

STEM

MAGAZINE



2021-22

The Dayton Regional

S T E M

School

SUPERINTENDENT'S MESSAGE

The theme for this year was “Reboot. Realign. Reimagine”. These three words demonstrate our commitment to move forward in an intentional way and address the challenges that our school community has faced over the past two years.

Reboot refers to restarting and refocusing on our core mission to prepare and inspire the next generation of leaders and innovators. This mission will be accomplished through authentic learning opportunities marked by strong connections with our community partners.

Realign reminds our staff to enhance and tweak our practices to make sure we are meeting the needs of every learner where they are right now. Through a personalized learning focus, each student can achieve tremendous growth, both academically and personally.

Finally, Reimagine is a charge for us to never stick with the status quo, but to push ourselves to be more innovative, more relevant, more aware, and more compassionate.

As always, we seek to instill in our students the skills and competencies that will prepare them for the careers of the future. In addition, the STEM students will be caring and compassionate citizens that seek to solve the most complicated problems.



In this magazine, you will see examples of inspiring projects and initiatives, and these are only a small sampling of the amazing things the students and staff are capable of accomplishing each year. I am so proud of this school community. I hope that you will enjoy reading and will be proud and inspired too!

A handwritten signature in black ink that reads "Robin Fisher".

Dr. Robin Fisher

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STEM's new and cutting-edge learning laboratory is bringing learning to life! Read more about the inspiration for CAMP, curriculum spanning grades 6-12, and the real-world connections being made to in-demand STEM careers!



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2021-22



IN THE CLASSROOM

In **SCIENCE** class, 7th grade students used a laser cutter to make acrylic models of atoms. Students were assigned a chemical reaction to model and explain. Final models were donated to other schools as teaching tools in their classrooms.

Freshmen in **LANGUAGE ARTS** class worked to turn information about a hypothetical crime into a mock trial case.

Ms. Murakami is supporting students as they code video games in 6th grade **STEM EXPLORATIONS**.

Juniors participated in the Ohio STEM Learning Network's annual design challenge, reimagining existing systems or services to make them more equitable, accessible, or efficient. Through the cross-curricular project between **GOVERNMENT, MATH,** and **TECHNICAL READING & WRITING** classes, students researched topics like food insecurity, the tax system, or healthcare, analyzed data using different mathematical models, chose a system to improve, and learned how to professionally communicate their plans to a larger audience.

Ms. Sauder facilitated debates with her upperclassmen about genetic engineering and environmental ethics issues in **ENVIRONMENTAL ENGINEERING**.

GAME DESIGN's 11th and 12th grade students worked with new group members to learn and present four 3D modeling software: Blender, Maya, 3ds Max, and SketchUp. The goal was to diversify skill sets to make students competitive in the job market.

9th grade **ENGINEERING SCIENCE** students designed puzzle cubes using Computer Aided Design (CAD) and 3D printed stands in CAMP Dossier to display their work.

Middle school students created informational products in **STEM FOUNDATIONS** courses for Cybersecurity Month to share with the community.

Teams of 8th grade students in **SCIENCE** class were challenged to build a soap box derby car to answer their driving question, "How can we use our knowledge of Newton's 3 Laws to design a car that will win a race?"

In **SOCIAL STUDIES** class, 6th graders worked in teams to create their own companies and produce a product to be sold at Exhibition Night during the Economics Project.

To answer the question, "Do fixed and growth mindsets about learning mathematics exist in other cultures?" Ms. Chen's students introduced Dr. Schaefer's **MODELING & REASONING** students to their pen pals in Taiwan. All students recorded and responded to videos about their experiences with fixed and growth mindsets, and Dr. Schaefer's students used these responses to inform their answers.

Students in 10th grade **CCP CHINESE 2** learned a traditional form of the Tai Chi exercise, as well as a song embodying relationships between parents and children, and performed live at Exhibition Night.

Students in 7th grade completed a cross-curricular project between **SCIENCE, ENGINEERING,** and **LANGUAGE ARTS** classes, to create trading cards showcasing STEM professionals' struggles and accomplishments, alongside a 3D printed token representing their STEM field.

During the Skin Color Project, which spanned four classes: **LANGUAGE ARTS, MATH, SCIENCE,** and **US HISTORY**, 8th graders explored genetics, historical events, current data, and modern literature to construct an answer to the driving question, "How & why does skin color matter?"

ANATOMY & PHYSIOLOGY students worked to create a visual representation of the muscles of the face and neck, and built working models displaying the sliding filament theory as well as skeletal muscle expansion and contraction.

Combining **MATH** and **DIGITAL EXPLORATION**, 7th graders showed their understanding of scaling shapes by coding in Python, and exploring its coding platform.

Mr. Pant's 9th graders collaborated to develop scripts, create storyboards, act in costume, film, and edit Silent Films as part of their **AMERICAN HISTORY** project, set in the Industrialization and Progressive Era.

Ms. Williams and Ms. Lydy's 7th graders explored the science of wind energy in **SCIENCE** and **ENGINEERING EXPLORATION** classes. They designed and tested turbine blades in the KidWind Design Challenge through the Ohio Energy Project.

After learning about careers in the **GAME DESIGN** industry, 10th graders researched and developed video game pitches that they presented to peers and partners. The audience acted as publishers and voted on which development team they would invest in based on the kick-start proposal.

Students in 6th grade used the engineering design process and Tinkercad to create lanterns that represent themselves, while learning about the science behind light in this cross-curricular project for **STEM EXPLORATIONS** and **SCIENCE** classes.



STEM POINTS OF PRIDE



2019 NATIONAL BLUE RIBBON SCHOOL

- SCIENCE • TECHNOLOGY •
- ENGINEERING • MATHEMATICS •



125 NEW INNOVATORS in the Class of 2029

100% GRADUATION RATE
Class of 2022

OVER 100 REAL-WORLD PROJECTS designed by innovative faculty each year

3 STEM CAREER PATHWAYS

Healthcare

Computer Science

Engineering

DO STEM
PROUD PARTNER
Dayton Ohio STEM Ecosystem

6 STEM FOUNDATIONS COURSES for middle school students



70% OF GRADUATES PURSUE A STEM FIELD
National average approx. 25%



670 EDUCATORS SERVED THROUGH TRAINING CENTER

STEM HUB HOSTED ON-LOCATION in partnership with the Ohio STEM Learning Network

639 GRADUATES since 2009

COMMITTED TO MILITARY FAMILIES
BUILDING A STRONG FUTURE WORKFORCE FOR
DAYTON





Where Have All the Oak Trees Gone?

For 23-million years, the majestic oak tree has stood strong and tall across the Northern Hemisphere. Identified by its round lobbed leaves, thick trunk, and acorns, it is the most widely spread tree in the world. Oak has been used to build the homes of our earliest ancestors and create the oak gall ink used to sign some of the most important documents in history, including the Magna Carta, Mozart's music, and Newton's theories. As our nation's national tree, the oak symbolizes wisdom, strength, and endurance. But, did you know that oak trees are not regenerating in the Allegheny Plateau? This leaves a huge ecological and economic impact. This fall, science teacher, Emily Carter, led her sixth graders on a quest to investigate the driving question, "Where have all the oak trees gone?"

>>>

Carter, who has taught sixth grade Science for four years, knew it was time to refresh her biology unit when she learned that the investigation topic she used in past years – the declining trout population in the Great Lakes – had recently been solved by researchers. Eager to design an authentic project for her students, Carter teamed up with Wright State University biologist, Dr. Megan Rua. For the October project kick-off, they challenged students to support local researchers in tackling a new issue at hand: the disappearance of oak trees here and around the world. The storyline for the project was inspired by Dr. Rua's studies on the impact of mycorrhiza on oak trees in the Allegheny plateau.

Students began their project by studying ecosystems. The Allegheny Plateau is the western section of the Appalachian Mountains covering parts of New York, Pennsylvania, West Virginia, and eastern Ohio. This large flat landform is raised, covered in forests, and surrounded by steep sides of mountains. Students zoned in on the Hocking Hills area for their research, which is about 100 miles from the STEM School. They considered any biotic or abiotic factors that could be impacting the area. Carter led several ecosystem simulations to explore how limiting factors may impact the oak trees.

Next, students explored symbiotic relationships happening in the Allegheny Plateau, including mutualism, commensalism, parasitism, predation, and competition. One mutualistic relationship found was that between Mycorrhiza fungi and oak trees. Mycorrhiza fungi live on or in the root of the oak, extending beyond the root to collect nutrients and water for both themselves and the tree. Because oaks need Mycorrhiza to live, students learned that the fungus is a vital link in the tree's nutrient cycle. Thus, they began to focus on whether an absence of fungi could be contributing to the disappearance of trees. With the help of Dr. Rua, students studied this relationship by planting, caring for, and collecting data on different seedlings. Dr. Amanda Duselis from Sinclair College (and proud STEM parent) taught the sixth graders to use a microscope, practicing with fruit fly slides. Students then put their skills



to the test as they viewed Mycorrhiza on their own under the microscope.

For the culmination of this science project, Carter teamed up with Dr. Todd Hutchinson, a research ecologist from the United States Department of Agriculture, to plan a field trip to Vinton Furnace State Forest. According to the Ohio Department of Natural Resources, this forest is one of the nation's most biologically diverse ecosystems and has been a key site for research on oak tree restoration and other topics for over 50 years.

"The goal for this field trip was for students to see the Allegheny Plateau in person," said Carter. "I wanted them to be able to touch the oak trees and connect with what they learned in class. This was also a great opportunity to expose them to a variety of biology and ecology careers."

