED 6900 T trends and Issues in Science Education in Spring 2023. All these graduate courses are core courses required for the program and taught online.

Yager Science Education Resources & Outreach (Formerly known as UNI Science Education Resource Center)

Dr. Alison Beharka, Instructor & Yager Science Education Resources & Outreach Supervisor.

Name Change and Funding

The UNI Science Education Resource Center (SERC) will continue its mission under a new name: Yager Science Education Resources and Outreach. Dr. Robert Yager graduated from UNI (then the Iowa State Teacher's College) in 1950, subsequently earning his master's and doctorate degrees at the University of Iowa. Over the course of his 50-year career, Dr. Yager became one of the country's most distinguished and visionary science education professors.

Prior to his death in 2019, Dr. Yager had supported UNI with gifts totaling more than $130,000. In recognition of Dr. Yager's past generosity and the Yager family's continued commitment to UNI Science Education, the university has renamed the center in his memory.

In 2022, the Yager family awarded UNI a generous gift of $100,000 to provide materials and programmatic support for the on-campus science education resource center – located in McCollum Science Hall.

Thanks to the generous support of the Yager family, UNI Science Education will be able to provide the latest high-quality instructional materials and support professional development for future and existing science teachers to effectively engage their students in science.

The Yager Science Education Resources and Outreach will continue to provide highly sought-after curricular tools and support for UNI students/faculty and science teachers/schools within Central Rivers Area Educational Agency (AEA) with whom we have a collaborative agreement to provide resources with delivery provided by the AEA.

Reservations 2022-2023

Yager Science Education Resources and Outreach (YSERO) is coordinated by UNI Science Education Faculty and Staff and operated by students including those who will be future science teachers. YSERO provides curriculum resources and outreach for not only UNI students and faculty but also to teachers and students in schools within the Central Rivers Area Education Agency (AEA). Resources including Grades K-8 Next Gen FOSS Science Kits are available for checkout during the 2022-2023 academic year. See https://chas.uni.edu/science-ed/serc for details including resources available as well as reservation and contact information.

OpenSciEd

Yager Science Education Resources and Outreach will be supporting the implementation of OpenSciEd - high-quality instructional materials in science classrooms and introducing the resources in science methods courses. OpenSciEd provides high quality, open-source, full-course science instructional materials designed and aligned to the Framework and Next Generation Science Standards and support for implementation in the classroom. The instructional model uses a storyline approach - a logical sequence of lessons that are motivated by students’ questions that arise from students’ interactions with phenomena. Middle School Science instructional units are currently available with high school and elementary to follow later. Each instructional unit undergoes external reviews, field tests, and revisions. See https://www.openscied.org/about/ for information about OpenSciEd. Alison Beharka and Larry Escalada have completed facilitator training for two of the middle school science units - 6.1 Light & Matter and 8.1 Contact Forces. They are currently working on completing OpenSciEd microcredentials to facilitate training with both existing and future science teachers. Mini-workshops are being planned for the 2022-2023 academic year.
New Next Gen FOSS Science Kits Ready for checkout!

**Forces in Action - 1st - 2nd Grade**
Students engage with the phenomena of forces—contact forces that make objects start to move or change their motion, and force at a distance—gravity and magnetism. They investigate moving objects, and then apply their understanding to design ways to control or change the motion of those objects.

Throughout the **Forces in Action Module**, students engage in science and engineering practices to collect and interpret data to answer science questions, make predictions, construct explanations, and define problems in order to compare solutions and communicate findings. Students gain experiences that will contribute to understanding of crosscutting concepts of patterns; cause and effect; scale, proportion, and systems models.

**Sound Design - 3rd - 5th Grade**
The Sound Design Module has three investigations that engage students with the phenomena of sound and the ways that humans and other animals use it in their lives. The driving question is what is sound and how can we produce and design sound?

Through firsthand experiences students ask questions, plan and carry out investigations, interpret data, and construct explanations about how sound is produced by vibrating objects. Students have experiences with sound pitch, sound volume, and instruments that produce musical sounds. They also engage in the engineering design process by designing and building musical instruments. Students gain experiences that will contribute to the understanding of the crosscutting concepts of patterns; cause and effect; systems and system models; and energy and matter.

**Observing Nature - Pre-Kindergarten**
These investigations use local trees through the seasons to provide pre-K students with age-appropriate experiences with life, earth, and physical science. These experiences will serve them well as they investigate these concepts in more sophisticated ways when they are in kindergarten.

Throughout this module students engage in science and engineering practices by asking questions, participating in collaborative investigations, observing, recording, and interpreting data to build explanations, and obtaining information from photographs. They have opportunities to draw and label their observations, and to share their ideas verbally with their peers and adults. Students gain experiences that expose them to the crosscutting concepts of patterns, cause and effect, and structure and function.

**Weather & Seasons - 2nd Grade**
Students engage with the phenomenon of the air that surrounds us and the earth materials that cover the planet’s surface. They use tools and methods to build on their understanding of the weather. They use calendars to record observations and monitor change over a day, weeks, and months. Students use simple tools to observe, describe, analyze, and sort solid earth materials. They observe the properties of rocks of various sizes and study the results of weathering and erosion, and locate natural sources of water.

Students explore how wind and water change the shape of the land and compare ways to slow the process of erosion. Students learn about how the weather changes through the seasons and how those changes impact living things.

