

2019 Iowa STEM Teacher Externships

Externship Descriptions and Quotes



Cindy Althoff

Jackson County Conservation

Maquoketa, IA



Cindy helped educate students and the community about nature, wildlife, and being respectful of both at Hurstville Interpretive Center in Maquoketa, Iowa. This involved helping lead summer school groups through the Maquoketa Caves, Prairie Creek Recreation Center, Eden Valley, and in the marsh at the Interpretive Center. She also helped maintain conditions at the Center by weeding, mowing, feeding animals (swans, turtles, frogs and a salamander), cleaning algae from the pond, loading and washing canoes and kayaks, explaining exhibits in the Center and allowing visitors to interact with the education turtles and snakes.



“In my classroom, I am going to be more conscious of using 21st century skills. I think it is important to not only have students use these skills, but also explain to them that it is not just another school only requirement. These are things they need to be able to do when they either go to college, a trade school or into the workforce.”

--Cindy Althoff, science teacher at Maquoketa High School

Doug Blosch

Mississippi River Museum and Aquarium

Dubuque, IA



Doug Blosch has been working with the National Mississippi River Museum and Aquariums (NMRMA) this summer through the Iowa Stem Externship program. The NMRMA's mission states their purpose is to: ““Our mission is to inspire stewardship by creating educational experiences where history and rivers come alive.”” Doug’s work will employ his knowledge of science education to create an educational unit used in his classroom and at the museum.



“This externship has opened my eyes to the reasoning behind Project-Based Learning as a tool that will not only engage students more deeply into the content but also open the door to a multitude of cross-cutting concepts and science and engineering practices naturally.”

--Doug Blosch, science teacher at Dubuque Hempstead High School

Joseph Bormann

John Deere Dubuque Works

Dubuque, IA



Joe was focused on continuous improvement (C.I.) at John Deere's Construction and Forestry Division in Dubuque. Employees submit "tags" on a large magnetic board when they need assistance with an issue or have an idea that adds value to their department. Issues range from work safety, supply management, quality manufacturing engineering, design, and maintenance. Ultimately the goal of the C.I. program is to maintain a competitive advantage while using its people to make decisions to improve day to day operations. Joe's externship includes delving into these issues to come up with solutions. Some solutions he engineered, some require him to inform others to make actionable steps in solving these issues.



“My daily life in a school setting and in the John Deere plant is similar. I have a space that I occupy, I have objectives and a team goal that I focus on. At the end of the day, in both settings, we are developing a product. A product in which we want to excel beyond expectations set outside of our facilities.”

--Joseph Bormann, technology teacher at Dubuque Alternative Learning Center

Jennifer Buckwalter

Jones County Conservation Center Junction, IA



Jennifer's duties during her externship included being at all the programs and events the Nature Center sponsors, and taking pictures as well as recording and gathering information. After the programs and/or events are done, she was responsible for using her photos and info to create promotional videos for each program they host. The Nature Center wants to get the word out about all the programs and events they have using social media and YouTube. She was also responsible to show another person how to create the videos and upload them so the project can continue.



“I see how organized all the workers are at the Nature Center- they have great employability skills. I will talk to my students during the school year regarding these skills and share examples I have come across during this externship.”

--Jennifer Buckwalter, business teacher at Maquoketa High School

Lara Earnest

Hartman Reserve

Waterloo, IA

Lara participated in various day camps, such as Oregon Trail, Hunger Games, Wild Kratts, Wacky Water and more. Camp activities ranged from hiking, picking berries, tie-dying, building campfires, archery, etc. Lara planned science activities with the naturalists and interns on-site. She made paper turtles, tie-dyed cloth, planted trees, cleaned ponds, read stories to children. Visitors at the center learned about animal and plant structures and camouflage. There were Sunday speakers once a month on nature topics and Paddle in the Park evenings to try out canoes and kayaks on the lake.