On a cold day in November, 125 sixth graders made the 112-mile bus ride to the forest, where they were greeted by a team of professional researchers ready to bring their learning to life. Dr. Hutchinson arranged a series of stations for students to explore.

The scientists-in-training explored the forest and its history on a hayride tour, studied acorns and mast, identified tree species, measured tree rings, examined wildlife samples, and were wowed by photos from the Eagle Cam. Representatives from Ohio University, Forest Services, Vinton County, The Ohio State University, the Ohio Department of Natural Resources, and Hocking's Natural Resources Conservation Services facilitated an incredible day of exploration and real-world learning that the students will not soon forget.

"Ms. Carter's Oak Tree project was an overall amazing learning experience for our sixth grade students," said Middle School Principal, Andrew Sears. "Her ability to bring a real world, local problem into the classroom to make the learning and research authentic is what I love about project-based learning. The connections to researchers, both in the classroom and at Vinton Furnace made it that much more impactful and meaningful. I was lucky enough to attend the trip to the research facility, which was easily one of the most informational and engaging trips I've been a part of at STEM. It takes a lot of time, knowledge, and energy to foster this type of project. Kudos to Ms. Carter for facilitating this amazing PBL experience with our youngest Innovators!"

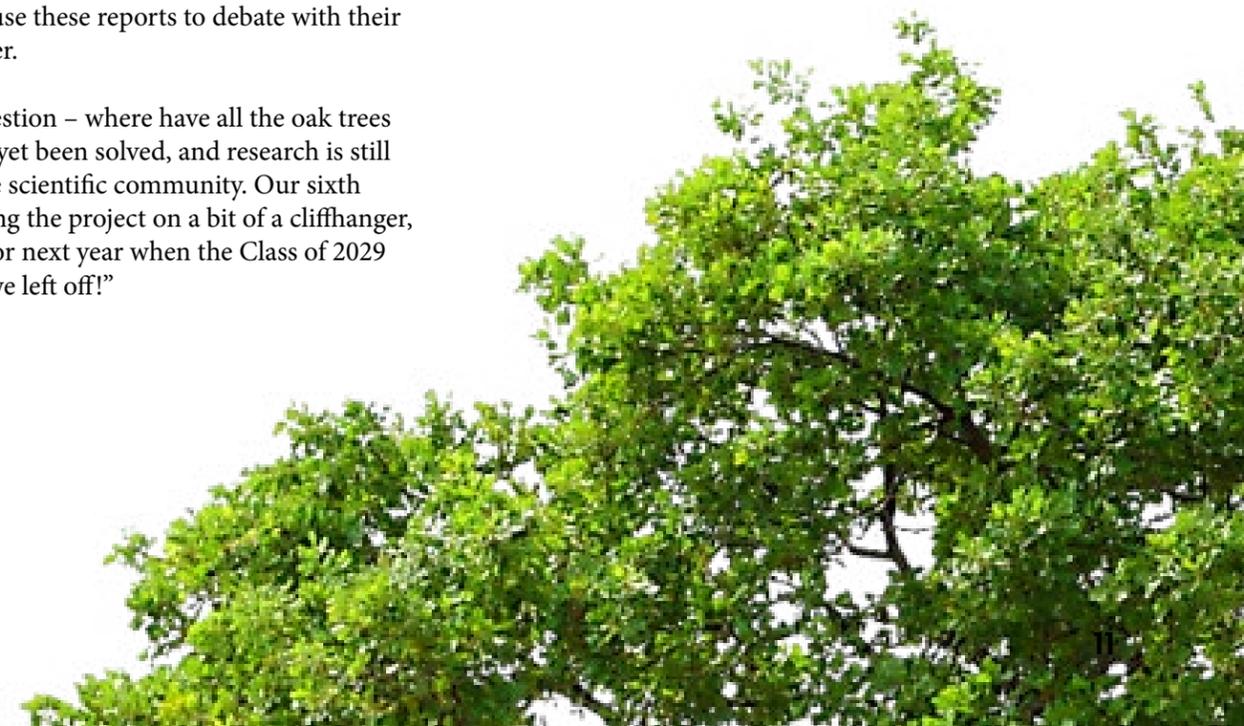
True to her character, Ms. Carter is already brainstorming how to take this project to the next level. "I'd like to have the students explore photosynthesis, particularly at the cellular level. I'm also planning for students to write an age-appropriate lab report with their hypothesis on why the oak trees are not regenerating, complete with a claim, evidence, and reasoning. They could use these reports to debate with their peers," said Carter.

"Our driving question – where have all the oak trees gone? -- has not yet been solved, and research is still very active in the scientific community. Our sixth graders are leaving the project on a bit of a cliffhanger, but I'm excited for next year when the Class of 2029 picks up where we left off!"



CONGRATULATIONS!

We are excited to share with our STEM community that Ms. Emilly Carter has been named the 2022 Arthur S. Holden Ohio Science Teacher of the Year by the Martha Holden Jennings Foundation. Congrats, Mrs. Carter!



The Art of LIGHT

Students in Jenny Montgomery's Architecture course were invited to design and create an illuminated, inflatable installation for the local Illuminate Springfield Festival of Light. The structure had to be site-specific and exemplify one or more architectural design principles in response to the site. Read on to see how STEM students tackled this exciting project.

INSPIRATION

To kick off the project, students visited Frank Lloyd Wright's Westcott House in Springfield, Ohio. During a tour with Executive Director and Curator, Marta Wojcik, students photographed the house and gardens while looking for examples of the use of design elements and principles. Following their visit to the Westcott House, students visited two potential locations for proposed installations in downtown Springfield. Scott James of The Now Device and curator of Illuminate Springfield facilitated a site analysis with the students.

DESIGN

Working in small groups, students chose their preferred site to design and created site maps. The plan view drawings detailed site measurements, directional orientation, physical features, entry and exit points, circulation, and view sheds. Next, students created sketchbook drawings, clay sketches, and plan view concept sketches. James joined the class again to lead an all-day workshop wherein students critiqued the concepts and began prototyping the ideas they felt met the program goals the best.

EXECUTION

Based on the designs and prototypes, students worked with the Illuminate Springfield festival committee to determine that the "Mother Cloud" concept best fit the program goals. Mother Cloud was designed by Mads Caskey, with the idea of contrasting the soft organic form with the symmetry and geometry of the modernist architecture found at the Springfield City Hall building and plaza.

The final piece was made by cutting and sewing vinyl into the shape of a cloud, which was then inflated and illuminated with colored lights that faded into each other. The largest cloud was accompanied by two baby clouds, whose colors responded to sound. Assisting artist, Brooke Bryan, was instrumental in helping students create a gusset for Mother Cloud and lent her specialized sewing skills and machines to help make Mother Cloud come to life.

EXHIBITION

Students proudly shared their installation at the Dayton Regional STEM School's Winter Exhibition Night in early December. The next weekend, Mother Cloud illuminated the Springfield City Hall courtyard at the Illuminate Springfield Festival of Light and was enjoyed by family, friends, and the community.



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1. Site visit to Frank Lloyd Wright's Westcott House
2. Students present site analysis and designs to peers for critique
3. Final installation at Illuminate Springfield Festival of Light
4. Site visit to Springfield City Hall
5. Student site analysis
6. Students working together on Mother Cloud

Authenticity & PBL

“The Real World Starts Here.” Our school’s slogan exemplifies the Essential Project Design Element of Authenticity. Authentic projects are real—they are meaningful to students’ lives, they impact or are used in the real world, or they meet a need beyond the classroom. Authenticity inspires students at STEM to harness their learning for a real purpose. Here are several projects at STEM that address the four types of authenticity.

1. The project meets a real need in the world beyond the classroom, or the products that students create are used by real people.

In sixth grade, one of the students’ first experiences with project-based learning is the famous Economics Project. Students have worked in teams to create a company and a product to sell at our Winter Exhibition Night, with the goal of maximizing profit to donate to a local charity. Products have ranged from cookie and brownie recipes in a jar to holiday ornaments. Not only did students need to scale a recipe to purchase an accurate number of ingredients, but they also needed to price their goods to make money! Students sold their wares in a bustling cafeteria, where cheers erupted whenever a business “sold out” of their products.



2. The project focuses on a problem, issue, or topic that is relevant to students’ lives, or on a problem or issue that is actually being faced by adults in the world students will soon enter.

In the spring of their freshman year, Mr. Bottelier issues this challenge to students: Design a product that can be 3D printed to solve a problem in your life or the life of someone you know. Applying their CAD knowledge, students brainstorm, pitch, critique, design, test-print, and then finalize their designs.

So many innovative solutions have emerged from this project. For example, Tayla’s cat has learned to open the bird cage doors at her house, so she created a clip that can double as a bag clip as well. Alex noticed that it was difficult to get the last of the laundry detergent out of the bottle, so he designed a stand to hold the bottle upside down. Elise has rimless glasses that scratch easily when resting on a table, so she designed a holder that could also store her mini-screwdriver and two rings that she wears. This project allows students to not only hone their engineering science skills but also create a product to meet a real need that they have identified.

3. The project sets up a scenario or simulation that is realistic, even if it is fictitious.

Inspired a few years ago by the installation of the Cincinnati SkyStar Ferris Wheel, students in Dr. Nancy Schaefer’s Precalculus course research a potential location for a ferris wheel in the Dayton region. They create a proposal for its location, design a scale model, and use mathematics to describe a rider’s experience on their ferris wheel.

