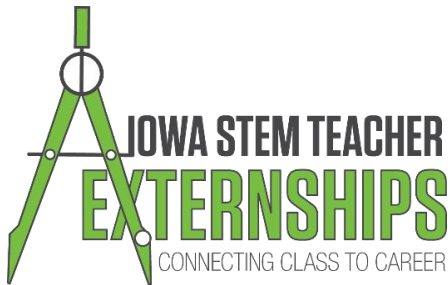


2021 Iowa STEM Teacher Externships

Extern Yearbook



Richard Adams

QC Analytical

Le Claire, IA



Richard learned and ran many tests in the lab to analyze client samples. The analytical techniques include a full range of instrumental methods (IC, GC, GC/MS, TOC, Flame AA), wet chemical analyses (COD, ammonia, TKN, FOG, Phenols, Cyanide, acidity/alkalinity or hardness titrations) and microbiological tests. Most of his time was spent preparing samples for testing, and he applied skills such as pipetting, distillation, titration, spreadsheet data input, and proprietary analysis software utilization each day.



"I have had discussions with all the staff here and we are definitely looking forward to bringing students to the lab (either in person or virtually). I can see students preparing samples in class, having the samples processed by the lab and then students get to look at the data and discuss with the lab operators what they are observing. "

--Richard Adams, science teacher at North Scott High School in Eldridge

Landon Ahlers

Rosenboom Machine & Tool

Sheldon, IA

Landon's main project was in the metal finishing department where conducted pH testing for rod coating solution. The chromic acid concentration is tested by a process of titration and the titration data is used to create graphs to see trends in the chromic acid solution that is used in the plating tanks. He also helped in the Research & Development department troubleshooting hydraulic cylinders. This has been a great way to see the scientific method in action, from forming a question to communicating results when the issue has been resolved.



"The biggest impact that I experienced... was seeing all of the 21st century skills in practice. There have been countless times where people and departments have worked together or worked with someone from another company and used critical thinking processes to solve something. "

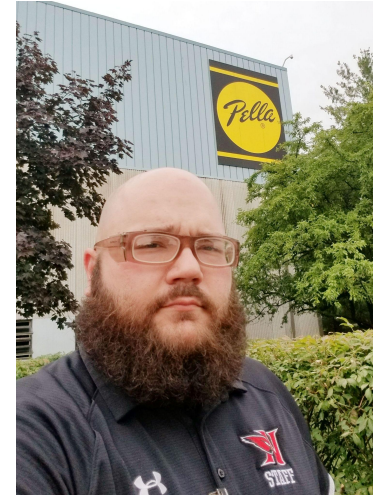
--Landon Ahlers, science teacher at George-Little Rock CSD

Derek Bair

Pella Corporation

Pella, IA

Derek worked with Manufacturing and Engineering Services (MES) where they design and build various aspects of their manufacturing process. He was able to complete onboarding and new hire training and then spent time with Tool and Die, Continuous Improvement, Electricians/Maintenance, Carpentry, and Safety. After participating in this externship, Derek would like to create a project where students have to analyze the cost and time of making a part or parts by hand versus automation.



“I have found with many of the technical fields, problem-solving is the biggest hurdle. Students have a fundamental deficit of logic understanding, especially, following a path and checking all routes.. I do teach some logic systems in my courses. I will have to get creative in the future to create more opportunities for students to solve problems and communicate.”

--Derek Bair, industrial technology teacher at Newton High School

Rachel Bell

Hy-Vee, Inc.

Grimes, IA



Rachel has been working in Hy-Vee's corporate IT offices. She has learned new skills within spreadsheet applications which incorporate and encourage communication and the interpretation of ideas. Rachel has seen first-hand the importance of soft skills such as organization, communication, critical thinking, and problem-solving. She has been encouraged that those everyday practices have value beyond school in many applications.



"My favorite part of my Externship was experiencing the corporate world. I had very flexible and cooperative supervisors who not only encouraged me to search the internet for ideas but who also wanted to learn more about what was found. When given the time to search and learn properly, I felt much more empowered to learn new ideas."

--Rachel Bell, math teacher at Indianola High School

Bailey Bergman

Buchanan County Conservation

Hazleton, IA



Bailey worked at Fontana Interpretive Nature Center with their naturalists, helping to run nature day camps. She also developed lessons for Envirothon, a national environmental science competition for high school students, and identified ways the naturalists can help teachers bring this amazing program to their students. Other duties included feeding program animals, helping with planting projects around the park, and other jobs a naturalist would normally do.



"I think the biggest thing for me to keep the connection with Fontana is designing field trips that bring us out here more than once. We could do data collection and then come back out to present or implement a solution to an issue. I know I will definitely be keeping Fontana in mind when coming up with activities."

--Bailey Bergman, science teacher at West Central School in Maynard

Natalie Brimeyer

Jasper County Conservation

Newton, IA



Natalie helped the naturalists run a variety of wilderness camps for local students where they teach the kids how to identify different species, how to fish, and other outdoor activities. She also helped check on prairies, measure water quality, surveyed the wildlife in the newly donated parks, and worked with the public. Her main project was to plan and conduct her own wilderness camp, which included learning how to identify trees, flowers, water insects, and types of animal tracks.



"This Externship has allowed me to learn about different job options for kids looking to go into STEM career fields. When kids ask me what they can do with a biology degree, I often give them very broad and generic answers. After this externship I think I will be able to give them more specifics on what they can do with a variety of STEM degrees."

--Natalie Brimeyer, science teacher at Southeast Polk High School in Pleasant Hill

Adam Brown

HNI Corp.

Muscatine, IA



Adam worked with HNI's Customer Experience Center (CXC) on the Data Factory Team. His project was to update a current Power BI summary. The summary is visualizations of Member (employee) Implemented ideas. Adam was asked to add another dynamic to the data summary, changing it from a plain bar chart to a stacked bar chart with line graph as well. Each of the bars will still show the total for selected filters, but it can be broken into smaller categories as well. The ultimate goal is to show the percentage of employees under each manager that have had an approved idea for each week.



"I will forget all kinds of things in my life but when I am 90 and senile I will know what a pareto is! Mistakes force learning, and learning that was forced from those mistakes gets ingrained into our brains. So my students will know it is ok to fail, as long as we "fail fast, and fail forward""

--Adam Brown, math teacher at Frank Smart Jr. High in Davenport

Robert Brown II

Johnson County Conservation

Oxford, IA



Robert participated in an Iowa STEM Externship this summer with Johnson County Conservation at F.W. Kent Park. Robert was a part of a team that was responsible for water testing at 31 locations throughout the park. He was also part of a team that analyzed the data collected from the sites to determine if the rehabilitation of the watershed feeding the lake was successful.



"I am learning that the ability to be able to communicate is still so very important, even though we are working outside, we are collecting data and still need to be able to communicate that data and think about the results that we obtain."

