

***FIRST* Impact Award - Team 4145**

2024 - Team 4145
Team Number
4145
Team Nickname
WorBots
Team Location
Worthington, OH - USA
Describe the impact of the <i>FIRST</i> program on team participants within the last 3 years. This can include but is not limited to percentages of those graduating high school, attending college, in STEM careers, and in <i>FIRST</i> programs as mentors/sponsors.
In the last three years, 100% of our alumni graduated from high school and went to college (compared to 92% and 83% of alumni district-wide respectively) and 92% pursued STEM degrees (compared to ~40% district-wide). 71% of alumni from the past 3 years remain involved in FIRST through event volunteering and FIRST mentorship. Our team members have a 3.9 unweighted/4.1 weighted GPA average (3.1 district unweighted average) with 75% of students taking PLTW courses in addition to team involvement.
Describe your community along with how your team addresses its unique opportunities and circumstances.
11 elementary, 5 middle, and 2 high schools make up Worthington City Schools. Before our team, PLTW courses were the sole access point for STEM. To increase access, we started 4 student-mentored FIRST teams we fund annually, promote STEM at 40+ events annually, partner with SWENext groups and PLTW classes, and advocate for STEM within our school district. Students on our team also work with engineers from our sponsors, providing real-world STEM exposure to Worthington students.
Describe the team's methods, with emphasis on the past 3 years, for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative. How does your team measure results?
We host the CORI Invitational for 30+ teams, which school officials and community members attend to see FIRST in action. We advocate for STEM spaces, funding, and events to our school board annually, all of which have been achieved. For youth, we started and sustained a FIRST pathway of 100 kids annually on 5 FIRST teams and run activities for all ages. Outreach and feeder teams excite youth about STEM; 37.5% of our members come from a feeder team and 87% attended outreach prior to joining.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
We published 27 resources on our website covering all topics—reaching 200 teams. At the 2023 Greater Pittsburgh Regional, FRC 7570 from Poland and 8861 from Turkey didn't have many members of their team to cheer them on because of the far distance, so we made posters to support them each match—

even when they were on the opposing alliance. We give safety kits to every team at every event and rookie goodie bags to new teams including treats and cards including lessons we've learned.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

We started, funded, and mentor 3 FLL and 1 FTC team. We met with 7 schools and our Director of Primary Education to grow Worthington FIRST. We virtually assisted 3 teams from Brazil (7565, 7567, and 9487) with award submissions and operations in 2023. From 2022 to now, we have consistently worked with FRC 8856 (now 9545), helping them with everything from outreach to competition packing lists. We connected initiatives in Germany and India with resources for starting FIRST teams.

Beyond starting teams, what initiatives have you done to help inspire young people to be science and technology leaders and innovators? What results have you seen from your efforts in the past 3 years?

We work with the 1-week Gateway to Technology Camp, guiding elementary students through interactive STEM activities. We have made STEM engaging and fun for all through 128 events in the past 3 years (59 this season) such as coding workshops, engineering design challenges, demonstrations, science days, and STEM fairs. These events connected 87% of our current students (75% in 2023) with our pathway, as we are dedicated to not just reaching students but connecting them with STEM long-term.

Describe the partnerships you've created with other organizations (teams, sponsors, educational institutions, philanthropic entities, etc.) and what you have accomplished together with emphasis on the past 3 years

ATS Automation and Lake Shore Cryotronics provide us with sponsorship, internships, and engineering advice, allowing our students to extend their STEM knowledge beyond high school. PATH Robotics provided a tour of their robotic welding facilities and they now mentor our team. FC Bank provides us space at Worthington Market Day and Columbus Crew games, connecting us with over 20,000 people in 2023. PLTW and business teachers work with us to connect STEM and business-focused students with FIRST.

Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, *FIRST*, and your communities.

We permanently reduced fees by 60% in 2022 and waive them as needed to ensure they're not a barrier. We support travel to competitions and the Championship as needed when we qualify, increasing accessibility. We partner with SWENext at our schools to run women in engineering workshops. We have an all-girls drive team for our off-season robot annually. 75% of our student leadership and 50% of our membership (33% in 2021) is female. We run STEM and leadership workshops for elementary Girl Scouts.

Explain how you ensure your team and the initiatives you have created will continue to run effectively for the foreseeable future

87% of our team members joined because of outreach and 38% were involved in FLL or FTC, so WorBots know the importance of outreach even before they do their first event. Through documentation of steps to establish and run each event activity, we ensure team members can sustain every initiative. Peer-to-peer new member training ensures every student joins the team prepared and confident. We also sustain a rainy day fund to ensure the team can continue to operate if funding were to change.

Describe your team's innovative strategies to recruit, retain, and engage your sponsors within the past 3 years

Each summer, we go through industrial parks and note STEM companies. We then send letters, call, and present to companies interested in partnering with us. Sponsors are investing in more than a robot, they're investing in the future of STEM; 6 alumni from the past 3 seasons currently are interning or working with sponsors. Tours, email updates, and photos/videos engage sponsors throughout the season. We went from barely making it through each season to maintaining a rainy day fund in 3 years.

Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements.

We are working to standardize our mentorship of FIRST teams. We created a guide to prepare team members to best help whenever asked, whether that's answering questions through social media or providing at-competition help. We are also working on a student mentorship training series in partnership with our FLL and FTC coaches, walking prospective student mentors through the basics of each program, how to best support FLL and FTC students, and how to guide students through the FIRST Core Values.

Describe your team's goals to fulfill the mission of *FIRST* and the progress you have made towards those goals.

Our goal is to cultivate a culture of STEM in Worthington, Ohio. We built a feeder pathway of 100 students. When we were founded, we had less than 20 students, and FIRST was only at the high school level. In 3 years, we have gone from 10 to 40+ annual community events, growing STEM opportunities locally and expanding our annual reach by ~20,000. Through local advocacy, we secured STEM education spaces as Worthington remodels, providing educational opportunities for years to come.

Briefly describe other matters of interest to the *FIRST* Judges, including items that may not fit into the above topics. The judges are interested in learning about aspects of your team that may be unique or particularly noteworthy.

This season, our team is working to develop STEM opportunities for youth in the Ohio Juvenile Justice System. We have developed activities booklets that use resources available to them to learn more about STEM through activities and experience alongside former correctional officers and presented this project to administrators of the Ohio Juvenile Justice System. We are now working with teachers in the Ohio Juvenile Justice System to make final modifications and implement this project.

Judge Feedback

Who/When

Feedback

Mar 24,
2024
09:43:54
PM EST

How can we better provide insight on events in our written submissions and presentation—more stories or statistics?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

Founded in 2012, the WorBots are cultivating a culture of STEM in Worthington, Ohio, by engaging, inspiring, and impacting our community. We connect both high schools in the Worthington City School district, Worthington Kilbourne High School (WKHS) and Thomas Worthington High School (TWHS). Despite the rivalry of our schools in nearly everything else, we partner in STEM education and inspiration, creating an impact felt throughout Worthington. When we began, we were a team of less than 20 FRC students. Today, our program of FIRST students encompasses nearly 100 students K-12 across 5 teams.

WE ENGAGE We participated in 59 outreach events this season and 128 outreach events in the past three, engaging 200,000+ people in 3 years and spreading STEM locally. We annually host 15 interactive workshops and tours, connecting anyone from elementary schoolers to engineers with STEM hands-on! From engineering and design workshops for youth to lessons on driving a robot, we excite our community about STEM. At 5 pre-K-5 Scratch Jr. workshops, coding challenge events for middle schoolers, and 3 interactive robotics workshops, we connected over 100 kids with engaging STEM activities at a local library. Within our schools, we appear everywhere from curriculum nights to pep rallies and football games, and we connect engineering-focused students with FIRST through PLTW presentations reaching 200+ students annually. Further, we are regulars on both schools' student news segments.

We engage people throughout Ohio. We were chosen of the 28 Ohio teams American Electric Power (AEP) supports to be featured in "AEP Helps Robotics Teams Rise"—an internal article highlighting the "hours of planning, testing, reviewing, retesting", us being "passionate about community outreach, offering demonstrations at elementary schools and local events and organizing charity drives", and the impact their funding and support has on teams like ours. We were incredibly honored to represent FIRST and AEP in this article. At the Buckeye Regional, an AEP employee and his son stopped by our pit after reading about us in the article, as they learned about FIRST through this and wanted to see it in action. We were also featured in a subsection of the Columbus Dispatch, discussing FIRST in Worthington and the impact it has on students.

We engage youth through community events. At the 2024 Alum Creek Elementary Introduction to STEM and Trades Fair, we drove a robot and talked about STEM careers! At the Evening Street Eagle Expert Extravaganza, we ran a workshop for elementary schoolers teaching the engineering and design process through a game challenge they created solutions for. At Worthington Science Day, we bring a robot and discuss STEM education K-12 with 1,000 community members annually. At Bluffsview Elementary Care After School, we ran an interactive demonstration for 30 students aged 5-10. At Wilson Hill Elementary, we started and ran a robotics club teaching students STEM basics, exciting students who later went on to join FLL 61943. Through these events, we are not just reaching kids once; we are giving them skills, knowledge, confidence, and future STEM opportunities that generate a lasting impact, as shown by 87% of our team members attending an outreach event prior to joining.

We engage the broader Worthington community. At Worthington Market Day, the largest single-day event in Worthington bringing together 100,000 people from across Ohio, we drive a robot, speak to community members about STEM, and run engaging activities for young kids—not just showing them STEM but including them in it. Through this event, we've gained a mentor and connected 8 students with the Worthington FIRST Pathway in two years, reaching community members who once didn't know about STEM opportunities locally. At a Columbus Crew Game in 2023, we had a booth on the plaza where we reached 20,000 people. Here, we talked to families from 7 Central Ohio districts about how to get

involved with FIRST. We also spoke to Paul LaRue, President and Member-at-large of the Ohio State Board of Education, who spoke with us about the future of STEM education in Ohio and said that programs like ours were shining stars.