Some students design their models out of cardboard, others out of CAD-designed 3D printed parts, and some even design virtual models using the Unreal Engine platform. Creating ferris wheel models that bring concepts like the sine curve to life help students grasp concepts that otherwise might feel like just numbers on paper. In addition, the students enjoy researching local sites for their ferris wheels, such as Carillion Park, RiverScape MetroPark, and even a child-sized version at STEM’s North Field.

In Ms. Jackie Harris’s ninth grade Language Arts class, students participate in a NASA simulation to hone their communication skills. Students are grouped into crews, and these crews participate in a variety of exercises, including research on astronaut training... before writing a fictitious story about their crew experiencing the events they have researched.



4. The project involves tools, tasks, standards or processes used by adults in real settings and by professionals in the workplace.

No matter what authentic product our students at STEM create, every one of them meets this characteristic of authenticity.

For example, during the Economics Project, students complete several tasks that any new business or entrepreneur would take on, such as selecting a name, a company slogan, and creating a product to meet a consumer need.

Engineering Science ninth graders use the Autodesk Inventor software to create their solutions, which is used in multiple industries for creating 3D mechanical designs. In addition, students utilize the Engineering Design Process to determine, create, test, and refine their prototypes so that their final designs can be 3D printed.

For the Ferris Wheel project, the students choose from a variety of tools to create functional Ferris Wheel models, from carpentry tools to AutoDesk Inventor to Real Engine modeling and simulation software. With the advice of local business and engineering experts, students consider locations for their Ferris Wheels that will positively impact the region.

In ninth grade Language Arts, working on a simulated NASA crew involves many important tasks and skills, such as research, communication, and collaboration. Additionally, the students work to publish their stories in an online e-book, which requires that they polish their writing just like authors in the real world.

Using these professional tools to craft their final products instills a sense of pride in STEM students. When their work matters to others, our students find meaning in their learning and begin to imagine the future impact they will have on our world.

by **Jenn Reid**
PBL Coach





5 Ways to Be a Critical Friend

BY NORA MEEK, '25

During my time at the Dayton Regional STEM School, I have learned how to give critical feedback in a helpful and meaningful way. I have experienced ways to tell my peers what I thought they have done well, what they might have missed, my first impression of their work, and what suggestions might help them improve their work. Learning to give and receive critique has helped me so much! Having helpful and kind feedback has allowed me to do great work on projects and connect with my peers. I started to learn about the Thinking Hats and how to be a critical friend as soon as I walked in the door in 6th grade. STEM is truly getting students ready for the real world.

HERE ARE SOME TIPS TO HELP ANYONE BE A CRITICAL FRIEND!

1. What is it for? It is always good to know what a work's purpose is before you dive in, so, you have an idea of what you should be looking for. If it's a project, you can look at the rubric. If there isn't a rubric, make a list of items that might be good to have, cover, or explain. For written pieces, think about what needs to be written. For artwork, think about the mood and originality. Consider the things that might be overlooked by others. The subject trusts you to give them kind, helpful, and meaningful feedback, so make it count!

2. Look Thoroughly The first time you look at something, your brain often doesn't process it completely. This is why it is very helpful to take a second or even third look before you begin giving feedback. As you look through, write

notes about what you have seen, noticed, liked, and thought could be improved upon. This makes it easy when you want to look back at something while you are giving feedback.

3. Use The Hats The Thinking Hats, which we learn about at the STEM School, allow you to give feedback in a way that is useful and kind. Each hat is a different color and represents a statement you should share while critiquing someone's work.

4. Look Once More Look over the work one more time to see if there is anything else you want to add, change, or say. It's okay if you don't change or add anything. That just means that you're a critique pro already!

5. Imagine Receiving Your Feedback Read through your feedback. Imagine yourself receiving this from someone else. How would you feel? Make sure everything you share is helpful, meaningful, and kind. During a past project, two different friends gave me feedback separately. As I was reviewing the two critiques, I felt myself getting worked up over one. They used the word "should" and were not very kind. The other critique was nice, gave suggestions, and acknowledged how hard I worked on the project. I found myself wanting to do more of the suggestions given by this friend, even though they were both saying similar things. I try to remember this every time I'm providing feedback!

GIVING AND RECEIVING FEEDBACK CAN BE TOUGH, BUT YOU'VE GOT THIS! I KNOW THAT IF YOU USE THESE TIPS I LEARNED AT STEM, YOU'LL BE A GREAT CRITICAL FRIEND!



RED HAT is what you first notice about the work. What stood out to you about the work? You could say something like, "When I first saw this, I felt ___" or "When I first looked at your work I noticed ___".

YELLOW HAT is something that you liked or something they did well on. It is okay to tell them what they did well, so they won't change the parts that are strong. You could say "I see you are meeting the goal of ___ because I see ___", "It was clever how you ___", or "I loved how ___ turned out".

BLUE HAT is something they might have missed. Make sure you are not saying that their work is bad. You could say "I see you're not meeting the goal of ___ because I see / don't see ___" or you could say "___ seems different from everything else because ___".

GREEN HAT is suggestions that they might consider to make their work even better. When using green hat, or any hat, I would recommend that you don't use the word should, it sounds demanding and like they have to change something. Instead you could use "maybe try ___", "what if ___", "have you considered ___". Remember to be specific!

What are the Thinking Hats?



SCIENCE



EDUCATOR BY DAY...

CAKE BOSS BY NIGHT

Andrew Sears, Middle School Principal

This will be my seventh year at the Dayton Regional STEM School, and I've loved every second! What you may not know is that baking and decorating cakes is



one of my favorite hobbies when I'm not overly busy at work or running my three kids around. This is a relatively new hobby that I stumbled upon a few years ago

when I volunteered to make pies for Thanksgiving dinner. I found the combination of precision and creativity to be a lot of fun with a (hopefully) great-tasting result. More recently, I've started to explore the art of decorating cakes, which adds a whole new level of creativity and challenge. As you can see from the picture, I still have a long way to go with this part. I look forward to you all sharing baking tips and your favorite dessert recipes next time you see me!

BASKETBALL STAR BY NIGHT

Bridgett Williams, Engineering Teacher

One little known fact about me is that I played college basketball, participated in the Olympic Sports Festival, and coached NCAA Women's Basketball for 20 years. I also created my own AAU basketball program for athletes to travel the country playing in front of college basketball to receive an athletic scholarship.

I stepped away from college coaching in 2010 to raise a family. I will still coach private lessons on occasion. Basketball has always been such a fun and rewarding part of my life.



NATIONAL PARK EXPLORER BY NIGHT

Jade McDaniel, Language Arts Teacher

The Christmas before our daughter, Beatrice, was born, my husband and I were visiting family in Pigeon Forge. We stayed in a hotel right at the entrance to the Great Smoky Mountain National Park. One morning, we decided to hike a trail along the Little Pigeon River. Neither of us had ever really given much thought to exploring parks, but this would quickly become an important part of our family.

On my husband's first Father's Day – and like good Daytonians – the three of us visited the Wright Brothers National Memorial. As we were leaving, we purchased a National Park Passport on a whim and added our first stamp. Visiting nearby Cape Hatteras National Seashore and Fort Raleigh, we added two more during that same trip. Since purchasing that small blue notebook, we've been visiting parks, collecting stamps, and making memories as a family ever since. Bea is now five years old, and we've explored over 15 different National Park sites together.



When I flip through our passport and see all the stamps in multi-colored ink, I'm reminded of so many memories: another hike in the Smokies when Bea was a year and a half and wanted to walk the entire trail herself up to Grotto Falls instead of riding in her carrier; the summer when she was two and we visited the sites along the Dayton Aviation Trail to get a little "Wilbear Wright" teddy bear; a trip to Indiana Dunes, when kidney stones and a trip to the emergency room could not even ruin our visit; and our most recent trip over spring break to the newest national park, the beautiful New River Gorge in West Virginia.

While our first visit to a national park was unplanned, it's become a tradition to plan our vacations around the parks. For our next trip we'll be exploring Harper's Ferry, Gettysburg, Shenandoah, and several sites in Washington, D.C.. I'm looking forward to continuing this family tradition, making many more memories together in the great outdoors, and adding more stamps to our little blue notebook.

DO STEM

NOVEMBER 3, 2022

FUTURE FAIR

OPEN TO 5TH-12TH GRADE
STUDENTS AND FAMILIES

LEARN MORE AT [DO-STEM.ORG](https://do-stem.org)



BY RHYS WINBURN, '23



LET'S TALK ABOUT R.A.C.E.

Over the past few years, students and staff have come together to work on a series of diversity initiatives at the Dayton Regional STEM School. In the summer of 2020, the Racial Alliance Collaborative Effort, or RACE Club, was born. Junior, Rhys Winburn is here to share his experience with this meaningful initiative.

The purpose of RACE Club is to help create a safe environment at STEM where BIPOC (Black, Indigenous, and People of Color) students can have representation, express their feelings, and discuss hard issues. We also want to create allyship within the student body. We do this by creating school events where students can learn more about race and diversity.

The club is facilitated by students and supported by staff. My role in the group is a board member, which means that I am part of a group of high school students in RACE Club that provides structure and curriculum for the club. We come together bi-weekly to discuss what topics we want to cover in our larger club meetings or future events that we are hosting at the school. One special thing about RACE Club is there is no president, meaning the board members are making decisions together. This really helps to create a family-like environment in the club. Staff members are there to help us execute things that are out of our reach, which helps us learn what is logistically possible for our initiatives and all the moving parts in our school.