“I am so amazed at the many tasks and responsibilities of the 2 naturalists. They oversee the programs and camps but also the landscape at Hartman. Lots of education is involved. The conservationists do more for the care and sustainability of the living things in the environment and they love their work! I am still learning something new each day!”

--Lara Earnest, teacher at Lou Henry Elementary School in Waterloo

Carrie Even

Iowa DNR Sweet Marsh

Tripoli, IA



Sweet Marsh is an area that is used for public waterfowl hunting and fishing. Through her work with the Iowa DNR, Carrie has learned about wildlife in and around the marsh environment. Even has helped establish food plots for wildlife, banding of various birds, and helped with maintaining different water levels in the marsh environment. Also, Carrie plans to work with students to problem solve ways to help organisms that are endangered in Iowa. She is excited for students to show interest in finding ways to help these organisms and putting ideas to work in the environment near our school.



“This placement has been so valuable to me as a life science teacher. I have learned so much about how we control water levels in the marsh throughout the year. It was also eye-opening to me to learn that the Iowa DNR puts in food plots for the wildlife to have food and areas to find cover. Learning about farming has been fun and I have done things I never thought I could, like hooking up a trailer on a pickup and driving it, if needed. I truly have enjoyed my summer and thank the REAP-CEP program.”

--Carrie Even, science teacher at Denver Middle School

Caleb Ferring

Trinity Fabrication

New Albin, IA



Caleb partnered with Trinity Fabrication to enhance his skills and understanding of the welding industry. Some of the projects Caleb saw go through the shop included steel structures for ag facilities, gas stations, and power plants to name a few. Caleb completed and passed a weld test for an AWS welding certification for GMAW (commonly known as wire welding) in the flat position for unlimited thickness. Caleb plans to incorporate these industry standards into the Welding Career Pathway Certificate classes he will start teaching for Northeast Iowa Community College.



“At Trinity Fabricators, every weld is inspected to pass structural code and I am starting to get a much better understanding of what does and does not meet the code. This type of understanding will directly impact the way I teach both my welding and engineering classes. Also equally important... I have learned how to repair unacceptable welds to meet the code. Moral of the story to bring back to my students is "do it until you get it right!"

--Caleb Ferring, industrial technology teacher at Waukon High School

Megan Hamm

Allen Hospital

Waterloo, IA



UnityPoint Health
Allen Hospital

Denver High School science teacher Megan Hamm was at Allen Hospital shadowing and problem solving with professionals in various departments. Each department gave her a tour, had her shadow two individuals, and had the opportunity to interview professionals from all departments. She learned about many careers within Unity Point and now can better help to prepare her students to potentially work in one of these career paths.



“I am learning a lot of things to be able to help my students with my advanced science class along with my general science classes. There are some careers I did not even think about that I can now use in my class. Most of the time my students think of the medical field as RN, PT, or family physicians, but there are many other career paths in the medical field. What surprised me is that there are some people in this field (different lab aspects, hospital directories, etc) that did not go to college directly for this. They are getting training on the job, and they absolutely love their job.”

--Megan Hamm, science teacher at Denver Community Schools

Deborah Hanson

Hartman Reserve

Cedar Falls, IA



The Hartman Reserve is 350 acres of woodland located in the heart of Cedar Falls. Deb is working with their Naturalists by assisting with summer camps and activities. Hartman has a variety of outdoor education experiences such as: identification of native plants, local animal habitats, fishing, kayaking, hiking, survival skills, and more. Deb is excited to bring this nature experience back to her classroom.



“Working with the naturalists, I realize the importance of getting kids outdoors and learning from nature. Our highly technological world is a double-edged sword. It is imperative to teach a balance.”

--Deb Hanson, elementary teacher at Janesville Schools

Kelsy Knebel

Iowa DNR-George Wyth

Waterloo, IA



Kelsy spent six weeks learning about what it is like to work in a state park. She helped facilitate programming within the park through day camps and other educational outreach opportunities, worked to update some of the kiosk displays within the park, and assisted park staff in finalizing the interpretive plan for George Wyth. Kelsy was able to observe that the naturalists maintain the park, but they also work to build connections with the surrounding communities, support experiential learning for kids through various programs and day camps, and work to educate the public about Iowa's natural resources.



