

FIRST Impact Award - Team 1038

2023 - Team 1038
Team Number
1038
Team Nickname
Lakota Robotics
Team Location
Middletown, 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.
We strive to inspire our students to pursue STEM careers, become confident and responsible leaders, and to be motivated to help their community. Over 50% of our active team is female, and we represent 13 local schools. Our teammates are driven academically, with a 100% high school graduation rate, and eager to volunteer in the community. Over 90% of our alumni have gone into STEM fields. Almost half of our 17 mentors are alumni, and our alumni around the country mentor several other FRC teams.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Our community is uniquely both rural and urban. We have worked to fight STEM education inequality in inner-city areas by mentoring FTC and FLL teams at schools and by starting teams at a weekend inner-city program. We also address issues with rural STEM education, partnering with local nonprofits to spread FIRST teams and other educational programs. We advocated for both these communities to congressmen and senators at the National Advocacy Conference, which we hope to attend again this summer.
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've built strong relationships with recreational and park organizations, attending more and more events every year. We host camps and workshops to bring STEM education to disadvantaged children. We keep track of how many people we reach and the student-hours we impact through our initiatives, and keep record of the community members we reach at demos. On our registration form, we have found "How you heard about us" quite useful when allocating our future resources to maximize recruiting.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
Our team members have been active as Student Ambassadors at each regional competition, helping maintain relationships with key FIRST partners. We also run and host a local FRC kickoff every year

where we coordinate interteam brainstorming for FRC teams. Furthermore, our students are always eager to help other teams at competitions. And when our robot broke the weekend before an off-season competition this fall, we still drove the three hours to attend to volunteer and cheer on our fellow teams.

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

Beyond hosting and running our official FLL tournament every year, we mentor several FLL and FTC teams with acquiring resources and sustaining their programs. The teams we work with feed into ours, and many of our strongest students come from local FLL and FTC teams that we support. We worked with FTC Team 10464 at the local FTC kickoff, mentored Team 18386 with outreach, and are working with school administrators to start an FTC or FRC team at a local school for former juvenile offenders.

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?

A few summers ago, we became the only partner in Western Ohio working with Girl Scouts on their robotics badges. We developed our own curricula for 3 badges, each for 4 different age groups, and teach 12 scouts at each of the workshops we run and host. Last summer, we ran and hosted free, four-week CAD, programming, and LEGO robotics camps at the Boys and Girls Club. We've also run and hosted a controls workshop for rookie FTC teams and, during COVID, an aesthetics workshop for Ohio FRC teams.

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

We recently began a valuable relationship with Salvagnini, a sheet metal company that bends our parts and mentors us through sheet metal design. They are always open to us watching them work and learning how to optimize for their equipment. We also work with the Boys and Girls Club on free summer camps, Reach Out Lakota to give back to our community, Reasling STEM on supporting dozens of FLL teams, and a local Air Force lab on spreading our message to thousands of fans at a local sports game.

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

Uniquely, our program is completely free for students, allowing us to build a vibrant community with members from diverse socioeconomic backgrounds, enriching all of our experiences. Open to students from all schools, our community includes students and mentors of countless races, genders, and identities. And we make sure that younger students we encounter find an FLL or FTC team, regardless of background. We also strive to promote inclusion through our targeted community impact initiatives.

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

We've been fortunate to receive a few large donations in the past 3 years. We've invested in valuable, unique resources that will serve us for years, like our Fuse 1 SLS 3D printer, while also investing a large portion of our team's savings for future use. We work with mentors to ensure that, if we have a few years with no income, our program and its \$40K budget can still thrive. And we make sure to include younger students in every project, passing knowledge to the next generation of leaders.

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

Our sponsor strategy has three prongs: outreach, sustain, and grow. Outreach involves cold-emailing potential partners our startup-style pitch deck and presenting to them, while also connecting with organizations like the Wright Brothers Institute and an Air Force lab through things like the Advanced Manufacturing Challenge. Sustain involves regular visits to keep sponsors updated. Grow involves doing more: valuable training workshops with sponsors or working to streamline our design process.

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

We look forward to mentoring even more FIRST teams. We currently partner with the Reasling STEM Foundation to support local FLL teams. In the past 2 years, we've invited FLL and FTC teams to our machine shop for training and taught CAD and programming workshops for them. This season, we started an FRC team at a local high school. We are also working with a school for former juvenile offenders to start FTC or FRC and mentoring an inner-city Saturday program that is starting several FLL teams.