WE INSPIRE We inspire youth within our community to get involved with FIRST. We are creating a cohesive pathway for STEM through starting, funding, and mentoring FLL 44451, FLL 44452, FLL 61943, and FTC 16284, impacting 100+ students. We hosted the first annual Worthington FIRST Banquet in 2023 where each team showcased their team and robot to one another, exciting kids at each level about opportunities ahead. We also recognized and awarded each pathway student. We annually host FLL students in our shop where they present their Innovation Projects and drive our robot, exciting them for future opportunities in FIRST. We facilitated a brainstorming session for our FTC students after their kickoff this year, helping them get their season started. Our consistent partnership resulted in 80% student retention in the Worthington FIRST Pathway with 38% of WorBots being from these teams despite the oldest feeder team starting in 2018. Beginning in 2022, ATS Automation and Lake Shore Cryotronics have offered internships to recent team graduates, providing real-world STEM involvement and expanding our vision of a K-12 pathway through college.

We inspire young kids to explore STEM. At the Olentangy Caverns Geology Camps, we demonstrated our robot to 68 students ages 6-11 and talked about how robotics is in many aspects of the world around us—including geology! We also volunteer throughout the week-long Worthington Gateway to Technology Camp annually, where we work with 20+ elementary school students and guide them through STEAM crafts and activities, LEGO design challenges, and CAD. One of the kids' favorites was active origami, where they added LED lights and small motors to paper penguins. These activities bridged the gap between fundamental STEM knowledge and arts and crafts that typically excite younger kids, making STEM enjoyable for all.

We inspire girls throughout our district to get involved with STEM. In 2023, we hosted a group of 30 3rd-grade Girl Scouts for a shop tour to drive robots, learn programming basics, and complete an engineering and design course. We helped 25 1st-grade Girl Scouts earn their robotics badges by teaching them how robots moved as they learned to drive a robot in 2024. They also learned how to design their very own robot, and worked together to complete innovation challenges. At the end, they got their own "robot driver's licenses." At the high school level, we regularly work with SWENext groups to connect engineering-focused women with STEM. In 3 seasons, we have gone from 33% to 50% female, including 75% of team leadership this season.

WE IMPACT We impact the future of STEM education in Worthington. In 2021, we began our Worthington STEM Advocacy Project to gain support for STEM, as both of our high schools were being remodeled and we were at risk of losing STEM space. We invited the school district to our shop to present the impact of STEM on Worthington students and the community. We then spoke about STEM at a school board meeting and a community planning meeting. The district invited us to a meeting with the directors of primary and secondary education and principals for both high schools to discuss growing FLL/FTC, where we were able to gain stipends for Worthington FIRST. Our presentation to the district also developed into an annual event in which we now present the status of STEM in Worthington and then unveil our new robot for the season. STEM spaces are now expanding at both high schools—securing STEM education opportunities for generations to come.

We impact the global FIRST community. We worked with FRC 7565 and 7567 from Brazil throughout this

season, helping them prepare their award submissions, and we assisted rookie team 9487 from Brazil with team operations—all through Zoom and email. In 2022/2023, we connected FRC 6916 with sponsors, assisted them as they developed their robot, and aided them throughout the Buckeye Regional; we're now helping them to compete in the 2025 season. We also helped design slides for the 2023 Fairport FLL Qualifier, and one of our team families volunteered to set up, tear down, and run the event with FRC 578 while traveling to New York.

We impact our community through annual giveback activities. We participate in Turn for Troops, where we turn pens and write letters for veterans going on Honor Flights. We run resource drives for the Worthington Resource Pantry. Annually, we run LEGO drives with our FLL teams for the Ronald McDonald House of Nationwide Children's Hospital to share fun STEM activities with siblings of kids in the hospital—collecting 30+ LEGO kits each year. In 2021, we worked with FRC teams in Central Ohio to 3D-print face shields for essential workers in Delaware County during the Covid-19 pandemic. We also 3D printed adapted toys for a pre-schooler with limited mobility, such as a ferris wheel that produced bubbles when he pushed on a lever.

WE ARE THE WORBOTS In the past 3 years, we've expanded STEM opportunities through a cohesive pathway of over 100, inspiring youth to get involved in STEM regardless of their background. We've impacted over 200,000 people through 128 events. Our vision for a K-12 pathway has paved the way for lifelong opportunities starting in kindergarten and extending to careers in engineering. Our work has not just built learning opportunities; it has made a concrete impact through expanded STEM spaces in our district, connections with local leaders allowing us to further build STEM education in Worthington and beyond, and projects expanding STEM where it once was not. As WorBots, we have joined two "rivaling" schools to create an impact felt by thousands—not only cultivating a culture of STEM in Worthington, Ohio but reaching far beyond.;