“My biggest takeaway is that my preconception of what someone who works for the DNR does was only a small fraction of the work they actually do. With each role/job title comes much more by way of outreach and education, managing and maintaining facilities, forging new partnerships, etc. In other words, there is more that goes on behind the scenes that one might initially think.”

--Kelsy Knebel, life science teacher at Hoover Middle School in Waterloo

Hannah Koerperich

Dubuque Metro. Area Solid Waste

Dubuque, IA



Hannah worked with the education, outreach and communication coordinator for the Agency this summer. Her main jobs were to create lesson plans for current outreach content, evaluate the use and effectiveness of the DMASWA education services tab on the Agency's website, and to come up with solutions to better serve local teachers while aligning to state standards and the Agency's mission. She also took on additional tasks with Dubuque County Conservation monitoring blue birds and other opportunities as they presented themselves.



“The ability to encounter a challenge or a misstep in your plan and move forward is a VERY important work skill. I think that by incorporating challenges into your curriculum and using problem/ project-based learning in your classroom is the perfect opportunity to practice and answer ‘what do I do now?’ The hardest part is for the teacher to sit back and let students struggle, we have the want to help students be successful when it might take some ‘fails’ to learn.”

--Hannah Koerperich, science teacher at Western Dubuque High School

Nathan Lahr

Collins Aerospace

Manchester, IA



Nate's main project involved analyzing how a department operates and to look for a better flow of the work to increase productivity. He worked primarily with two teams. Each of these teams have three stations and each station can handle most of the work that comes to the team, but there is certain work that can only be done on one of the stations and other work that can only be done on another of the stations. His goal was to put together a plan that allows for the work to flow more efficiently through this department with the equipment and operators that are available.



“While completing my externships it has become evident to me that employers are not highly focused on the content someone knows, but more on their ability to learn new things and adapt. If we are able to instill that love for learning and provide students with strategies and support to become a self-assessing capable person who knows how to constantly improve and what to do when they are stuck, it will be so valuable to them when they are ready to step into the job force.”

--Nathan Lahr, math and engineering teacher at West Delaware High School in Manchester

Katelyn Luensmann

Iowa DNR George Wyth State Park

Waterloo, IA

Kate was involved in summer camps that focused on acquainting and educating area youth with nature and wildlife in the park. She also helped write a plan for George Wyth that will be used to promote and facilitate programming for the park for years to come. A big highlight of her summer was her involvement with Outdoor Journey for Girls, a three-day, two-night camp designed to empower young women with the knowledge and skills for outdoor experiences. This externship has opened up communications between her classroom and many different organizations and provided partnerships that she can utilize to strengthen her instruction.



“A surprising part of the experience is watching how closely the park staff work together; they are like a family. They support and cheer for each other, challenge and grow from each other. It has truly been a pleasure being a part of this team and I look forward to continue to work with them in the future.”

--Katelyn Luensmann, science teacher at West High School in Waterloo

Dave Millis

Iowa DNR

Manchester, IA



Dave worked with the Manchester Fish Hatchery to monitor the use of one of the stocked wildlife areas on the Little Turkey River near Colesburg. The process involved surveying anglers using the stream to find out where they live, and how satisfied they are with size and number of fish they caught, and with their overall fishing experience. The survey also involved recording the species, number and size of the trout harvested or released. This project will help guide DNR site management decisions in the future and currently determines how many trout are stocked in each location supplied by the Manchester hatchery.



“This experience will help me better inform students interested in a career in DNR fisheries department of the type and amount of post secondary preparation for this kind of work as well as the daily expectations and responsibilities. Many students who are avid outdoors enthusiasts have expressed interest in this type of career but are surprised to find out how rigorous the training is and how competitive the field is. I can better let them know what to expect in this area.”

