

FIRST Impact Award - Team 1138

2023 - Team 1138
Team Number
1138
Team Nickname
Eagle Engineering
Team Location
West Hills, CA - 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.
FIRST has had a profound impact on our team since its inception. 17 of our students have earned their CSWA, proving their expertise in CAD. Our seniors have a 100% graduation rate, bringing their FIRST skills to colleges such as Stanford and MIT. In 2022, our graduating seniors spent their summer at The NASA Robotics Academy, working on projects that could end up on the moon. Finally, many of our current mentors are former team members who went on into STEM fields because of their time in FRC.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Since our team is centered in Los Angeles, we are surrounded by a plethora of underserved communities, which we access through our students. Notably, our team welcomes neurodivergent individuals, and with them, we collaborated with We Rock the Spectrum and created the nation's first robotics program specifically geared towards children with Autism Spectrum Disorder. We've also established STEM programs with groups like the Armenian Youth Federation, Girl Scouts, and the Children's Institute Inc.
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?
Over the past two summers, our team and a few FIRST teams met with congresspeople to advocate for increased funding for afterschool STEM programs, especially in underserved communities. Our advocacy increased funding by over \$140 million through the ESSA and CHIPS Act, inspiring us to start a statewide organization, CASA, to impact California legislature. We measure our results by the impact we've made throughout our community, making sure that everyone receives equal opportunities.
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 works tirelessly spreading FIRST's mission globally. One of our members is the first high school student in Engineers Without Borders, a global organization of over 200,000 undergraduate and

graduate engineers. He works with UCLA to provide STEM education and clean, dependable water to the Bukonko community in Uganda. In the past, members have taught CAD to university students in Tanzania through E3 Empower Africa as well as taught underprivileged children in Taiwan English and coding.

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

We mentored rookie team 7650 from Switzerland, advising them through Skype calls and hosting them in their 1st USA tournament. That year, we also helped establish FTC team 6282, allowing them to transition from a small group working in a garage to a full-fledged team competing at league level, maintaining our relationship with them to this day. Additionally, we help out our fellow NASA house teams, specifically focusing on helping with innovating and programming swerve drives.

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?

At our school's yearly STEM summer camp, Team 1138 teaches robotics to 100+ K-8 students, many of whom later join the team and take on leadership roles. We've also hosted workshops for organizations like AYF, Girl Scouts, and MATES Elementary. We started a non-profit that teaches FRC teams about Autism and Applied Behavior Analysis, working with them to create robotics programs at Special Needs Centers. Numerous families have told us that our impact has changed their kids' lives for the better.

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

Support from our sponsors enables us to pursue our mission to provide opportunities in STEM to underserved communities, leading us to work with SASA to advocate for increased STEM funding. We've also partnered with We Rock The Spectrum, which is our top choice to host one of our programs through our nonprofit, Robotics For The Spectrum (RFTS). Additionally, we've partnered with institutions such as MATES, AYF, Girl Scouts, and CII, introducing them to robotics through workshops and courses.

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

Our team serves as a model on campus for equity and inclusion in the world of STEM in the hope to create a blueprint for a more equitable future. Our team co-founded CASA, an organization that uses advocacy to create robotics opportunities for underserved students in California. Additionally, to combat the lack of robotics opportunities for kids on the spectrum, we started a nonprofit that connects FRC teams with experts and special needs centers to expand our ASD friendly robotics curriculum.

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

Our team's sustained success in developing future leaders is ensured through strong ties among our members, graduates, and mentors. Our team fosters education through leadership, using a lieutenant system to maintain a steady transfer of knowledge, including our student-customized SolidWorks course. Additionally, our team utilizes resources such as Ryver, shared drives, and Monday.com not only to facilitate communication, but to teach organization skills to current and future students.

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

Our team maintains close connections with our sponsors, such as the Gene Haas Foundation, NASA JPL, and Comcast NBCUniversal. Our sponsors often arise through existing relationships with the team, resulting in close, personal interaction. In 2018, we became one of 12 (now 57) NASA house teams through JPL. To sustain and improve our connections with our sponsors, we write annual reports informing them of their impact on our team, along with sending thank-you letters, plaques, and updates.