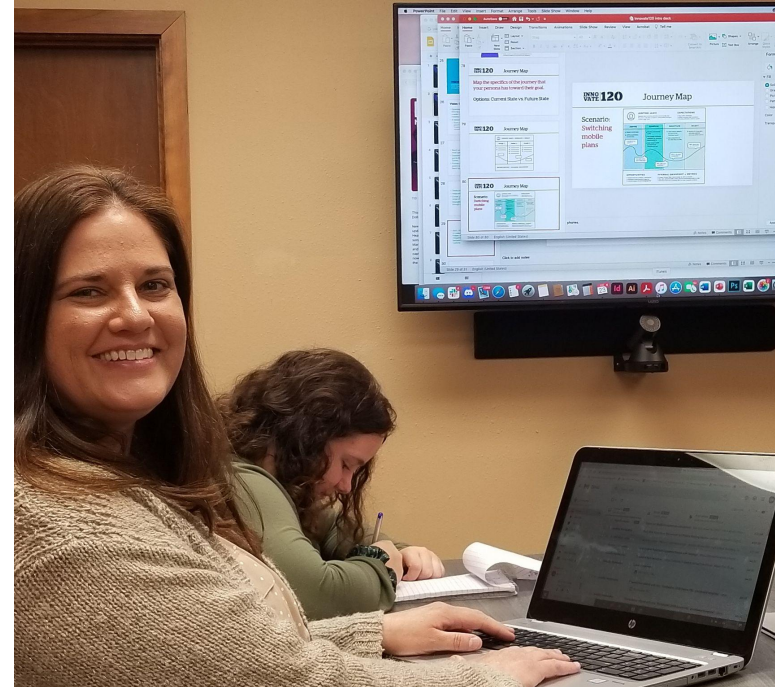
--Robert Brown, science teacher at Jefferson High School in Cedar Rapids

Jennifer Buckwalter

Innovate 120

Maquoketa, IA

Jennifer is assisting with communicating real companies' goals and deadlines to the four teams of high school interns at Innovate 120. She provides guidance to the students, motivates team members and assesses performance. She keeps management updated on the teams' performance. Jennifer will take what she is learning and develop many ideas to make her classroom more real-world.



"I try hard to relate content to the real-world and show students there is real-world meaning behind the different contents they are given. After my last externship, I did add things such as having students present more, talk to people more if it was either in person or over the phone. I even challenged my business club members to do more of these things too."

--Jennifer Buckwalter, business teacher at Muscatine High School

Tracy Burds

Jones County Conservation

Center Junction, IA



Tracy assisted with various programs hosted off-site and at the Nature Center. She created geocaches as well as compass courses throughout the park. The geocaches will offer a treasure-hunt style experience by providing GPS coordinates to find a specific location. The compass courses will provide a list of directions that require the use of a compass to navigate a course. Tracy also created videos to promote some of the opportunities that Jones County Parks offer to the public.



"...with each day spent at Central Park, I came up with plenty of ideas to bring back to the classroom. I have at least 4 units (almost 3 finished) that I'm hoping to get developed to use this upcoming year. All of them relate to the work or learning that I did and should be very hands-on and engaging for students."

--Tracy Burds, science teacher at Central City High School

Matt Cain

Pearson

Iowa City, IA



Matt worked with Pearson Education's software development groups to help implement and improve new cloud-based software platforms for PLTW and Computer Science coursework. He also helped develop and implement programs to engage students in machine learning and web development. The summer will hopefully end with sitting for the Amazon Web Service Cloud Practitioner certification exam.



"I think the best I can do in this is to meet students at a human level as much as possible and find as much meaningful motivation as I can there. Sometimes its because it may be helpful in a job, sometimes it may be a chance to nerd out with them, and other times it is because we just have to."

--Matt Cain, science and computer science, teacher at West Branch High School

Brianna Call

US Army Corps of Engineers

Rock Island, IL



US Army Corps
of Engineers®
Rock Island District

Brianna's focus this summer was a flood regeneration project, which consists of counting and identifying plants that have regrown since the flood in 2019. Brianna counted and identified the species of plants in a plot while determining the coverage of the floor. Two witness trees were marked to triangulate the position using azimuth so the plot can be identified in the future. She also measured the diameter and identified the health of each tree in the plot; i.e. healthy, stressed, or dead. The project has over 40 plots that are being studied which can be compared to data taken from a parallel study performed 15 years ago.



"While we are teaching our students, there is a vast difference between an effective teacher/lesson and an ineffective one. I personally believe engagement is key and shying away from cramming test scenarios. The more we can be excited and involve our students the more possibility there is that they can remember what they have been taught because the opportunities to apply what they are learning is higher."

--Brianna Call, teacher at Bridgeview Elementary in Le Claire

Camille Chalkley

University of Iowa Office of Sustainability

Iowa City, IA



Camille learned about the various sustainability initiatives, projects, and programs at the university and the interactions in sustainability between social equity, the environment, and the economy. Camille worked on a prairie reconstruction project at the Ashton Cross Country Course in Iowa City and is implementing what she has learned in lessons, projects, and resources that teach sustainability and these interactions in K-12 classrooms.



"In the classroom, I would like to create more projects that are centered around systems thinking and connections in our units. In addition, I am always trying to include more opportunities for students to collaborate and work with others. "

--Camille Chalkley, science teacher at Elizabeth Tate High School in Iowa City

Nick Colle

Blank Park Zoo

Des Moines, IA

Nicholas worked in the Zoo's education department, helping with the Summer Safari camp. His main job was to design high-quality STEM lessons for 1st through 7th graders. The Blank Park Zoo focuses on education and conservation, hoping to inspire people to value the natural world. Teaching high quality STEM lessons during Safari Summer camp will help the Blank Park Zoo achieve its mission of educating the public.



"I think I need to give my students more opportunities to practice using these [21st Century] skills. Moving away from a lecture style-classroom and into a project-based classroom would be very beneficial for my students. In a project-based classroom, students must use all of the 21st Century Skills."

--Nick Colle, science teacher at Dowling Catholic High School in West Des Moines

Ann Conklin

Johnson County Conservation

Oxford, IA



Ann Conklin was stationed at F.W. Kent Park as a member of the water quality monitoring team. Besides collecting and testing water samples from 31 sites, she also analyzed data from previous years in an effort to better understand how pollution mitigation efforts in Johnson County have impacted water quality.



"Anytime we can get students in Iowa interested and involved in prairie restoration is a positive thing; very few Iowans realize how fragmented and fundamentally disturbed our lands are... I would like to bring students out to participate in placement of submerged piers (planting of aquatic vegetation for fish habitat) and/or prairie planting or burning."

--Ann Conklin, spanish teacher at Williamsburg Junior-High School

Matt Cook

Iowa DNR

Miles, IA

Matt's responsibilities consisted of assisting in the maintenance of habitats and food sources for both harvestable and non-harvestable wildlife. He also banded Geese and Doves, and worked on the placement of Barn Owl nesting boxes, Barn Owls being an endangered species in Iowa. He learned quite a bit about how much work goes into keeping Iowa's game populations thriving and helping the indigenous populations maintain their numbers.



"The chance that someone would film me flipping into the water, get mauled by a stressed goose, was in the back of my mind some of the time, and I realized that many of my students probably feel the same way in my classroom. Banding geese on the Mississippi is one of the greatest experiences of my life and not because of the birds and what I learned about them but what I learned about myself because of the support of the people around me."