--Dave Millis, science teacher at Edgewood-Colesburg High School

Logan Mork

Tallgrass Prairie Center

Cedar Falls, IA



Logan's main role was to help maintain the current production plots that will provide seed to growers which can be used in Iowa's integrated roadside vegetation management program. Logan's work with the Tallgrass Prairie Center will allow him to take steps in the restoration and management of a prairie at the high school.



“While working at the Tallgrass Prairie Center I have found myself applying similar content knowledge that I teach in a new situation every day. Employees need to understand plant structures, needs, development, and the impacts they have on various ecosystems when they start a prairie restoration.”

--Logan Mork, science teacher at Cedar Falls High School

Paul Mугan

Tallgrass Prairie Center,

Cedar Falls, IA

The UNI Tallgrass Prairie Center's mission states that their purpose is to: "Restore native vegetation for the benefit of society and the environment, with research, education and technology." Paul's work let him learn how to restore and manage the two prairie patches that have been developed by the WSR school system. These include the well established prairie behind Southeast Elementary and the area just North of WSR Middle School that has been seeded but needs further developed. Paul is excited to see students put their efforts into these



Tallgrass Prairie
CENTER

UNIVERSITY OF NORTHERN IOWA

www.tallgrassprairiecenter.org

prairies.

"Prairies have such an amazing impact on so many areas of concern for Iowa. They address the issues of water quality as they reduce both sediment and nutrient pollution. Prairies provide habitat for a variety of animals. In addition, because we live in one of the most dramatically altered biomes on the planet, a prairie is an important connection to Iowa's past. I foresee the TPC becoming the go-to resource for Iowa schools that are restoring these vital natural spaces. "

--Paul Mугan, biology teacher at Waverly-Shell Rock High School

Alex O'Connell

John Deere PEC

Waterloo, IA



Alex worked with a team to help analyze data focused on quality control. This information will be used to help to improve the quality of products that go through production in the future. Alex also helped in the engineering and testing of utility tractors. Through this externship, Alex is seeing first-hand how mathematics is used to help manufacturing companies and create quality products for the consumer.



“The geometry applications they can create using CREO are unbelievable. I am currently trying to create a 3 point hitch model that can be used to see the movement of parts in space. What I thought would be a pretty simple task has turned into much more thinking about all of the different planes that parts are rotating through.”

--Alex O'Connell, math teacher at Jesup High School

Stephanie Peters

John Deere Engine Works

Waterloo, IA

Stephanie's goal this summer was to create a curriculum guide that works with a mini-robot, like ones that are on Deere's line floor, in both the small and large sizes. This guide would allow students to interact with the robot, use program code, and would mimic operations performed on the line. Students would be asked to collaborate, problem-solve, and attempt to build a diesel engine similar to that which is done while at Engine Works. The purpose of this project is to improve Deere's STEM-related exploration days and encourage students to consider the skills and qualities they possess when thinking about their future.



"Continued contacts between John Deere and the classroom must keep happening and can start early. If contact is made in the elementary years, by bringing hands-on materials and people to the classrooms to have conversations and build interest, students are more likely to express excitement about skilled trades and industrial production as they get older."

--Stephanie Peters, teacher at Lowell Elementary School in Waterloo

Adam Reilly

TDS Automation

Waverly, IA

Adam worked at TDS's (Doerfer) Waverly and Waterloo sites helping to implement a 5S program. 5S (Sort, Set in Order, Shine, Standardize, and Sustain) is a way of improving lean manufacturing. By helping to implement the 5S philosophy, Adam worked to streamline the manufacturing process at TDS Automation by eliminating waste and helped organize various areas.



“Problem solving skills are very critical to place like TDS, where very few items produced are the same. I have witnessed the need to constantly adapt and to find ways to “figure it out”. I try to instill in my students the need to figure things out, and that failing is going to occur, but you cannot let that stop you from attempting to solve your on problem(s). With this idea, I also reinforce to student to use all of their available resources to help them solve their problem(s).”