This year, our RACE Club board worked to plan student panels for each grade level at the STEM School. During these panels, we had conversations about race and diversity, which created an opportunity for students to ask questions about topics they don't understand. This was our first time hosting an education session for not just peers in high school, but also middle school students. This was very exciting because we have future plans for RACE Club to spread to middle school.

One meaningful moment from RACE Club that stands out to me is our first club meeting this school year. Because of the pandemic, I was unable to attend meetings last year. I was really excited to physically be in a meeting and hear stories face-to-face. This meeting in particular was also special because of how emotional it was. We all started to open up about our own personal struggles and what issues we face on a daily basis. Usually, discussion meetings are very calming and filled with laughter, but this first meeting

was filled with sad and happy tears. Because of RACE Club's strong family environment, everybody was able to truly relate to the ups and downs of each other's struggles. I wouldn't consider myself a crier, but I definitely shed a tear during this meeting.

When thinking about the Five STEM Qualities, I would have to say Communication and Inquiry are used the most in RACE Club. We are always communicating about our personal journeys and experiences of our life. We also include Inquiry in our club meetings because we encourage each other to listen and ask questions when we don't understand something. I think one of the main issues I have seen over the years when talking about race is the inability to listen. Sometimes, we want to find an answer to everything, especially when it's a topic as complex as race. However, sometimes the best thing you can do is listen and take in someone else's experiences and try to learn from them. At the end of the day, that is one of the most important things you can do as a person.

I think RACE Club is important for the STEM School to have because we have improved the already great environment around race and diversity. Over these past two years, we have been able to educate and help students feel like they can make a positive change in their school regarding topics that before, felt out of reach. RACE Club is a safe, family environment where we can be open, be ourselves, and discuss important issues.

The change that we helped bring to the school by creating this beautiful environment that can help empower and liberate people has been our biggest success so far. My hope is that RACE Club will be able to grow throughout the STEM School. Right now, the club is open only to high school students. Our goal is to expand into the middle school so every single STEM student can feel the positive effects of the club. I also hope that RACE Club can be implemented in other schools. I truly do believe the work that we are doing is important and should be available to all students, everywhere.

CENTER FOR ADVANCED MANUFACTURING & PHOTONICS

Antoine Gagne uses the chain hoist to lift two glass garage doors and open the Center for Advanced Manufacturing and Photonics for the school day. It is 8:10 A.M. and STEM students are filling the halls and heading to their respective classrooms, ready to dive into their first project. Over the hustle and bustle on campus, Antoine tunes into the familiar white noise of the Center.

He can hear the hum of a 3D printer churning out a student design that will fix a broken baby gate. He can smell the fresh ink on the vinyl-printed World War II propaganda posters created in Mr. Pant's American History course. There is the quick, light clicking of a computer mouse as his classmate, Nick Heyart, edits a design file for Ms. Lydy's seventh grade molecular models, which will soon be cut from acrylic using a CO2 laser.

As he takes in his surroundings this morning, Antoine remembers the first time he ever saw a 3D printer on display while at a Battle Bots

competition with his father. As an inquisitive eighth grader, he was excited when the technology soon began to pop up wherever he went.

"Our school's FIRST Tech Challenge Robotics team started using 3D printers to build custom parts for our robots in a matter of minutes. This led to greater success at competitions. As a freshman, I began learning about computer-aided design (CAD), 3D printing, and laser cutting in my Engineering Science course. It just snowballed from there."

Over the past year, Antoine has served as one of five lab assistants in the Center, starting each day working hands-on with some of the most innovative technology found on the STEM School's campus. "It's surreal how far I have come and how much I've learned in such a short time." Little does Antoine know, these experiences have been years, even decades, in the making.

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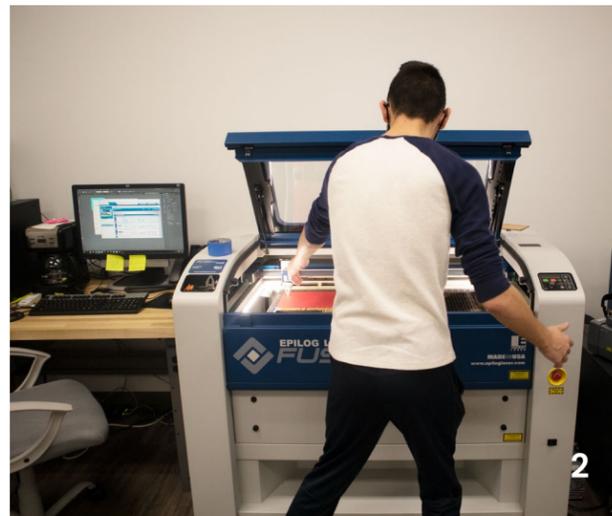
The Center for Advanced Manufacturing and Photonics is fondly known as CAMP Dosser, in tribute to industry expert and STEM advocate, Dr. Larry Dosser. The school's partnership with Dosser began when he volunteered as a business owner to participate in the search for the first principal nearly fifteen years ago. After joining the Board of Trustees, he has since engaged in continuous conversations with administrators, faculty, and community partners about addressing Dayton's critical workforce needs, particularly in the manufacturing industry.

"Our industry is in need of good technicians, engineers, and scientists who have an understanding of the fundamentals of laser material processing and additive manufacturing," said Dosser, who built Mound Laser and Photonics Center in 1995. The company, which now neighbors the school in Kettering, was acquired in 2015 by Resonetics, the leader in micro manufacturing for the life sciences industry. "Recently, the pandemic demonstrated the need to increase the manufacturing base in this country. The Dayton Regional STEM School is the ideal learning environment to introduce [these principles] and applications through project-based learning."

Through years of extensive advocacy, collaborative conversations, and personal philanthropy, the seeds that Dosser planted have blossomed into a highlight within the school and a model program for workforce development. The Center for Advanced Manufacturing and Photonics was officially created in 2019 as a high-tech and co-curricular learning lab that perfectly complements the school's Engineering Career Pathway.

CAMP fosters authentic, hands-on learning and inspires students to explore concepts and in-demand careers in manufacturing. The goal is for students to not only learn to use CAMP's collection of industry-grade equipment -- including 3D printers, CO2 laser cutters, CNC machines, vinyl printers, and more -- but also discover the science behind the machinery and connect classroom content with real-world technology.

"The Center for Advanced Manufacturing and Photonics provides the opportunity to meet so many of our educational goals," said Dr. Robin Fisher, Superintendent at the Dayton Regional STEM School. "As we strive to expose students to applied science and address workforce needs, we are also pushing students to use the five STEM qualities – Inquiry, Collaboration,



Creativity, Communication, and Persistence. No matter what future path they pursue, there is great benefit to exploring these technologies. The opportunities at CAMP align with our vision for the ideal graduate, a well-rounded innovator with a passion for learning."

"The very first project I worked on in CAMP was the birdhouse project in ninth grade," Antoine recalled. "The goal was to use CAD to engineer a birdhouse, then use the CO2 laser to cut the pieces and build out the final product. I learned that the parts came out cleaner and more precise when we used the laser. Mr. Bottelier taught us about craftsmanship and creativity in addition to the engineering design process. We learned about the sustainability of materials and working efficiently. We were challenged to add special features to our designs. We covered the entire process. I learned that your design, art, or project does not have to stay or live on the computer. CAMP can help it come to life."

CAMP is not just a physical laboratory that churns out products; it also represents an intentional and vetted curriculum with exposure for each student at the Dayton Regional STEM School. Over the past several years, teachers have worked diligently to instill CAMP principles into their lessons and projects, starting at the very beginning. In sixth grade, young Innovators learn the engineering design process, try their hand at design software and 3D printing, explore concepts of light, and celebrate National Manufacturing Day with a field trip to Production Control Units. These fundamentals build as they advance through their middle school years, learning more about lab and laser safety, design software, careers, etc.

During the last ten days of every school year, students forgo their normal class schedule and are immersed in a STEM topic of their choosing. This experience is called "STEMmersion." This year, Middle School Principal, Andrew Sears, teamed up with engineering instructor, Bridgett Williams, and math teacher, April Marini, to create a new "Laser Lab" STEMmersion course. Thirty middle school students explored CAMP Dosser through design challenges in engineering, physics, material science, and manufacturing. The group got hands-on with high-tech tools while also

learning about laboratory safety, careers, real-world applications, and more.

"This was a fantastic way to let our youngest students dive a little deeper into the study of light and have some fun along the way," said Sears. "Our teachers are doing an excellent job using additive manufacturing through 3D printing in our middle school curriculum. We are excited to use this STEMmersion course as a pilot for how to infuse the "P" of CAMP intentionally into our middle school science and engineering classes."

In high school, students amp up their CAMP exposure in Engineering Science, Physics, Engineering Design and Development, and other STEM courses. The STEM School offers an Engineering Career Pathway, which students can specialize in as they advance as upperclassmen and even earn industry-recognized credentials. Content and projects are often cross-curricular thanks to project-based learning, which means CAMP teachings extend beyond engineering and science courses. Art, material science, language arts, math, social studies, and even Chinese teachers find unique and meaningful ways to use the equipment to enhance their lessons.

CATERPILLAR FOUNDATION DONATES \$70,000 TO CAMP DOSSER

The Dayton Regional STEM School is proud to partner with the Caterpillar Foundation to support the sustainability and growth of the Center for Advanced Manufacturing and Photonics.

The mission of the Caterpillar Foundation is to build thriving communities by investing in the skills people need to join the modern workforce, and the natural and vital infrastructure they rely upon. Their special focus in creating the workforce of the 21st century, including workforce readiness and STEM education initiatives, perfectly aligns with the STEM School's goals.