--Matt Cook, science teacher at Bellevue Community School District

Yvonne Copper

Zoetis

Charles City, IA

Yvonne Copper is working with the Operations Excellence (OPEX) to seek out problems that are contributing to revenue loss. By locating and resolving these problems using the Lean Six Sigma process, they will be able to reduce waste and save money. Yvonne observes the Lean Six Sigma process by attending problem solving meetings with other OPEX team members. She is working on projects to develop standard work documents which will be used to clarify and refine procedures to make them as efficient as possible. Yvonne is also helping to develop activities for future employee trainings on the Lean Six Sigma process.



"The entire experience I have had at Zoetis was absolutely fabulous! I have been able to see science content being used every day here at Zoetis. I will be able to explain to my students why we are learning science content, and that it is used in business settings."

--Yvonne Copper, science teacher at Charles City High School

Nicole Cote

Whiterock Conservancy

Coon Rapids, IA



Nicole worked on the fishing ponds in the recreational park of the area. She tested the pH levels to determine if the water is in a safe range for the fish in the pond. The levels of nitrates and phosphates are also important to see if there is eutrophication that may be a problem as well for the fish. Different temperatures can also lead to fish kills and the amount of dissolved oxygen too. Collecting all this data can benefit Whiterock because there haven't been as many people fishing and it could be due to lack of fish caused by any one of the above mentioned tests she did.



"At Whiterock Conservancy I believe the biggest skill I think that is required is communication. There are so many projects and tasks that need done at Whiterock that there has to be communication. Every morning about 7:30 everyone is gathered at the shop and talk about what they are doing for the day. "

--Nicole Cote, science teacher at Carroll High School

Jordan Downing

Pella Corporation

Pella, IA



Jordan spent his time in the MES (Manufacturing Engineering Services) Plant which specializes in building the production equipment. Jordan was able to meet with workers of all levels and positions in the plant to see how production works and the job opportunities available in this type of production. He learned what each job entailed and the career path to get there. He also worked with a construction crew to help break out and pour sections of concrete in the facility. Other projects included welding up a base for a new piece of equipment and helping build hundreds of racks that will hold parts on a future production line.



"This externship has given me the opportunity to connect with more professionals. Another way that I may be able to work with Pella Corp. is that sometimes the carpentry shop needs large productions of material holders that my class could maybe make in my Mass Production project. "

--Jordan Downing, industrial technology teacher at Knoxville High School

Mark Drier

GMT Corporation

Waverly, IA



At GMT, Mark helped improve production, quality and safety initiatives set forth by GMT and its customers. Mark observed machinists to understand the parts flowing through the area and identified ways to help the operators work in a safer and more effective manner while meeting daily production goals. He also participated in new employee training where new hires can earn a higher certification level in order to increase their pay while working at GMT.



"Once you leave the education silo, you are now in the workplace silo and learners are out on their own. By bringing the workplace during education you are doing the community, the school and your students a gift that would promote the fact that education skills should be used in the workplace."

--Mark Drier, math teacher at West Fork Schools in Sheffield

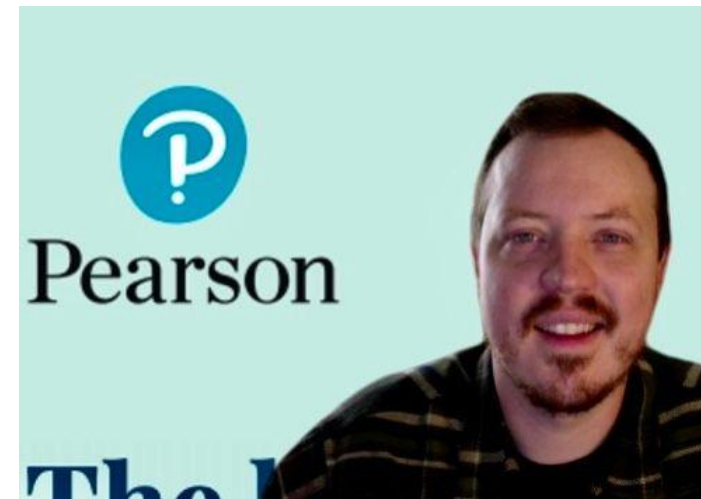
Nathan Elliot

Pearson

Iowa City, IA



Nathan worked with Pearson's information security, data privacy and technology implementation teams . He was given the opportunity to learn and be certified as an AWS Cloud Practitioner. He was part of a study group alongside other Pearson employees trying to earn the certification. Nathan was also able to help give feedback with a newly implemented pilot program with a Minnesota school district and Pearson.



"After my externship it caused me to visualize what my students might be like as employees of my host site. I looked more for ways to give feedback on their 21st century skills rather than just their mastery of the content. I was able to see the 21st century skills of my students just by discussing how important they were in my externship."

--Nathan Elliot, math and computer science, teacher at Clear Creek Amana High School

Randi Endriss

Omaha Zoo Wildlife Park

Omaha, NE

Randi worked with the zoo's education department with their zoo camps, including an Around the World camp, Week of Wildlife, and Endangered Animals camp. She also helped the Zoo Crew, which brings in volunteers from grades 4th-12th to learn about the variety of jobs the zoo offers, and different exposure to the jobs (shadowing, observations, touring areas, etc.). She was able to focus on the career possibilities at the zoo and how she can bring that back to the classroom. She wants students to see that zoo jobs are more than "zoo keepers", and that there is something for almost everyone at the zoo.



"I am excited to find all the connections that are possible between [school and the Zoo]!! Seeing these connections will help my students and community see what is offered through the zoo outside of just visiting the zoo for the day!!"

-- Randi Endriss, TAG teacher at Treynor Community Schools

Grant Erickson

Scott County Conservation

Dixon, IA



Grant's main externship project was to evaluate current programming that the Wapsi River EE Center provides and align it to the Iowa Core science standards. Grant specifically worked on the curriculum that the Pleasant Valley 5th grade students participate in during their winter field trip to the Wapsi River EE Center. He added to their current curriculum so the topics reinforce the 5th grade content. A curriculum map was developed so that the staff knows the depth and vocab used for topics taught in the classroom. This was an important component for the Wapsi staff so they can build off of the students prior knowledge and use common terminology.



"I enjoyed seeing the passion the naturalists have. We'd be hard at work and everything would stop if they saw, for example, a caterpillar. Working with them has made me look at nature through a different lens and helped me to understand that it's alright to pause and observe instead of constantly pushing forward."

--Grant Erickson, teacher at Pleasant View Elementary School in Bettendorf

Amber Fairbanks

Iowa PBS

Johnston, IA

Amber worked with the Education team on the Iowa Science Phenomena website (<https://phenomena.iowapbs.org/>). She collaborated with them on the development of new phenomena resources for the site by reviewing prior Iowa PBS video footage and reviewing existing submissions. She also collaborated on the creation of a phenomena video from start to finish; working alongside producers, editors and camera crew.



"My biggest takeaway from this week is how I have been trying to incorporate and where my shortcomings were in achieving that. Working here has allowed me to see and participate in a structured organization, and that is something that I will be bringing to the classroom. "

--Amber Fairbanks, science teacher at Waukee High School

Blake Fehringer

Interstates

Sioux Center, IA



Blake's duties included participation in F.A.T. (Factory Automation Training) Camp, which focuses on the control systems aspect of a project. Blake worked on PLC (Programmable Logic Controller) and HMI (Human Machine Interface) software's and functionalities. The goal of the PLC was to program a grain bin to receive, dry, and load product. The HMI displays were created to show what operations the PLC was performing and if there were any complications. He also visited the panel shop where he saw the physical components he was programming and how they are installed into a panel.