--Adam Reilly, industrial technology teacher at Cedar Falls High School

Alex Ruehlow

Geater Machining & Manufacturing

Independence, IA

This summer at Geater, Alex wrote step-by-step procedures for students to run equipment. He also worked on projects that will help students gain skills in machining, design, and sheet metal. The contribution that they are working towards is a partnership will both benefit both Geater and Jesup High School.



“Here at Geater I am seeing the workers use problem solving skills everyday to make parts that are what the customer want. This is something in my classroom that I never give my students a direct answer on how to do something unless they absolutely can't get it. We also talk about constructive criticism and how they need to be able to accept it so they can get better... One way that I am going to work on skills this year is teamwork. They are going to have to create their projects with another person in the class so that they can bounce ideas off one another.”

--Alex Ruehlow, industrial technology & engineering teacher at Jesup High School

Sean Singewald

Iowa DNR-Decorah Fish Hatchery

Decorah, IA



Sean learned about the fish raising process, stocking practices, the engineering of the hatcheries, sampling methods, and wildlife management practices. One of his projects was catfish and turtle surveys. He plans on using this information to create real life learning opportunities in his classroom.



“I am trying to work into my class designed failures and opportunities for students to question. So much of science is questioning and observing. In the real world, you can't throw down you pen and say 'this is stupid' every time you encounter an obstacle. You have to figure it out (which goes with questioning and observing). You can't just run to your supervisor any time things don't go perfect.”

--Sean Singewald, science teacher at John R. Mott High School in Postville

Wade Stahr

Geater Machining & Manufacturing, Co.

Independence, IA

At Geater Machining Wade worked in the Proto cell where he operated a CNC vertical milling machine. While the projects differ, the procedure for each is basically the same. Each part may have a single or multiple operations, tooling setups and of course the all important control plan for inspection. This Externship was mutually beneficial as Geater got another machine operator and Wade was able to learn a process that is proven to work in industry.



“CNC courses teach G&M programming at a basic level, but with the new information I am acquiring here I will look to increase the depth in which the classes go. Communication is a huge part of the process; how can improvement be expected if this doesn't take place? I have students currently complete a Log or journal of daily processes, but I want to add to this and have them blog it out to the class and respond to each other.”

--Wade Stahr, industrial technology teacher at Independence High School

Robert Welter

Iowa DNR Big Marsh

Parkersburg, IA

Robert was a contributing part of many initiatives, including banding Doves and Canada Geese, planting food plots, and constructing Wood Turtle nest barriers for use in the conservation of that species. The tasks and projects he has been a part of have helped Robert to better appreciate the wide variety of skills needed in the modern workforce. He has seen multiple cases of technicians collaborating with each other, effectively communicating with the public on a host of issues, and problem solving to efficiently and effectively accomplish tasks. Robert also gained an array of content knowledge, most notably regarding prairie flora, animal ecology, and wildlife restoration.



“Before completing my two externships, I was a “knowledge” teacher - I figured if students knew enough about science, they could eventually become scientists or, at a minimum, become informed citizens. I have learned that knowledge is only part of my responsibility as a teacher. My students need to know how to apply their knowledge to new situations, be able to collaborate with others, and solve problems in which they may not be an expert.”

--Robert Welter, science teacher at Holmes Junior High in Cedar Falls

Stephan Woolery

John Deere PEC

Waterloo, IA



Steve has worked on multiple projects at John Deere PEC. The first was to search through data for parts ordered for tests that are stored at PEC. He was looking for parts ordered off-site that were in stock. With this information he generated a report to minimize wasted time waiting for parts that are already in house.

Another project Steve worked on was to devise a more efficient way to identify large material designated for scrapping.



“At John Deere PEC I have learned it is not expected that you know everything and that asking questions is expected. I think this applies to any job in any field. Because you don't know something does not mean you are failing at your job. In my classroom I encourage students to ask questions about the content that they do not understand. Asking questions shows that you are committed to learning.”

--Stephan Woolery, math and science teacher at Valley Lutheran School in Cedar Falls