In 2021, the Dayton Regional STEM School was awarded a two-year grant for \$70,000 to support

CAMP operations and initiatives, including project materials, design challenges, professional development for educators, and a Lab Manager position. This support from our local partners is key to programmatic sustainability and for our students to continue to receive a dynamic and real-world learning experience with exposure to cutting-edge technology and careers of the future.

CATERPILLAR
FOUNDATION

CATERPILLAR

STEM PARTNERS WITH AMERICA MAKES

The Dayton Regional STEM School is pleased to partner with America Makes, the nation's leading public-private partnership for additive manufacturing technology and education, to participate in the Ohio Secondary Education Additive Manufacturing Training Network during the 2021-22 school year.

The network provided formal education and training of additive manufacturing technologies to high school students and their educators to ensure the next generation of Ohio workers are equipped with the skills to fill advanced manufacturing jobs. Ten high schools statewide, including those in both urban and rural settings and representing public, charter, and career and technical schools participated in the network. This America Makes Education and Workforce Development program was created in collaboration with the Ohio Development Services Agency (OSDA) and was funded through the Fiscal Year 2020-21 State of Ohio operations budget.

“There is no question that our state and our nation are facing a significant skilled labor shortage and misalignment of skills and competencies,” said Josh Cramer, America Makes Education & Workforce Development Director. “We need to take action now with K-12 students, with immediate emphasis on focusing on secondary education students and empowering their educators to help them increase awareness of AM technologies and advanced manufacturing careers. With the creation of [this network], we are building that critically needed additive pipeline across the state of Ohio.”



America Makes

Art teacher, Jenny Montgomery shared, “In my classes, students have used CAMP Dossier technology for a variety of purposes, ranging from testing ideas and prototypes to designing and creating final products. Architecture students 3D printed scale models of buildings designed for the AIA Student Design Competition. Students in our Art and Science of Materials course experienced the manufacturing process from inception of a product through modeling and printing mold samples to mass production of cement wall tiles. Freshmen in Art are utilizing the laser to cut and etch fold lines for origami-inspired, flat-foldable furnishings and accessories compact enough to be flown on a spacecraft. Having access to this technology enables students to learn and employ the skills needed to create professional products utilizing the same technologies as industry experts.”

The learning does not stop when students leave the classroom. The Experiential Learning credit listed on their senior transcripts perfectly describes Antoine and his four classmates’ special opportunity in CAMP Dossier. Antoine, Nick, Maddie, Jack, and Joe all expressed interest and promise in related classroom content, allowing them to serve as lab assistants as upperclassmen. These students spend part of each school day with a lab manager, supporting daily operations, advising teachers and students with projects, providing lab tours, performing equipment maintenance, and working together on special initiatives.



“Experiential learning is the best way to learn when you’re passionate about something. When you are out in the real world, there are few classes to teach you cutting-edge technology because of the novelty. You just have to get in there and teach yourself. This is what we do in CAMP,” said senior, Nick Heyart. “Each student sort of ‘specializes’ in a certain type of machine; mine is the 3D printer. We are able to get hands-on with the technology, apply and practice what you know, and learn from each other.”

Strong math skills, knowledge of CAD and the engineering design process, working with hand tools, and a basic understanding of light are all important technical skills for working in CAMP. In addition, STEM students also possess professional competencies and interpersonal skills that are critical in any career, which can be demonstrated through their work in CAMP.

“As a CAMP Lab Assistant, I have learned professional skills like working with clients, communication, and collaborating with my team,” said Antoine. “We have implemented processes, such as a ticket system for project requests, to help our workflow. I really enjoyed learning about the business side of CAMP. I didn’t know engineers did that.”

Partners play a critical role in the continued success of the Center for Advanced Manufacturing and Photonics. First, the school is working to create intentional pipelines for students to continue their education in these high-need industries. STEM administrators and teachers collaborate closely with institutions like Clark State Community College and Wright State University, which are building similar programs to address our local workforce demands. By working together, we can share resources, scaffold learning, offer joint programming, leverage partnerships, and define clear path options to students after graduation from the STEM School. These pipelines are replicated in all of the school’s career pathways and STEM programs, including computer science and health science.

Our industry experts have supported the scaffolding process, acquisition of equipment, curriculum development, expertise in the classroom, and project-based learning. They also serve as mentors as students participate in required work-based learning and career exploration, including job shadow, strengths assessments, internships, leadership development, community service, and more. This school year, CAMP partnerships are growing faster than ever before.



The Caterpillar Foundation, America Makes, Resonetics, Dayton Region Manufacturers Association, the Air Force Research Laboratory, Laser Institute of America, and others have invested their time, talent, and treasure in CAMP and our STEM students.

“Our partners are invaluable to learning at STEM,” said Stephanie Adams Taylor, Director of Strategic Partnerships at the Dayton Regional STEM School. “We are so grateful to everyone who has been on this CAMP journey with us. Now, as we look to the future, we want to build on this momentum and grow our connections with industry. This will allow us to sustain our programs financially, provide mentorship for our students, and ensure that we are meeting the true and current needs of the workforce in Dayton. We are thankful to Dr. Dossier for the fantastic example of how strong partnerships can impact generations of students to come.”



CAMP DOSSEY

Center for Advanced Manufacturing and Photonics



“I am delighted that we were able to make CAMP happen,” said Dosser, who has made personal donations totaling over \$700,000 since the lab’s founding. “My late wife and I have always supported education and that trend can and will continue. When I observe the appreciation of the teachers and students, I realize it is simply not enough. There is so much more to do. Dayton has a strong history of innovation and manufacturing. It is part of our DNA. The point to remember is there were a lot of people that made this happen and want to assist in the future.”

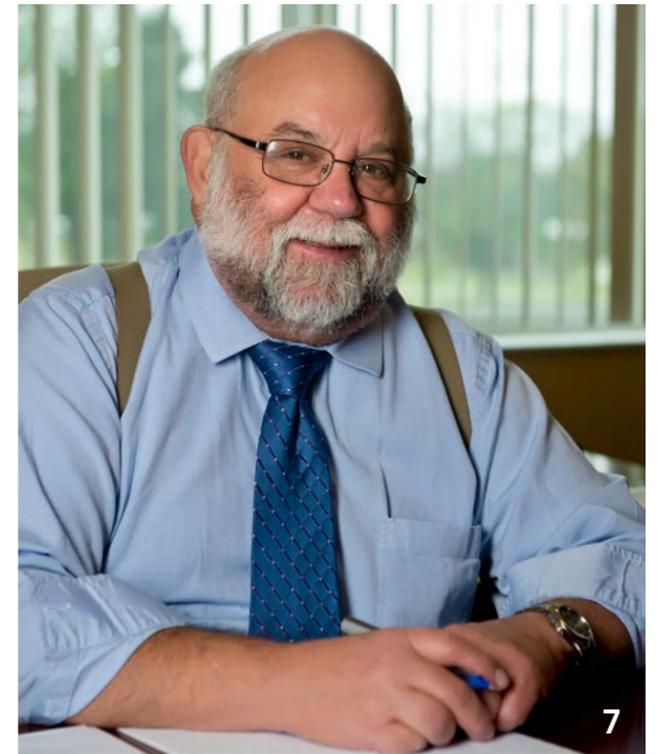
One student who has recognized Dayton, Ohio for its vast opportunities is Antoine. “After graduation, I plan to attend the University of Dayton to study mechanical engineering. I feel that CAMP Dosser and the STEM School has prepared me for what is next in my future. My work in the lab allowed me to learn skills you do not learn elsewhere. One of my favorite things about this technology is that we can create practical solutions to real world problems. I also love seeing ideas and projects come to fruition for students and teachers.”

“We are proud to recognize Antoine Gagne as the Dayton Regional STEM School’s Class of 2022 Valedictorian,” said High School Principal, Jessica Short. “This student possesses all of the qualities to be a leader and change maker in the world of engineering and beyond. His dedication to the success of CAMP is just one of the many ways he has displayed these qualities. Antoine’s love of learning extends outside of the classroom and will open many doors for him in his future endeavors.”

“I cannot think about learning without thinking of physicist, Richard Feynman, and the joy of learning,” said Dosser. One of the most well-known scientists of the 20th century, Feynman earned a Nobel Prize for his collaborative work on the development of quantum electrodynamics, among many other contributions to physics. He also built a legacy of reimagining and redefining the learning process. “Feynman’s philosophy was a life filled with humor, science, and learning. The spirit of learning lives in the STEM School and is embraced by faculty and students, just like Antoine.”



6



7

PHOTOS:

1. Center for Advanced Manufacturing & Photonics
2. Antoine Gagne working with the laser cutter
3. Student lab assistants, Maddie, Joe, and Nick
4. Nick Heyart demonstrating 3D printer to 6th graders
5. Resonetics at the College & Career Fair
6. Gagne at 2022 Commencement with Dr. Fisher
7. Dr. Larry Dosser
8. Teachers collaborating on a project



STEMMERSION RETURNS FOR 2022

After a two-year hiatus, our annual STEMmersion experience returned with a BANG! For the final 10 days of the school year, normal classes ended and each student had the exciting opportunity to deep-dive into one STEM topic from a long menu of courses created by our teachers. From cross-country adventures to crash courses in aviation, there is something for everyone. STEMmersion is a time for discovering a love of learning, bonding with peers, using transferable soft-skills, and stepping outside of comfort zones. Check out this year's STEMmersion courses and photos from the highlight of the year!