"I believe that inspiring the love of learning begins with sparking a students interest. One way to spark students interest is to relate the content you are teaching to the real world. If you can show students the real world application of the content, the easier it will be to motivate them to dig deeper into the content."

--Blake Fehringer, industrial tech teacher at Le Mars Community Schools

Courtney Giesel

Lee County Conservation

Montrose, IA



Courtney developed an educational program on freshwater river mussels. She toured interpretive centers and museums, kayaked on the Mississippi River to survey the mussel population, and researched and wrote a curriculum that supports mussel conservation and educational outreach. Some of her side projects include making promotional videos for the county parks, updating the landscaping of the Lee County Conservation Center, and assisting with the environmental education programs.



“This externship has been a great exercise in critical thinking for me. I have had to be independent and able to think on-my-feet because they are not babysitting me or telling me exactly what to do every second. I know that there are businesses out there (e.g Google and Principal) that give this type of freedom to their employees so I need to start thinking about how this level of critical thinking is going to look in my classroom in the future.”

--Courtney Giesel, science teacher at Keokuk High School

Lindsey Gosse

HNI Corp.

Muscatine, IA



Lindsey worked with HON's finance, marketing, and education teams to help plan the launch of the education line of office furniture. She researched and analyzed content from the marketing aspects in education to the data collected from their previous sales in education.



"I'm excited to go back in the fall with more information about opportunities for the kids wanting to go into general labor, the skilled trades, AND college. I feel like I have a much better understanding of what success can look like from every level of education than I did a month ago."

--Lindsey Gosse, math teacher at Davenport West High School

Jay Grimes

Foundation Analytical

Cherokee, IA



Foundation
Analytical Laboratory

Jay's primary job was to prepare lab samples of specific pet foods allowing for the quantification of fatty acid methyl esters (FAME) using gas chromatography, of which the results will be used to show method precision and repeatability. Jay also worked with the computer software that controls the gas chromatograph ion detector and gained a basic understanding of how the GCID operates and how to evaluate the data collected.



*"While at Foundation Analytical Laboratory, I have used science skills that I learned in high school, college, the military, and in private business, such as measurements, sig figs, accuracy, precision, and the handling and use of numerous pieces of test equipment and tools. These are simply skills that don't require much thinking. However, the BEST SKILL to learn and keep is **how to figure things out.**"*

--Jay Grimes, science teacher at Storm Lake High School

Megan Hamm

Iowa DNR at George Wyth Park

Waterloo, IA



Megan collected data at the park which included creating different types of surveys for the park guests. The park will use the data to better understand what guests use the park for and to improve different aspects of the park.. Another project was updating the kiosks or information stations located throughout the park. These kiosks have QR codes guests can scan to learn more information about different aspects of the park from the campgrounds to the trails. In the kiosk, there will also be background information on the tree project George Wyth recently did along with wildlife information guests could see while they are at the park.



"After doing the externship previously, I have seen how important soft skills are within the workplace. Because of what I have seen during my externship, this last year I implemented 21st Century Skills in my classroom Overall, I can tell that this is helping my students prepare for the future."

--Megan Hamm, science teacher at Denver High School

Matthew Harder

The Merrill Company

Spencer, IA

Matthew worked in Merrill's Pricing and Product Department. He analyzed historical sales data help with inventory management, created a reporting method to monitor inflation in a variety of product categories, and developed formulas and processes to investigate the seasonality of sales for future predictions. He also worked with data smoothing methods to explore trends of individual products on a variety of timeframes.



"I want to set the class culture from day one as a professional workplace. That does not mean it is all business all the time; but when it is time to work, get it done. Most students probably don't realize how a workplace functions, and I will be happy to share examples and illustrate key features."

--Matt Harder, math teacher at Graettinger-Terril High School

Albert Hayton

Elkay Manufacturing

Savanna, IL



Albert worked with Elkay's production improvement department this summer. His duties were to take photos of Elkay's parts and production lines and create Virtual Assembly Line Info Sheets. As parts and products are produced by the employee's they use the info sheets Albert created to assemble those parts and products. Albert has been a big asset to Elkay's production improvement department and has filled a void this summer that has freed up others get things accomplished.



"One of the biggest things students will need to work on is time management. Those that may have struggled before Covid-19 are now even low in this skill/ It is crucial for them to learn this skill in school so they can carry it to their future employers. "

--Albert Hayton, math teacher at Clinton High School

Donovan Hill

Accumold

Ankeny, IA

Donovan worked with the quality department on various projects to help ensure that the products are meeting the company standards. This included data collection and analysis on products as well as creating directions for employees to use time-saving and error-reduction programs. This experience allowed Donovan to gain a better perspective on the way businesses operate as well as learn about particular programs and problem-solving that students must be able to use in the work environment.



"I feel that the employability skills stick out to me even more so after having been in a business for a few weeks. This is especially true for the communication piece of the employability skills in the Iowa Core. I am struck by how much communication takes place from layer to layer at the business as well as within the same level on issues."

--Donovan Hill, STEM teacher at Bondurant-Farrar Schools

Mary Hodak

Iowa DNR

Clear Lake, IA



Mary's externship included sampling fish population and biodiversity in the 12 county area, which helps the DNR monitor the health of the ecosystem and helps them manage, and regulate recreational fishing. She also helped with the tracking and banding Canada Geese and a population study of a threatened species of great concern, the Blanding's turtle.



"When visiting with the different staff members, I am finding some are willing to come to the classroom to talk to the students about what they are doing and so I am very encouraged by this. I love having professionals come into the classroom and give the students a break from always hearing from me day in and day out."

--Mary Hodak, science teacher at Central Springs High School in Manly

Margaret Hogan

Buchanan County Conservation

Hazleton, IA



At Fontana Park, Margaret participated in outdoor activities, ranging from clearing and planting prairies to exploring ways to recycle trash into usable items. Her duties included caring for animals at the Nature Center, assisting with outdoor camps, and developing a workshop for teachers based on the BEETLES environmental education program. These experiences will help her educate her students to be more conscious of the positive impact that they can have on their environment.



"I think that going outside one's comfort zone is a workplace skill that we teachers should model and encourage our students to engage in more often. This Externship and past Externships have certainly provided me with this opportunity, as well as the opportunity to meet some amazing people."

--Margaret Hogan, science teacher at Beckman Catholic High School in Dyersville

Jessica Howard

Stanley Consultants

Muscatine, IA

Jessica's externship focused on how Stanley Consultants persevered through the pandemic, how the company relies on members to deliver results, and process improvements to meet business needs. She worked on continuous improvement, collaboration across organizational boundaries, and providing input on the learning process for Stanley Consultants members. Working with experts she created microlearning segments to facilitate efficiency and a productivity requirement was mapped to facilitate the delivery of a project delivery model.



"Students can enjoy the learning process when it's easy to see how it will apply to their real lives. It isn't just some obscure content to be ingested. It is the real-life skills that get their attention and allow them to continue to apply it to their futures."