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

Embracing our mentor-based program and family culture, we aim to foster dynamic student leaders with powerful communication and teamwork skills. We build people by building robots; our students and others we reach in our community are taught important leadership and teamwork skills in conjunction with technical ones. Through meticulous team-wide training and an encouraging culture, our students and graduates know how to be Gracious Professionals: diligent, inclusive, innovative, and empathetic.

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.

An ongoing long-term project is the Paul George STEM Learning Center. Named for a beloved late mentor, the 20,000 square foot building will be a local hub for STEM education organizations. Our new home will include a full machine shop, computer labs, and a full FRC practice field, all open to other local teams, along with space to host FLL and FTC teams. We are excited to be able to host more, large summer camps and after-school workshops, and this dream is closer than ever to reality.

Essay

In recent years, we've expanded our community engagement to focus on underserved children, starting FIRST teams and partnering with existing teams and nonprofits along the way. During the pandemic, we 3D-printed 20,000 mask ear-savers for first responders and local school faculty and staff. Since then, we've increased our engagement with businesses and other stakeholders to ensure our sustainability. All is in pursuit of our I-cubed philosophy: Impactful & Inclusive Initiatives.

Our team and 501(c)(3) are led by a Leadership Council of mentors and elected students. 2 student co-captains bridge the gap between 17 mentors and 45 active students, determining team goals, organizing our subteams (CAD, Mechanical, Controls, Media), and effectively communicating with students and parents. Our subteam leaders work on training and the robot itself. In the summer, we prioritize demo events, recruiting, and in-depth of season projects, and we focus on developing and implementing a rigorous training curriculum in the fall.

Demos Our students appreciate the impact FIRST has had on us—from teaching important technical and leadership skills to helping us meet some of our closest friends. We love sharing our experiences to help others have similar opportunities. We reach over 35,000 people every year at demo events, recruiting new students, mentors, and sponsors, referring younger children's families to FLL and FTC teams, and spreading the missions of our team and FIRST to countless companies, local political leaders, and other community members. We believe in quality over quantity; each and every person we reach gets personalized interaction and guidance for their children.

Our largest annual demo is the Dayton Air Show, where we reach over 20,000 people. In the shadow of C-17 Globemasters, we drive a popular high-five-giving robot around the tarmac and host FLL and FTC demos at our FRC showcase booth, meeting everyone from Blue Angels pilots to families that we introduce to FLL. We also attend the Butler County Fair, reaching 5000 people, recruiting new students, and forming connections with local politicians who advocate for our planned new building. This year, we attended the Peterloo Scout Camp for the first time, introducing 6000 scouts to FIRST, recruiting several students, and pointing countless families towards FLL and FTC teams we partner with.

As a community-based team, we have recruiting booths at four or more different high school orientations each year, reaching thousands of students and adding dozens to our team roster. By demoing at events like science fairs, weekly farmer's markets, school Pi Days, Fall Festival, and many more, we reach an additional 8500 people every year, including local business leaders, potential mentors, and, most importantly, countless families that we introduce to FRC, FTC, and FLL. We also use our skills and resources to support other events, working with a local park to build a course for the 2000-attendee Cardboard Regatta.

Community Relationships Our team is free for students to join, which contributes to our diverse community. But that also makes fundraising and sponsor engagement all the more important. Beyond "fun" fundraisers like the ones we host at local restaurants or sports games, we've worked hard to cultivate long-term, sustainable relationships with businesses who share our mission of building people through engineering.

In early 2022, we formed a partnership with Salvignini, a manufacturer of sheet metal forming equipment. This fall, we designed a single-piece drive base for swerve modules, and then held a design review with their chief engineers to optimize for their equipment. Visiting their space is eye-opening for us all, and they excitedly tell us how the relationship is mutually beneficial—we get help bending our parts, and they

form novel parts, pushing their machines to the limit and learning how to better serve customers. They are also opening up unique opportunities for internships for our students. We are excited to continue to grow our relationship.

Our longtime sponsors include companies like Northrop Grumman, and we treat our team like a start-up—from our organization structure to the pitch deck we created for potential sponsors and our regular check-ins, office visits, and tours to keep our partners informed. Many employees are so enthralled when they see our robot that they jump to mentor.