- Camping Unplugged
- Flight 101
- Get Your Putt-Putt On
- Laser Lab at CAMP Dossier
- Oh Snap! Intro to Photography
- Science of the Final Frontier
- STEM Olympics
- STEM in Nature
- ACE-ing Leadership
- Cave Geology
- Chinese Characters and Calligraphy
- Holiday Extravaganza
- Passport to Dayton: Time Travel the Gem City
- Pen Making
- Tabletop Game Design
- Tiny Houses
- Audio Engineering
- CSI: STEM
- DRSS Serves Dayton
- Wilderness Canoeing
- Filmmaking 101: The Innovators Strike Back to the Future and the Sorcerer's Infinity Stone



I began to research what could be done to predict HAB events in our waterways in order to improve water quality. I specifically focused on North Atlantic Ocean water temperature patterns and their influence on rain and temperatures in Ohio and Lake Erie. I was able to establish, for the first time, a predictive pattern. Using this information, I wrote computer code that predicts the HAB events from large lakes, like Lake Erie, to small neighborhood ponds.

These findings were so valuable to the National Oceanic and Atmospheric Administration (NOAA) and the National Ocean Service (NOS) that they began using my work to cross-check their HAB forecasts for Lake Erie. Even though my research is in ecology, biology, statistics/mathematics and computers, this work can also be used for human drinking consumption in communities near Lake Erie.

It would be exciting for a graduate student to have work cited by an organization such as NOAA; it would be even more of an honor and rarity for an undergraduate. I am very humbled that as a senior at the Dayton Regional STEM School, my passion project was impactful and cited in this professional research. As a high school student, this shows hard work pays off and that we can -- and do -- make a difference. I know this work helped in giving the NOAA confidence when cross-checking their 2021 climate models. The organization has also asked me to continue refining my work into 2022.

This work has now spanned several years, and I am graduating from STEM. This entire experience, which all stemmed from following my passions, has inspired me to pursue a career in this field. After graduation, I plan to attend The Ohio State University to double-major in environmental sciences and statistics. Without the Science Fair and the Dayton Regional STEM school, none of this would have been possible. As STEM students, we all can make a difference.

CHECK OUT MY PROJECTIONS CITED IN THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION HAB BULLETINS HERE!

Western Lake Erie Harmful Algal Bloom Early Season Projection

11 May 2021, Projection 01



The severity of the western Lake Erie cyanobacterial harmful algal bloom (HAB) depends on input of bioavailable phosphorus from the Maumee River during the loading season (March 1-July 31). This product gives an estimate of potential bloom severity based on a combination of measurements and forecasts of river discharge and phosphorus loads from now into July. These projections will be updated with new data and weather models each week until the NOAA seasonal Lake Erie HAB Forecast is issued on June 30th, using measured spring phosphorus loads, and a more complete set of bloom models.



With data through May 9, the bloom is likely to be smaller than average, and it is expected to have a severity <6. We do not expect a large bloom (like 2017 or 2019). Discharge of water from the Maumee River was below average in March and April, due to lower than average rainfall, which led to low phosphorus loads in early spring. Weather systems in May are bringing rain to the region, which will lead to a wetter than normal month that will bump up the phosphorus load. There is uncertainty in the weather models on exact amounts, placement and intensity of rainfall in May which leads to uncertainty in the discharge, and the HAB forecast. In June, we expect a return to normal rainfall with less uncertainty.

Total bioavailable phosphorus (TBP) is the sum of dissolved phosphorus and the portion of particulate phosphorus available for HAB development. The TBP loads are projected based on Heidelberg University data, river forecasts from the National Weather Service Ohio River Forecast Center (through early July), and previous years to the end of July.

Stumpf, J. Noel (NOAA), Johnson (Heidelberg University), with assistance from Davenport and Tomlinson (NOAA), and D. Noel (Dayton Regional STEM School).

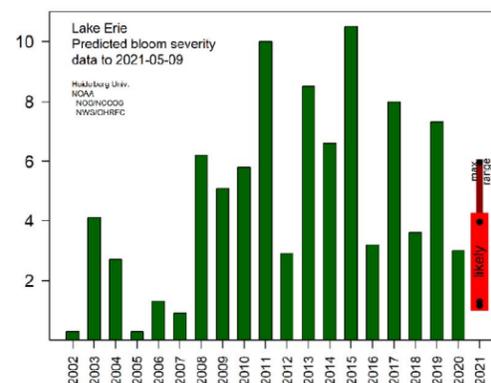


Figure 1. Projected bloom compared to previous years. The wide bar is the likely range of severity based on limits of model uncertainty. The narrow bar is the potential range of severity. Because the forecast uses modeled discharge for a month, there is uncertainty in maximum bloom severity.

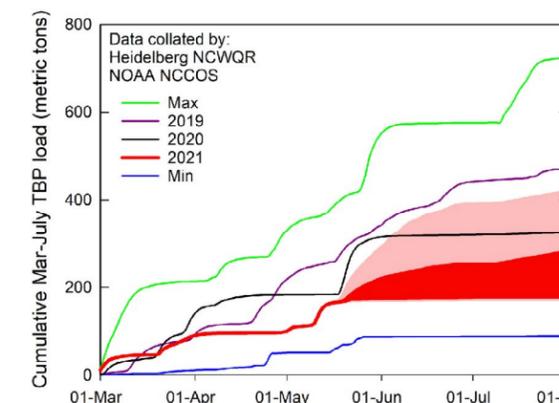


Figure 2. Cumulative total bioavailable phosphorus (TBP) loads for the Maumee River (based on Waterville). Each line denotes a different year. 2021 is in red, the solid line is the measured load to May 9, the red area shows the likely range for the remainder of the loading season, and the light red shows the possible range.

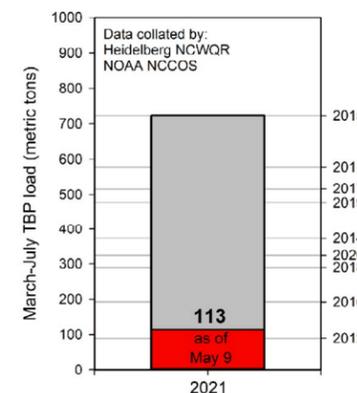


Figure 3. Total bioavailable phosphorus (TBP) load accumulated from the Maumee River near Waterville to date. The right axis denotes the TBP load from selected previous years. Loads to date are currently below the total for 2016.

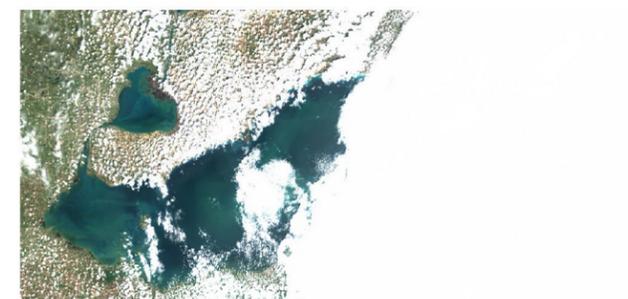


Figure 4. True color image on 7 May 2021, derived from the Copernicus Sentinel-3a satellite on the last clear day before two days of clouds and heavy rain. This image captures the lake after weeks of relatively dry weather.

WHAT IS ALGAL BLOOM?

FROM THE NATIONAL OCEANIC AND ATMOSPHERIC ADMINISTRATION

“Ranging from microscopic, single-celled organisms to large seaweeds, algae are simple plants that form the base of food webs. Sometimes, however, their roles are more sinister. Under the right conditions, algae may grow out of control — and a few of these “blooms” produce toxins that can kill fish, mammals and birds, and may cause human illness or even death in extreme cases. Other algae are nontoxic, but eat up all of the oxygen in the water as they decay, clog the gills of fish and invertebrates, or smother

corals and submerged aquatic vegetation. Still others discolor water, form huge, smelly piles on beaches or contaminate drinking water. Collectively, these events are called harmful algal blooms, or HABs. HABs are a growing problem in every U.S. coastal and Great Lakes state. While we can’t prevent these blooms, we can be better prepared. NOAA leads many research efforts to help coastal communities counter the environmental and health effects associated with these events.”

For more information visit: <http://www.ncwqr.org/> or <http://coastalscience.noaa.gov/research/habs/forecasting/>

plant trees...
plant hope!



Three STEM students received top awards in the American Institute of Architects Dayton's Art in Architecture Student Design Competition. Samantha Pochet (left) won the L2 Engineering Honor Award and a \$1000 scholarship. Rachel Saine received the Honorable Mention Book Award and Fiona Ferrari was recognized for Most Creative Use of Materials. Forty-four students from across the region participated in the competition to design a welcome center for the future makerspace at the Wright Brothers Hangers on the campus of the new West Dayton Library branch.

Congratulations to Lillian Robey, who won the poster contest for TreeFEST 2022. TreeFEST is an Arbor Day/Earth Day event sponsored by the Habitat Environmental Center of the City of Kettering. Volunteers gathered on April 16th at the Habitat Environmental Center and Southdale Woods to plant native trees and other pollinator friendly plants. Lillian's poster was featured in promotional materials and she received an award certificate during the ceremony.

Student Artists Put the "A" in STEAM



We are proud to recognize Ava Richards, whose Adobe Photoshop artwork titled "Hypervisibility" was selected as a Gold Key winner by Scholastic Awards. Awarded pieces have been recognized by a panel of creative professionals as the most outstanding work submitted among secondary students in our region. Since 1923, the Awards have recognized some of America's most celebrated artists while they were teenagers, including: Andy Warhol, Richard Avedon, Idelle Weber, Ken Burns, Paul Chan, and Kay WalkingStick. Ava's piece was included in a regional exhibit at K12 Gallery & TEJAS this spring and automatically advanced to the national awards in New York City.