--Jessica Howard, business teacher at Lone Tree Community Schools

Sam Howard

Jackson County Conservation

Maquoketa, IA



Sam helped Naturalists with fishing, geocaching, canoeing, and kayaking activities in the multiple summer camps they have at Hurtsville Nature Center, including taking the campers to Maquoketa Caves for some spelunking adventures. He also helped complete an inventory of native prairie plants on several remnant hill prairies. Sam also created several interpretive signs at the center and Prairie Creek Recreation Area.



"[Skills and content] is a delicate balance. Too much focus on one or the other can burn students out. Kids get tired of spending too much time on one or the other. A blended learning approach is definitely the way to go. PBL really lends to this approach. Plus it allows students to dig deeper into the things they are more passionate about."

--Sam Howard, science teacher at Northeast CSD in Goose Lake

Angela Hunter

Iowa DNR

Riverton, IA



Angela's Externship project was started last year and attempts to solve the problem of debris created by beavers by building a beaver management device that allows water to flow through a culvert that has been plugged by beavers, tricking them to stop building in that location. This year the device is being finished and installed as well as monitored for effectiveness. If the device reduces the man hours required dealing with beavers, the DNR would like to install more in other plugged waterways.



"The most impactful part of my externship was meeting and experiencing the partner collaboration between many different conservation organizations that work to restore and protect the lands and waters. "

--Angela Hunter, science teacher at Shenandoah Middle School

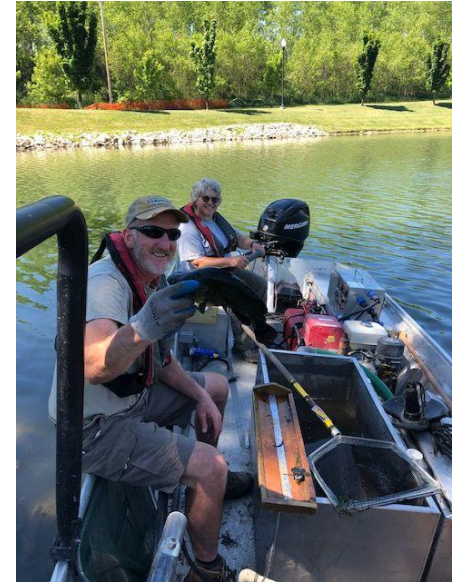
Brad Johansen

Iowa DNR

Decorah, IA



Brad was immersed in all facets of operation of the Chuck Gipp Fish Hatchery. He stocked fish in streams throughout N.E. Iowa, which included weighing, loading, unloading and putting fish in streams. He took part in feeding fish twice a day and maintaining the raceways for optimal fish health, which included the non-technical (powerwashing) to the technical. (taking D.O. readings and flow rates). He also participated in electroshocking for population counts, stream population restructuring, catfish netting, turtle traps, access improvements, water quality analysis, etc.



"Just by talking with the Hatchery and Fisheries staff here in Decorah they are now more aware of the projects that can be done by Decorah High School. The industrial tech program for example has commissioned work for many organizations and business in town. That opportunity to do work for the hatchery in such a public place with high expectation for the end product is very real world."

--Brad Johansen, science teacher at Decorah High School

Kelli Keefer

VMware

Des Moines, IA



VMware which is a technology company that offers a variety of software to companies including things that allow for App Modernization, Cloud, Networking & Security and Digital Workspace. Kelli worked with the Head of Analytics and Insights helping to gather information from different departments to highlight how VMware products provide data to customers and how that data can be used to make a positive impact on business decisions.

"In the workplace employees tend to be working on multiple things at once and have to prioritize and figure out when they will work on each item. I wanted students to have that same experience so I found different ways to do that with activities and smaller projects. It wasn't always easy but it was one way to give students a more real-world experience in the classroom."

--Kelli Keefer, business teacher at Knoxville High School

Rachna Khanna

The Weitz Company

Des Moines, IA

Rachna's duties included updating existing onboarding and offboarding documents and layouts in the service documents of a construction company. She also helped create new templates which can be used as a reference to their future documents. She was also involved in setting proper layout of documents in their folders and file system for the ease of the users. This will help new user and admins to work with ease and confidence by simply following the instructions.



"I feel that this has easily been my largest takeaway from this project so far where I am realizing that effective communication and problem solving is an important aspect and If my students are well prepared for that they will be able to face all the challenges they will come across in their professional or personal life. I have loved this experience for that very reason!"

--Rachna Khanna, business teacher at Dowling Catholic High School in West Des Moines

Jeff Kruger

Sudenga

George, IA

Jeff's primary job has been welding parts and components for the Dura-Lift product line. He collaborated with the welding supervisor to weld the parts, which involved how to read different types of weldment symbols, how certain products go together, and how to better his techniques to accomplish certain types of welds. Jeff also received feedback from other supervisors about what kind of qualities and skill-sets they look for in employees. With that feedback, Jeff feels he can help his students develop into the type of employees they are looking for.



"The most impactful part of my externship would have to be the welding experience... These skills are something I will definitely take back with me to my classroom and shop. Not only are these hands-on skills important, but having discussion with other supervisors and the general manager, they really emphasized trying to implant those 21st century and soft skills into the students."

--Jeff Kruger, industrial technology teacher at George-Little Rock Schools

Jason Landa

Innovate 120

Maquoketa, IA



Jason's duties included helping set up the technology and re-gearing professional materials for high school level students. He also was a project manager, making sure that the students were applying the lessons from the director and the guest experts, maintaining progress on the projects, and helping the students have a deliverable to show real clients their solution to their design problem.



"I have found that the more students interact with actual industry professionals, the more excited they get and the more relevant they feel their task is to actual industry. High school students have very short memories when it comes to "why" their tasks are important and "how" their tasks relate to the real world answering their question "When am I going to need this?""

--Jason Landa, computer science and math teacher at Pleasant Valley High School

Mary Lazard

Des Moines Parks and Recreation

Des Moines, IA



Des Moines Parks and Recreation is responsible for managing over 4,000 acres of land and 76 parks across Des Moines. Mary has been logging assets at the city parks to create a baseline inventory of their facilities. This will assist park planners by giving them the ability to analyze the data of these facilities and identify gaps, create capital improvement plans, & improve preventative maintenance.



"While creating/updating parks they need to use creativity as well as being mindful of any group that they might exclude due to physical barriers. In the classroom, I could have students look more at each other's work in order make it more evident that their work must be done in a way that others can understand it - alternating partners and groups often."

--Mary Lazard, teacher at West Marshall in State Center

Shelby Lindaman

Iowa Department for the Blind

Des Moines, IA

Shelby participated in a week-long training where she was taught how to non-visually travel, cook, create in shop class, type Braille and use technology. After the training, she applied those skills to help pull books and plan for the library youth and LEAD programming. Shelby has also embarked on the mighty task in making differentiated math kits accessible for blind students, as well as choosing some of the activities to be set up in the maker's space. Once these math and STEM kits are ready, teachers and students will be able to check them out for use. She has learned so much during her time here!



"PBL projects are the perfect opportunity to bring the community into our classrooms! Students enjoy showing off their learning and it makes the experience more meaningful when they have guests that they have not met before or who aren't usually in the classroom."