Throughout the **Weather and Seasons Module**, students engage in science and engineering practices to collect and interpret data to answer science questions, develop models to communicate interactions and processes, and define problems in order to compare solutions. Students gain experiences that will contribute to understanding of crosscutting concepts of patterns; cause and effect; scale, proportion, and quantity; energy and matter; and stability and change.

**FOSSWeb Transitions Over to ThinkLink Beginning in Summer 2022**

FOSSweb.com - an online resource for Next Gen FOSS Science Kits is no longer available and has transitioned over to ThinkLink. See [https://thinklink.schoolspecialty.com](https://thinklink.schoolspecialty.com) to access. When checking out a Next Gen FOSS Science kit from Yager Science Education Resources and Outreach, you will be provided access to the ThinkLink online resources.
Cassidy Leadley

Cassidy Leadley is a junior majoring in Comprehensive Secondary Science Education and minoring in French. She is from Waterloo, Iowa. On campus, she is a part of Cat Crew to welcome new students at the beginning of the year and a part of the Yarn Club. Cassidy also works as a CNA at Western Home Communities and as a private tutor for high school students. It is her first semester working at the YSER0, and she is excited to learn about all of the resources available to science teachers! Cassidy aspires to teach dual immersion French and English science in a middle school in her hometown, and will be doing her student teaching in the Fall of 2025.

Ashlynn Samsel

Ashlynn Samsel is a Senior majoring in Middle Level Education with focus on Science and Social Studies. She is from Cherokee, Iowa. This is her third year working in the YSER0, and she is excited to continue learning about resources that could be used in her future teaching career. Ashlynn aspires to teach middle school science around her hometown in Northwest Iowa. Ashlynn will be student teaching in the Spring of 2023.

Catherine Lindley (Caitie)

Catherine Lindley (Caitie) is a senior majoring in Comprehensive Secondary Science Education major from Dubuque, IA. This is her fourth year working in the YSER0. She is a first year college student, who is also a part of Jump Start as a Pathfinder. Catherine is also on the university’s ultimate frisbee women’s team as their co-secretary, and a multicultural hip hop dance team on campus called The MOVEment.

This year she looks forward to focusing on her balance of professionalism and creativity. As she is going into her level 3’s she wants to become more prepared for what teaching life throws at her. Her future plans are to finish her level 4’s (student teaching) in the spring of 2024. She aspires to teach high school science at the same high school Catherine graduated from.

Larry Escalada joined Jason Martin-Hiner, Keystone AEA Science Consultant & School Improvement Specialist, and Amy Johannsen, HS Instructional Coach for Southeast Polk High School, in representing Iowa to participate in the Building Capacity in State Science Education (BCSSE): Leveraging Freely Available Open Education Resources in Transforming Science Education Conference on June 29 - July 1, 2022 in Minneapolis, MN. The conference was designed to help state science leaders leverage free, high-quality instructional materials and related resources (e.g. OpenSciEd) to advance science education. State teams were able to experience contemporary science instruction, hear from experts in the field, share learning across states, and have dedicated collaboration time to reflect and strategize on the use of high-quality Open Education Resources (OER) to improve science learning.

Iowa Team developed initial goals that High Quality Instructional Materials (HQIM) and related professional development should be used to help prepare and support future and existing science teachers. The UNI Science Education Update Conference could be used as a forum to continue discussion. See link - https://sites.google.com/cosss.org/2022bcsseoer for details on the conference.
I/we would like to support the following fund(s).

$ _______ Cherin Lee Endowed Science Education Graduate Scholarship (213703-30) for students who are currently employed K-12 educators who are fully admitted in the MA Science Education program.

$ _______ Dr. David V. McCalley Endowed Science Education Scholarship (212759-30) for currently employed K-12 educators who are fully admitted in MA Science Education program or students who have a previous degree in a related science field and who are fully admitted students seeking a second bachelor’s degree in any secondary science teaching major.

$ _______ Myrna and Gary Floyd Endowed Scholarship (212166-30) for comprehensive secondary science, middle level science, and biology teaching majors (Based on Merit & Financial Aid, Preference to seniors).

$ _______ Streitberger/Mohr Endowed Scholarship (212773-30) for Science Education students (Merit, Sophomore or Junior, Financial Need, Iowa resident).

$ _______ Albert A. Potter Endowed Scholarship (211286-30) Must be enrolled in and completed a minimum of 65 hours as well as admitted to Teacher Education (Based on GPA, Financial Need, and promise of secondary science teaching)

$ _______ Grace Ohrtman Endowed Scholarship (211898-30) for Science Education majors. (Based on Financial Need and must teach in Iowa for 3 years)

$ _______ Warren Bromann Endowed Scholarship (213198-30) for Science Education majors with preference to Comprehensive Secondary Science and Middle Level Science Teaching majors. (Based on Financial Need and must be a junior).

$ _______ James and Cynthia Kenyon Endowed Scholarship (211059-30) Preference given to Science Education majors and Graduates of Cedar Falls High School.

$ _______ Maria Koster Jarr and Klaus Jarr Endowed Family Scholarship (213564-30) for Science Education, Math Education, and Technology Education. Must be a Native Iowan.

$ _______ Dr. Robert E. Yager Science Education Resources Fund (223915-21) which provides professional development and resources for future and existing science teachers.

$ _______ Science Education Update Symposium (222503-21) one day conference held each spring for future and existing science teachers.

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