Students **Lead** Dayton

BY JAVERIA SHAIKH, '24



August, 2020 was the start of my first school year at the Dayton Regional STEM School. At the time, we were studying virtually, so I was looking for a way to be involved in the school's community outside of the classroom. When I saw the opportunity to join a student committee to help plan the Students Lead Dayton conference, I thought it would be the perfect extra-curricular for me! Students Lead Dayton (SLD) is an annual event hosted at the STEM School that engages students in interactive sessions on various leadership topics, such as networking, diversity, and leadership strengths, which are led by partners and leaders in our community. Attendees are able to choose from a menu of concurrent sessions based on their own goals and interests, allowing each student to create their own adventure with a customized experience. Students were also given time to network with their peers and build relationships with fellow student leaders.

Within a few weeks of turning in my application to be a Students Lead Dayton (SLD) committee member, we already had our first meeting set up and were ready to start planning for our October 2021 event! Since this was the second time SLD would take place, there was already a solid foundation for the committee members to work with. Our role was to provide feedback and ideas to the STEM School staff to help engage more students, as well as help with event logistics and execution. As a team, we began to brainstorm breakout session topics and facilitators that could make a big impact on attendees. Before long, a few committee members decided to design a session of our own for our peers.

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As I became more immersed in our STEM community, I learned self-awareness was one of the key elements in leadership. This quality is something my fellow committee members also acknowledged, which is why identifying your own strengths as a leader became the focal point of our session. We planned an interactive activity in which students would associate themselves with a “spirit animal” that matched how they predominantly acted as a leader. We provided scenarios for the students to reflect on and choose how they would best react in each situation. We called our session “The Four Temperaments of Leadership”.

As September quickly approached, there was nothing that excited me and the rest of the committee more than the thought of being at the event. We met frequently to help staff prepare for the 100 student attendees that would come from schools across the region. September 30th marked one day until the conference. We had one final meeting, during which we rehearsed our session one last time and clarified any last-minute questions regarding the next day’s agenda. By the end of the school day, we were ready for showtime!

The next day was full of excitement. The committee members arrived at the STEM School early for one last briefing before students and partners began to check in. More than any other emotion that morning, I was excited! Excited to attend the conference as a student, but also to host a session myself and see the committee’s hard work come to life.

Until joining the SLD committee, I did not see myself as someone who could be a leader. What I came to realize as I worked with this group was that leading is not something only top executives perform in their jobs, but is rather required at every level of an organization for it to function. Anyone can be a leader if they choose to be. I couldn’t wait for other students to realize this, as well.

Throughout the day, the committee members were delegated tasks, such as welcoming partners and students into the school, handing out notebooks and schedules, directing traffic between sessions, and simply being approachable for our peers if they had questions. However, our most important role as committee members was to enjoy attending sessions with the other students. We all had goals of our own that we wanted to accomplish, contributing to our own growth as leaders. While I was especially looking forward to

leading the session I had worked on with my fellow committee members, I also wanted to meet leaders of the community and hear their personal experiences and accomplishments that shaped them as people and their views of leadership. I wanted to interact with students from all different grade levels and other schools in Dayton. Most of all, I wanted to learn as much as I could to enhance my leadership skills and to become a better student leader for my community.

The session topics were incredibly interesting and offered something for everyone. For example, Ms. Elston from Wright State University hosted “Lead With Your Personality”, an activity-based session using a color-coded personality indicator to identify individual personalities and how they affect a team. Mr. Usman, a STEM School alumnus presented on servant leadership, analyzing problems, and developing solutions. Ms. Bonifas from Goodwill Easter Seals Miami Valley discussed the nuances of personal branding and social media. Christa Johnson from the University of Dayton’s Ethics and Leadership Initiative facilitated a presentation called “How to Act with Integrity and Why Courage is Key”.

I chose to attend sessions focused on self-awareness. I was educated on how our bodies internally function through a discussion on mindfulness, better understood my personality thanks to Ms. Elston’s activity, and discovered the beauty of philanthropy by attend-



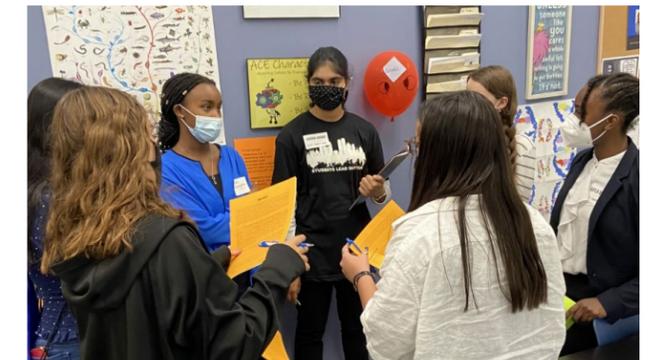
ing a session with the Miracle Makers student organization at Wright State University. The biggest takeaway I had was that at times the most meaningful outcomes and climacterics in one’s life require the smallest contribution from an individual.

When the time came to host my own session with fellow committee members, I had already learned so much throughout the day and was bubbling with anticipation to share with others. During our “Four Temperaments of Leadership” session, the room was packed and filled with energy. Participants moved around the room to discuss how they would lead based on scenarios, eventually tying them to their “spirit animal” -- a fox, beaver, dolphin, or owl -- that embodied



most. Our goal was for students to learn more about themselves as leaders, as well as how to interact with people that have different styles and temperaments than their own. At the end of the presentation, our team left thrilled by the enjoyment of our participants.

Before I knew it, all five breakout sessions were over and the SLD conference was coming to a close. We collected surveys from attendees with session ratings and overall feedback from the day, which would help us plan for future events. Finally, we all met outside for a group picture to commemorate the conference. As students began to leave, I wanted them to feel all the things I was feeling.



THANK YOU TO OUR PARTNERS

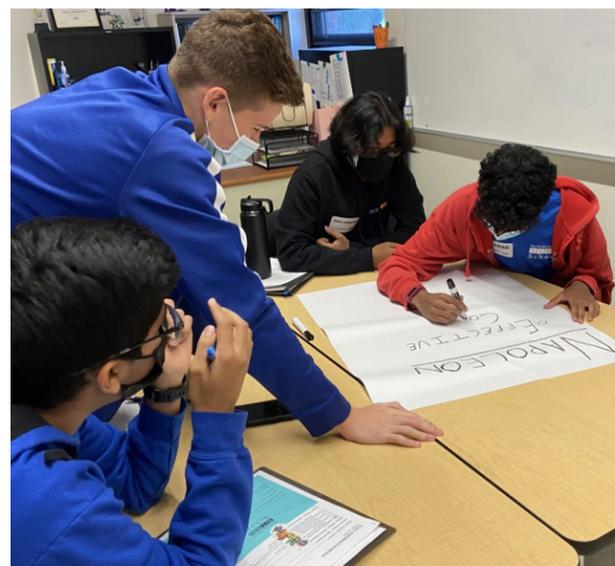
FOR FACILITATING ENGAGING DISCUSSIONS WITH OUR YOUNG LEADERS

- Identifying Characteristics of Effective Leadership - Justin Fiehrer, Sinclair College
- Stepping Up for the Greater Good - Huthayfa Usman, University of Dayton
- How to Act with Integrity and Why Courage is Key - Dr. Christa Johnson, UD’s Ethics and Leadership Initiative
- You Are Worthy - Lauren Ross and Raegan McCullough, The Healthy Teacher
- Bully, Victim, Bystander, or Hero (Your Choice) - Tom McMurtry, Retired Police Officer
- The Future of Work and Your Role In It - Bryan Stewart, Learn to Earn / Montgomery County ESC
- Social Media and Personal Branding - Jennifer Bonifas, Goodwill Easter Seals Miami Valley
- Disability and Leadership - Jeff Berk, Mad River Local Schools
- Lead With Your Personality - Dr. Amy Elston, Wright State University Partnerships and Field Experience
- Goal Setting for Leaders - Dr. Scott Williams, Wright State University Raj Sooin College of Business
- Networking 101 - Bing Bigham, Wright State University Alumni Association
- Making Miracles... Even as a Broke College Student - Abby Adams, Wright State University Miracle Makers
- Raider Roundtable: A Q&A on College Life and Leadership - Student Ambassadors, Wright State University
- Mindfulness and Beyond: Benefits of Yoga for Leaders and Teams - Vijaya Patil, Utsahi Yoga Foundation
- FaceTime: How to Communicate Effectively IRL - Caryn Spence, The Dayton Regional STEM School
- Self-Care 101 - Kate Kramer, The Dayton Regional STEM School
- Finding Your Passion - Philip Bottelier, The Dayton Regional STEM School
- Let’s Talk It Out: A Guide to Resolving Conflicts - Tasha Wilson, The Dayton Regional STEM School

The most meaningful thing about being an SLD committee member was seeing the enjoyment and engagement of other students around the topic of leadership. I wanted my peers to leave understanding their importance and value as a student leader. I wanted them to leave more aware of what leaders are already doing to make Dayton a better place, and empower them to do the same. I wanted them to walk away with connections and resources in hand and to reach out to fellow leaders whenever needed. Above all, I wanted them to take the first step in whichever direction their leadership journey would take them. I feel confident that we accomplished all of these things and more during the SLD '21 conference!