--Shelby Lindaman, math teacher at Prairie Ridge Middle School in Ankeny

Neftali Lopez Duprey

HNI Corp.

Muscatine, IA



Neftali's projects aimed to answer the questions: Why are royalties differing in the company's system to what is being paid to designers? Can we identify a significant variance in royalty payouts that will allow us to make informed decisions about contracts? And, Is there a correlation with invoice sales and operating expenses? He worked extensively with Excel and other database software to find patterns in variances of royalty payments and looking at how an increase in invoice sales will increase earnings before taxes.



"One aspect that I have noticed at HBF (a small company within HNI) is how mathematical practices are being used and how useful they are here in the office. I have witnessed all my coworkers use all 8 of the mathematical practices every day. It is extremely satisfying seeing these practices being used by professionals outside of the classroom."

--Neftali Lopez-Duprey, math teacher at Muscatine High School

Ronda McCarthy

City of Des Moines Public Works, Forestry Department

Des Moines, IA



Ronda's first project was to update the city's database called TreeKeeper which holds the species, size and condition of each tree planted in the city's right of way and city parks. She also helped with the Tiny Trees Project, an effort to fill the nearly 8,000 vacant spots for trees around Des Moines neighborhoods, and learned how to conduct site analyses to determine where a tree would best fit into the existing environment. Ronda was able to be part of the volunteer crew that planted these tiny trees after they were started from seeds in a gravel pit.



"I learned that there are many opportunities for students to pursue careers with the city departments. It takes so much to run a city efficiently and I never really stopped to think about all that goes into each critical service that the city provides. I will be helping my students explore all of these different areas and what it really takes to keep a city running smoothly in every situation"

--Ronda McCarthy, teacher at St. Theresa Catholic School in Des Moines

Ashley Mitchell

Iowa Department for the Blind

Des Moines, IA

Ashley is helping with the Library's summer reading program this summer. This program is for kids who are blind and involves stories, crafts, questions, discussions, and fun! Ashley used her math skills to create materials for the summer reading program. She's also helping with a program for teens that is focusing on STEM this year. The students are coding, exploring physics topics, drones, and many other topics. Ashley will be helping students to explore the different STEM careers that are available.



"I love being outside of a school environment to see where the math I teach is being used in jobs. In the library, I have seen many practical applications of math from their numbering system of books to creating crafts for a large group of kids."

--Ashley Mitchell, math teacher at St. Theresa Catholic School in Des Moines

Emily Nannenga

Iowa DNR

Ventura, IA



Emily worked on two main projects to support the DNR's Wildlife Management office. She captured, tagged, and tracked Blanding's turtles. The benefit of this project was to provide information that will be used to guide future wildlife habitat management. Her second project was a wildlife habitat management project for water fowl that targeted marsh and wetland type areas using grazing of various livestock to manage unfavorable plant life in hopes of encouraging growth of desired plant life. This project will help control desired species using natural management and promotes positive interactions between private farmers and the DNR.



"One of the biggest takeaways from this opportunity so far that I have had is the absolute need I have to input MUCH more independent critical problem solving in my classroom, not only with the PBL hopefully but just in general."

--Emily Nannenga, science teacher at Mason City High School

Marcus Patten

Whiterock Conservancy

Coon Rapids, IA



Marcus was part of the many projects and tasks that happen daily at Whiterock. He helped judge a fishing derby on his first day, and helped with daily maintenance such as cleaning up pollinator gardens, helped with Gator rentals, and removing invasive plants from the trails system. Marcus also got the opportunity to explore some of the old coal mines in the area, and hopes to bring this mysterious phenomenon to his classroom.



"For my 4th and 5th grade classes, I will change up a LOT since last year. I plan to more directly incorporate the actual activity of building rich soil... as many of my students are/will be full time farmers, I will absolutely show my students how one thing effects the next thing in our micro habitats."

--Marcus Patten, teacher at East Union Elementary in Afton

Tracy Pigott

Omaha Zoo Wildlife Park

Omaha, NE



Tracy worked primarily as an assistant with the 3-5 year old zoo camps. Her duties included reading to the children, helping with projects, and general instruction on topics for the week. Each camp focused on different animals or areas of the zoo. Tracy assisted with the walks within the zoo answering questions about the exhibits. An important part of the work involved keeping the students safe as they explored and learned.



"I have a new respect for the importance of communication and how it can enhance a learning environment. I will be incorporating more opportunities for communication and collaboration in my classroom next fall."

-- Tracy Pigott, teacher at Sacred Heart School in West Des Moines

Travis Pilch

Lee County Conservation

Montrose, IA



Travis helped develop educational materials and public outreach programs regarding native freshwater mussel species and native prairie plants. Climax Molybdenum Company of Fort Madison, Iowa, in cooperation with the Lee County (Iowa) Conservation Board, sponsored the Lee County Conservation externship efforts this summer.



"I prefer to design lessons that either start with (or incorporate along the way) student interests. At my rural school their interests are often career related, so my work is done in that regard--two birds with one stone--and everyone is happier due to student ownership of, and therefore superior engagement with, whatever we are learning. "

--Travis Pilch, science teacher at Easton Valley High School in Preston

Hayley Pratt

Corteva

Johnston, IA

Hayley worked in the Soybean Genome Engineering lab, which is responsible for transforming genes of interest into soybean plants. Her project was to determine if alterations are needed to the gene transfer procedure to optimize for the use of agrobacterium. The project focus was to determine if using a different concentration of bacteria, measured using optical density (OD), would result in higher levels of transformation.



"My classroom has a heavy focus on collaborative learning. This leads to students needing those real world skills to be able to accomplish their tasks in class. Combining content and the skills oftentimes give importance to both. Being able to use content in a collaborative setting helps deter the "why do I need to learn this" questions, but also, in a truly collaborative environment, students will realize the importance of a team."

--Hayley Pratt, science teacher at North High School in Des Moines

Dallas Pullen

Sac County Conservation

Sac City, IA



At Hagge Park, Dallas worked alongside the naturalist, and her main jobs were helping with summer camp and conducting educational programs at the county libraries and day care center. Dallas created tools/projects for camps and prepared over 200 story kits. She was also responsible for feeding the wildlife that is used to take out for programs. Dallas learned about opportunities citizens have when it comes to the resources available through the DNR and Conservation Center.



"Academic skills and 21st century skills are both important and need to be intertwined throughout the lessons. I believe specific tasks lend themselves to incorporate a skill or a content areas easier than others. When teachers are more energetic and have a passion or enthusiasm for the subject area it allows the students to feel the excitement for learning. "

--Dallas Pullen, teacher at East Sac County Elementary School in Sac City

Austin Read

Iowa DNR Prairie Resource Center

Lehigh, IA



Austin worked with the Prairie Resource Center at Brush Creek where his responsibilities include harvesting and organizing many different species of native prairie plants which can be sent to other restoration and reconstruction sites in Iowa. Other responsibilities included prairie maintenance to minimize weed growth and allow for healthy growth of the targeted plants and seeds.