When organizations are looking to work with FIRST teams, we rise to the challenge. Last summer, we won the Wright Brothers Institute's Advanced Manufacturing Challenge, giving us the opportunity to partner with an Air Force lab (who was interested in learning about FIRST) to manufacture a dragon-drone attachment we designed. The project culminated in us showcasing our team and drone in front of 7000 fans at a Dayton Dragons baseball game, and the relationship has grown since. More recently, we've partnered with the 1819 Lab at the University of Cincinnati, which wanted to get more involved and contacted Ohio FIRST. As with Salvagnini, they do more than manufacture parts; they provide valuable insight into how to better design for their CNC machines, while we guide them through becoming more involved with FIRST.

We also recognize that there are ways to impact lives beyond STEM education. For the past 20 years, we've partnered with Reach Out Lakota, a nonprofit with whom we organize annual food, clothing, and supply drives for thousands of disadvantaged members of our community. We also work with Hands Against Hunger, recruiting volunteers in our community to provide high-protein meals for sub-Saharan Africa.

Other FIRST Teams We've also partnered with other organizations to encourage the growth of FIRST programs in our community, working with Reasling STEM, a local nonprofit focused on FLL. We work closely with their numerous FLL teams, providing resources and helping new teams get off the ground. We meet families with excited young kids quite often, and we always point them to a Reasling FLL team that we work with.

We've started several FTC teams, providing mentoring and resources to sustain them. This summer, students from a local FTC team worked with us on a summer camp. We mentor them through effective community outreach so they can augment their own efforts in the future. We also host programming workshops where our newer controls students learn alongside local FTC teams, all under the guidance of our controls team veterans. And we partner with FTC Team 10464 to have an FRC booth at their annual FTC kickoff, where we recruit for FRC programs like ours.

We've started 9 FRC teams in our history. This season, we've been mentoring the rookie FRC Team 9097 at a local high school through getting their program off the ground, helping with off-season mechanical training, explaining how FRC works, and providing our materials and past robots as learning resources. Additionally, we are working with a local school for former juvenile criminal offenders to start an FRC or FTC team, bringing FIRST to a unique community where STEM education can help turn students' lives around.

We've also worked to cultivate a community of Southwest Ohio FRC teams, taking the initiative to coordinate joint travel arrangements and planning interteam socials and activities. The vibrancy of our

local FIRST community is on full display every year at the FRC kickoff we host, where students from dozens of schools and teams come together. Students and teams bring varied levels of experiences. Everyone has a unique perspective, and we all eat together, wait together, watch the livestream together, and share our ideas.

We also advocate for FIRST, attending the National Advocacy Conference in DC to advocate for \$1.2 billion for rural and inner-city STEM education programs. One of us students volunteered to create pitch materials for the Miami Valley Regional (which struggled in recent years and was close to cancellation) modeled after our own pitch deck. We raised \$100K, ensuring continued opportunities for teams that lack resources to travel. We've also run and hosted an FLL tournament for 17 years, reaching over 400 attendees each year.

We also love to help other teams at competition; at an event last year, a team with no veterans and only one mentor had a robot that could only drive. They didn't have the resources or expertise to implement an acquisition or scoring mechanism. On Thursday and Friday, our team captains took over some of our tools and helped mentor them through building the subassembly. By their fourth match, they were able to score in the lower hub; due to the mechanism's efficiency, they ended up ranked quite high.

Community Impact When it comes to community impact, we firmly believe in quality over quantity. We focus on specific, targeted, sustainable initiatives. For the past three years, we've run and hosted workshops for Girl Scout troops to earn their Robotics, Programming, and Engineering badges. Our program, the first of its kind for 24,000 scouts in Western Ohio, has grown rapidly, and our offseason is packed with workshops for troops of all ages. We're also implementing our Badge in a Box initiative—we ship troops all the necessary materials and share instructional videos on the topics for each badge.

We partnered with the Boys and Girls Club, running and hosting a free, 4-week summer camp for underserved students. We designed the curriculum and walked students through learning OnShape, programming, and building LEGO robots. We are excited to grow that partnership into even larger and more impactful community impact initiatives this year. Looking forward, our Paul George STEM Learning Center will serve as a hub for local STEM education organizations; we've raised \$2 million of our \$3 million goal, and we're excited to continue working with local political leaders to make it a reality, sharing the scale model we built, and pitching the project to sponsors.;