The Students Lead Dayton committee already has exciting plans for our next annual conference on November 14th, 2022. We plan to broaden our scope of attendees and reach even more students throughout the Dayton region. Reviewing the survey feedback has provided us with fantastic insight and great ideas for next year's session topics, partner connections, and opportunities for networking. Our committee is also expanding. We have recruited more students to be part of the planning process, providing diverse representation and insight on what will truly engage the next generation of leaders.

Joining the SLD committee was a turning point in my high school career. Being a part of the conference allowed me to realize my passion for leadership and collaboratively working with equally passionate people. I am so proud of how much I have grown as a leader in such a short amount of time, and I can't wait to help more students have the same experience!



VISIT DAYTONSTEMSCHOOL.ORG/EVENTS TO LEARN MORE ABOUT ATTENDING OR PRESENTING AT STUDENTS LEAD DAYTON ON NOVEMBER 14, 2022!

SLD COMMITTEE '21

Hailey Allen, Class of 2022
 Kaylee Ballard, Class of 2022
 Kristen Davis, Class of 2022
 Eva Gibson, Class of 2023
 Neha Pasupuleti, Class of 2023
 Caitlin Johnson, Class of 2024
 Tayla Robinson, Class of 2024
 Javeria Shaikh, Class of 2024
 Joseph Wright, Class of 2024

SLD COMMITTEE '22

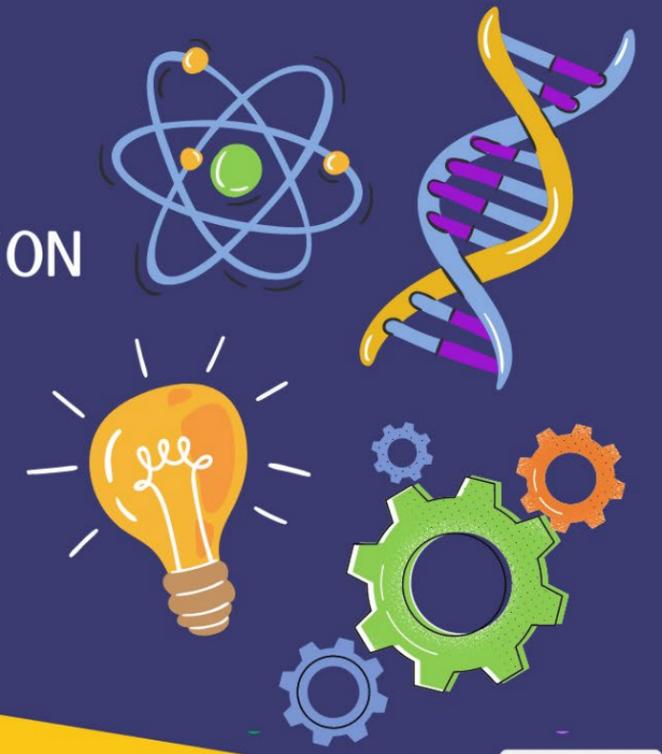
Markala Allen-Badgett, Class of 2023
 Eva Gibson, Class of 2023
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 Samantha Pochet, Class of 2023
 Zoe Sweere, Class of 2023
 Caitlin Johnson, Class of 2024
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 Megan Noel, Class of 2024
 Jillian Overmyer, Class of 2024
 Alexander Watson, Class of 2024
 Joseph Wright, Class of 2024
 Brandon Brown, Class of 2025
 Alika Macon, Class of 2025
 Deja McGriff, Class of 2025
 Rhea Pasupuleti, Class of 2025

Thank you to all the student committee members who continue to make Students Lead Dayton a growing success!

DAYTON REGIONAL STEM SCHOOL

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The Dayton Regional **S T E M** School
CLASS OF 2022

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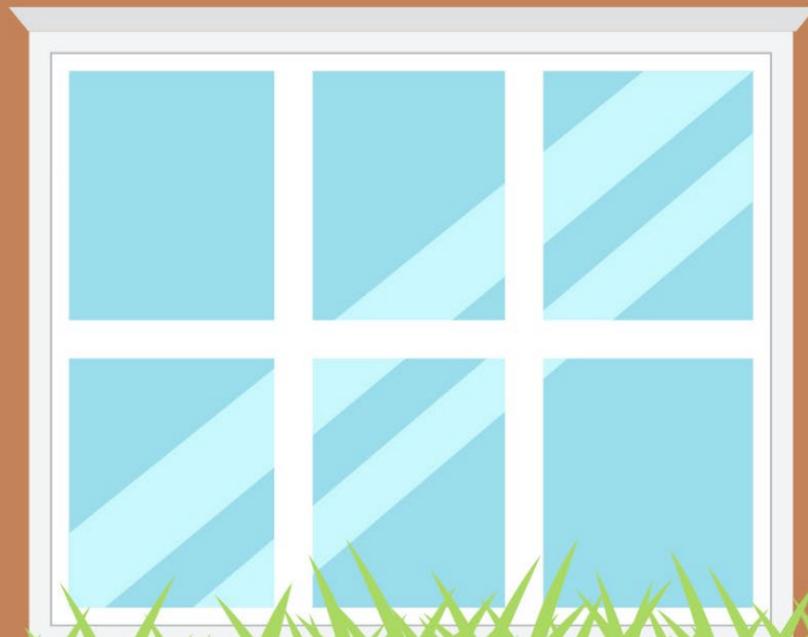
Did you know that the STEM School is a non-profit 501(c)(3) organization and accepts donations?

Because of our regional population, we cannot levy local taxes and are restricted to the per pupil funding provided by the state of Ohio. However, public independent STEM schools are the lowest funded school model in the state. As we actively work with legislators to advocate for equitable funding for STEM education, the philanthropic support from our families, partners, and community has allowed us to continue the great work we do for students across the Dayton region.

There are so many ways to make an impact on the lives of STEM students. We invite you to explore giving opportunities at DAYTONSTEMSCHOOL.ORG/GIVE, including monthly donations, employer matching gifts, grant recommendations, and shopping rewards programs. All donations are tax deductible.

Thank you, STEM Supporters, for your continued partnership and generosity!

S T E M



OUR PARTNERSHIPS

Achieving our Mission would not be possible without our steadfast community supporters. Our collaborative partners in industry, education, government, and non-profit sectors have provided students and faculty with the mentorship, insight, opportunities, and resources. Below is just a small sampling of the incredible partnerships that have helped bring learning to life this year. Thank you to ALL of our STEM partners for giving your time, talent, and treasure to the Dayton Regional STEM School.



ALUMNI NOTES

Jocelyn Everett '20 is studying business administration at Heidelberg University, with a minor in writing. Jocelyn recently redesigned and published a website to help raise funds for the Seneca County Council on Homelessness.

Luke Miller '13 earned a bachelor's degree in computer science and software engineering from Rose-Hulman Institute of Technology. He now works as a software developer in Milwaukee, Wisconsin.

Hayley Clark '20 is working as a merchandiser for Sheehan Brothers, a contemporary cafe and vending machine supplier. Hayley is also attending Clark State Community College.

Rachael Stowe '18 was awarded the 2020-2021 Distinguished Undergraduate Award for the University of Pittsburgh School of Education. She was also elected as the Chief Justice for the Panhellenic Conference at the university.

Nicole Sword '18 attended the United Nations Peace Summit for Emerging Leaders in Bangkok. She studied political science at Ohio University, where she won the Jenkins-King Award. She recently studied abroad in Northern Ireland.

Grant Shaffer '19 is currently working as a student researcher in a neurogenesis lab at Wright State University, researching treatment for secondary multiple sclerosis. He is pursuing a degree in neuroscience and also teaches and choreographs for Miami Valley Dance Center.

Tanner Banks '14 recently accepted a position as a computer operator subcontractor at the Air Force Research Laboratory. He earned his bachelor's degree in business administration from Bellarmine University.

Terence Wilcoxson Jr. '18 earned college honors at Central State University.

Sierra Davis '13 earned her degree in accounting from Bowie State University and is now working as a tax examiner.

Athena Fretz '19 was promoted to Student Chef at Oaks Dining Hall and made the Dean's List at Bowling Green State University, where she is studying biology with a specialization in marine and aquatic biology.

Samantha Mrozinski '13 earned her Master's of Arts in Teaching from California University of Pennsylvania and is currently working toward a second teaching certification in physics, as well as a realtor's license as a side hustle. She lives in Pittsburgh, where she serves as a building substitute teacher.

Kyle Cullen '19 is studying mechanical engineering at the University of Dayton and also manages a golf course.

Jordan Young '20 is a sophomore at Morehouse College in Atlanta, Georgia. He is studying applied physics and engineering, and also served as a summer intern at Wright Patterson Air Force Base.

Dominique Redmon '15 received her PharmD from Ohio Northern University.

Sarah O'Connor '20 competes for the University of Dayton women's golf team. She was named the Metro Atlantic Athletic Conference Rookie of the Year after her second-place finish at the 2021 MAAC Championship. This was highest for a Flyer at the conference tournament in program history. The three-day event was played on the Disney Magnolia Course at par 72. She was also recognized on the Women's Golf Coaches Association All-American Scholars Team following the 2020-21 school year.

Olivia (Hampton) Cross '14 earned her bachelor's degree in accounting from Colorado State University - Global Campus and just recently earned her Master's of Business Administration. She's now working to become a certified public accountant to wrap up her education while she continues to work as a staff accountant.

Clara Schulze '20 is a biomedical science major at the University of Dayton. She continues to compete in Irish dance for the Richens/Timm Academy of Irish Dance and returned from the 2021 United States Irish Dance Championships, placing 9th in the nation, and qualifying for the World Irish Dance Championships in Belfast, Northern Ireland in April.

The Dayton Regional
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