“One of the main goals of the PRC is to plant and expand Iowa's prairies, so after students learn about the work they do we could engage in some sort of activity where we help in the restoration of the prairie by helping to plant one or by visiting the PRC”

--Austin Read, science teacher at Fort Dodge High School

Chet Reagan

Iowa DNR at Sweet Marsh

Sumner, IA



Chet worked and learned from the Biologist and Wildlife Management Technicians that make up the Sweet Marsh Wildlife unit. While there he planted food plots, captured and banded Canadian Geese, Mourning Doves and Wood Ducks. He also explored the giant science lab that are the wildlife management units. Chet participated in the day-to-day activities of mowing grass, maintaining hardwood tree plantings. and engaging in many learning activities and conversations with his co-workers.



David Sattgast

Iowa DNR

Manchester, IA



David gathered data for the fisheries management team to help them with their long term management plans, and assisted in the rearing of trout for the production team. Another summer project was to test the effectiveness of an ultraviolet filtration system on reducing mortality in eggs and fry due to an aquatic fungus. All of these experiences will help David lead his students to the big thing in science education - answering the question, "Why is this happening?"



"I am rapidly realizing how much this fish hatchery is data driven. In order to keep (at the beginning of the week) 375,000 trout alive and in good health, you can't leave a lot up to chance. Incoming water quality has to be checked. They supersaturate the water with oxygen before it goes to the fish. Feed rates need calculated, mortality rates monitored, treatments devised if mortality rates are outside of established ranges."

--David Sattgast, science teacher at North Linn High School in Coggon

Erin Sears

Neal Smith National Wildlife Refuge

Prairie City, IA



Erin worked with the Visitor Services department where she helped refine curriculum and develop new outreach materials aligned with field trips at the refuge. Erin learned about animal and plant life in tallgrass prairie, oak savanna, and sedge meadow ecosystems. Erin plans to use the knowledge she has gained from working at the refuge to help her students learn more about their school prairie. She wants her students to become stewards of and advocates for the preservation of the prairie as an important part of Iowa's past and future.



"I think that teachers sometimes get bogged down with curricular demands, that we forget that [21st Century] skills can and should be consistently modeled and taught in the elementary classroom. Moreover, students need authentic ways to put these skills into practice."

--Erin Sears, science teacher at Willowbrook Elementary School in Altoona

Heather Sherman

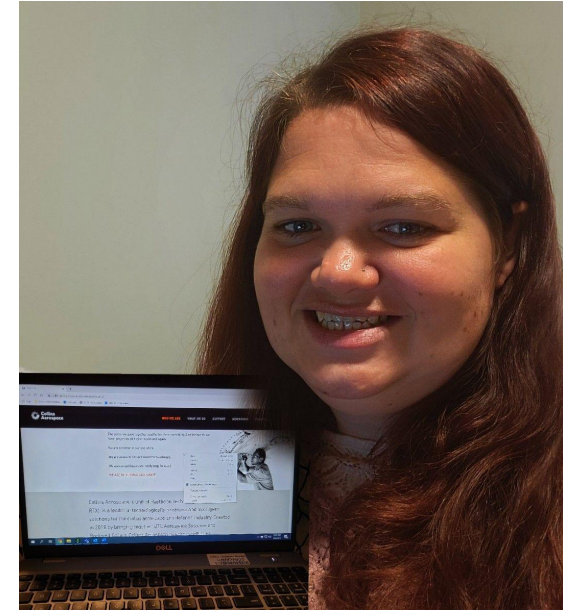
Collins Aerospace

Cedar Rapids, IA



Collins Aerospace

Heather's projects included updating wiki spaces to help with the new ticketing system for engineering tool support. This entailed attending meetings and working with software engineers and system administrators. Her main project goal was to help configure both mission systems and avionics' new Jira software tracking system to help the engineers get support in a more efficient way. She also observed how software engineers talk through processes and fix issues.



"I plan to make quite a few changes in my classroom in order to help better prepare my students for the world of work. I have always taught my students that these 21st Century Skills are important, but now I have some more actual work experience that I can use to showcase even more to them how important they are."

--Heather Sherman, business & computer science teacher at South Hardin High School

Stacey Sigwarth

Mississippi River Museum and Aquarium

Dubuque, IA



Stacey has been assisting the River Museum's education department in developing lessons that connect classroom learning with the information (and animals!) the Museum has to offer. Their educational programs are shared with local schools, libraries, and other agencies throughout the area while also providing distance learning via Zoom to groups from anywhere! Stacey will also be working in the new MakerSpace housed within the Rivers of Innovation exhibit to facilitate STEM activities with museum guests.



"Although science and history are the two main subjects that come to mind when you think of a museum/aquarium, there is math happening behind the scenes-- and probably even more than I am noticing now! I've observed them calculating and portioning the amount of food an animal or tank needs to receive, collecting and analyzing levels in tank water, and considering the cost and budget of a program and supplies. "

--Stacey Sigwarth, math teacher at Eleanor Roosevelt Middle School in Dubuque

Steve Skinner

Barilla

Ames, IA

Steve worked with Barilla's Quality Assurance Team where his main jobs centered around data input and analysis as he worked to improve various reports collected and used by the QA team. He also created and updated maps/diagrams used to identify and locate various items throughout the plant that are routinely inspected. Steve learned many things beyond just pasta and made many real-world connections that can be applied within his math classroom.



"One practical aspect that I think would carry over to my math classes is to focus more on students being able to understand the processes of others better. So many of the reports we run and share need to be understood easily by others on different teams throughout the plant."

--Steve Skinner, math teacher at Summit Middle School in Johnston

Karla St. John

Iowa PBS

Johnston, IA



Karla worked with the Education team on the Iowa Science Phenomena website (<https://phenomena.iowapbs.org/>).

Her main jobs were to develop and complete new phenomena for the site, review Iowa PBS video footage for possible new phenomena, and review and critique existing phenomena. Karla learned many new things about website development and television production, plus she developed many ideas to make her classroom more real-world and authentic.



“Another skill that I think is so important in the workplace is being able to learn quickly and efficiently and if you don’t understand something, you need to speak up and ask questions. I specifically bring this up because of how much reading and ‘talking at you’ happens in the first one to two days on a new job and how steep that initial learning curve is for a new employee.”

--Karla St. John, science teacher at Prairie View School in Waukee

Jacob Swift

Kemin

Des Moines, IA

Jacob worked with the Specialty Crop Improvement (SCI) team, which breeds, selects, grows, harvests and extracts plants, used by Kemin as raw materials. He worked with the phytochemical extraction team to chemically analyze plant samples with different genetic backgrounds. His duties included running the chemical tests and analyzing the data. He also learned about available careers and skills employers are looking for from scientists in the private sector, and laboratory processes he can take back to use with students in his classroom.



"Kemin does an excellent job of making their extern feel included and allowing them to work independently on projects which make them feel they are contributing to the success of the team. They also usually have a lot of work which needs to be done, so externs can feel productive every day. My favorite parts of the externship was the people I worked with and the diversity of tasks I was assigned to work on. "

--Jacob Swift, science teacher at North High School in Des Moines

Matthew Switzer

UNI Tallgrass Prairie Center

Cedar Falls, IA



Tallgrass Prairie
CENTER

UNIVERSITY OF NORTHERN IOWA

www.tallgrassprairiecenter.org

Matthew's externship role included assisting the head botanist in maintaining prairie planting plots, daily field weeding and watering, collecting seed samples, and assisting with other management of the prairie plantings. Matthew learned a great deal about not only the botanical and genetic intricacies of native prairie plants, but also the management of working with government programs, schools, nonprofits and grant programs.



"I think this is so important for elementary students- to understand that we WILL fail, but how we can use that to propel us towards a success. Also, I know that students that feel safe in a learning environment are more apt to share their thinking- similar to what we were doing in the field- and by sharing, we can generate new ideas."

--Matt Switzer, teacher at Aldrich Elementary in Cedar Falls

Chelsea Thordarson

City of Des Moines Public Works,

Forestry Department

Des Moines, IA



Chelsea's externship involved collecting and recording up-to-date data of tree placement, species, growth, etc. This data will be used to plan and implement any new tree purchases. She planted and cared for young trees throughout the city, which is trying to plant various "tiny trees" for people to care for, mature and relocate when they are ready. She was able to tour various tree nurseries that use gravel beds to grow and mature trees.



"I plan on using what I have learned by having [students] take a more active approach maintaining to our school grounds. We are going to monitor growth and conditions. We may even take a field trip to use what I've learned so they can take this information and skills with them into adulthood; Either as a career or in developing an ecologically friendly yardscape for themselves."

--Chelsea Thordarson, science teacher at Melcher-Dallas CSD

Ayn Thoreson

GKN

Armstrong, IA

Ayn worked with GKN's Human Resources department this summer, translating onboarding and training documents and signage to accommodate new hires who speak Spanish with the end goal of improving communication, job success and retention. She is also creating a plan for conducting tours of the facility that targets students and includes hands-on activities to help create interest and awareness of jobs available in a manufacturing facility.



"My favorite aspect of my externship was working on an initiative/project in a real-world business where it will have a real impact, just like the students in my No Boundaries program. I had to organize, synthesize, problem solve, and use all of the other skills necessary to successfully complete a project. By going through these steps in a similar way that my students do, I will be better prepared to coach them along in their projects this fall."

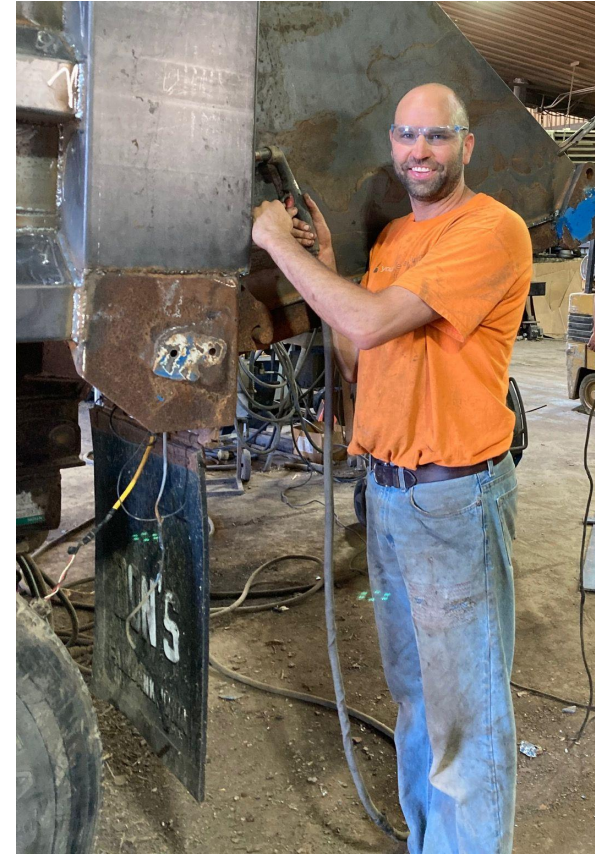
--Ayn Thoreson, spanish & No Boundaries teacher at Spencer High School

Jason Walter

The Iron Shop

Exira, IA

For his Externship, Jason was been in charge of working with customers to ensure their needs are being met and directing them to the proper channels as needed. Jason familiarized himself with many pieces of equipment including the press break, sheer, iron worker, plasma cutter, tire machine, welder and cutting torch. He completed fabrication projects, focusing on solving customer problems. He has really enjoyed understanding the balance between quality and productivity.



"I experienced not knowing and not understanding things like many of my students probably do in my classroom. That's very humbling and I think it was something very valuable to experience as a teacher... I am usually expected to be the expert and to usually know best, so it was nice to have the perspective of a learner again."

--Jason Walter, industrial technology teacher at Audubon Community Schools

Kristen Westphaling

Vectronic Aerospace

Coralville, IA



Vectronic Aerospace is a company that specializes in wildlife monitoring and space applications. The US branch focuses on wildlife monitoring projects by providing customers with GPS tracking collars for wildlife. During her time at Vectronic Aerospace, Kristen worked testing new software applications, creating documents to assist customers with R packages for data analysis, patent searches for GPS/Wildlife tracking equipment, and more.



"I think exposing students to these businesses is the greatest way to get them engaged in the real world. Many students do not know what is out in the real-world, and inviting them to learn about local workplaces is a great way to bridge the gap."

--Kristen Westphaling, math teacher at West Branch High School

Heather Wiley

QC Metallurgical Lab

Davenport, IA

Heather worked as an analytical chemist, where she was trained to analyze samples for various components including ions and heavy metals. She utilized a spectrophotometer, an infrared analyzer, an atomic absorption spectrometer, an atomic emission spectrometer, a combustibility analyzer, a scanning electron microscope, and selective ion probes throughout her externship.



"I was challenged and liked being able to ask questions of real world scientists in terms of what content knowledge they use on a daily basis and what skills they would have liked to have more exposure to during their education to prepare them for their careers. My biggest take away from the whole experience is that problem solving is key. Providing students with problems and encouraging them to attack them collaboratively by using their knowledge to help them work through it methodically mimics real world experiences."

--Heather Wiley, science teacher at Bettendorf High School

Eric Yerington

Muscatine County Conservation

Muscatine, IA



Eric assisted with various nature camps for all ages from 18 months to 8th grade. Topics included fishing, trees, reptiles and amphibians and more. In addition, Eric helped with projects that needed done at the Muscatine Nature Discovery Center such as clearing the creek for the nature camps, exercising animals, collecting monarch eggs and more. Finally, Eric also helped the naturalists update some of their curriculum and aligning it with Next Generation Science Standards.



"I think now that I know everything that they have here at the Nature Center and all the topics they can talk about I'll be letting people at my school know to call them more and I myself will call them more. I also think they can try to expand on the topics they offer to reach older students which is one thing I will trying to assist them with before I finish my time here!"

--Eric Yerington, science teacher at McKinley Elementary School in Muscatine

Hajdi Zulic

MidAmerican Energy

Adel, IA

Hajdi's externship project focused on developing an interactive tour of the facility that's geared towards high school students interested in skilled trades careers. She spent significant time working with the Training and Development team to create authentic experiences and engaging activities for students. Additionally, Hajdi worked on promoting the facility tour by designing supplemental marketing materials for high school teachers and counselors, as well as informational resources for students.



"I appreciated the fact that MidAmerican had a clear vision of what they wanted and allowed me the freedom to create that vision. I also really loved the fact that I learned SO MUCH about apprenticeships and energy in general, that I feel more confident about being able to relate to my students better."

--Hajdi Zulic, business teacher at Johnston High School