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

As a team of 87 students, we often encounter divergent viewpoints while designing and making strategic decisions. We hold intensive discussions where anyone may contribute, regardless of rank, in order to value everyone's ideas and balance competing viewpoints. However, sometimes pride inhibits great ideas. To combat this, we've started converting members' advice into comments through a thorough peer-review process, building on one another and working together in design and strategy processes.

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

For us, inspiration starts with opportunity. We hope to increase funding for afterschool STEM activities nationwide through ESSA and the CHIPS Act at the National Advocacy Conference (NAC) as well as increasing it in California with CASA through ELOP, giving students in underserved communities a chance to participate in robotics. Also, we hope to expand our RFTS program to include teams and locations outside of California, so that kids on the spectrum nationwide can take part in robotics.

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.

As one of 57 members of NASA's Robotics Alliance Project, we often collaborate with high profile teams like 118 and 254 to improve the future of robotics engineering by helping less experienced teams with mechanical and software issues. We also take full advantage of our environment, actively recruiting talented artists from our school into our new animation subteam. These animators use their skills in a wider robotics context, teaching designers about the creative process and parallel workflow.

Essay

Eagle Engineering is the product of thousands of working hands and minds uniting under one common goal: to learn, build, and rise together. Starting in our hometown, Team 1138 has spread the message and values of FIRST to continents across the world, reaching communities untouched by STEM. For 20

years, we have passed down our motto, “We Build For a Better Tomorrow,” to an ever-changing student body. Our team works diligently to rise to unique perspectives, and by fostering a sense of empowerment and resilience, we have opened new opportunities for discovery, education, and innovation.

Our student-led team provides hands-on experience within an engaging environment, allowing members to join without prior experience and become capable leaders in engineering, business, design, and programming. The team has grown substantially over the years, expanding from just 5 people to over 80 diverse and passionate members. This has allowed new subteams to arise, such as our new Animation subteam, which won Best Theme for the 2022 Safety Animation Award. Our leadership structure enables students to rise up the ranks, starting out as a rookie, rising to lieutenant, becoming the leader of a subteam, and ultimately rising to be one of five team executives who manage team operations. Such a structure ensures the team’s sustainability: preparing students for the next year and allowing for a steady transfer of knowledge between generations.

Our team’s mission is to give underserved communities opportunities to learn robotics by expanding the impact of STEM education. We do this by providing avenues for learning, growth, and experience, giving these communities chances that they may not have had otherwise. Recognizing our access to resources, we seek to mobilize our assets both in our local community and across the nation.

Children with special needs are frequently barred from enrichment activities, resulting in them having less opportunities to learn about STEM and robotics. Seeking to combat this, in early 2020 our team partnered with the organization, We Rock the Spectrum, to design a unique, specialized program to provide children with Autism Spectrum Disorder the opportunity to build robots and engage in STEM.

Since this was the first program of its kind, we had to start from scratch. Using a Clawbot as the base of the curriculum, we methodically analyzed every step of the process and modified the instruction manual to signify places where helper assistance might be necessary. We also implemented tailored accommodations, such as our 2:1 teacher student ratio for struggling children. After working at the local and corporate levels for over a year, we finally launched our program in late 2021 and continue it to this day.

In order to broaden our impact, we founded a nonprofit, Robotics For The Spectrum (RFTS), to work with professionals and other teams to branch out and improve our curriculum. In November, we visited an off-season tournament and connected with 40+ teams, involving them in our mission and collaborating with a few of them to implement our program to their community. Since then, we’ve talked with over 50 teams, started 3 new programs in February, and have been constantly evolving to provide an optimal experience to all kids involved. To ensure effective communication and development of social skills, we’ve partnered with Board Certified Behavior Analysts to offer state-of-the-art Applied Behavior Analysis training to all volunteers. Additionally, we also changed our program from using Clawbots to using FLL kits, as their design is more flexible and customizable, allowing us to cover more topics at varying levels of difficulty and depth as we continue to develop our curriculum and extend its capabilities.

Our goal is to branch out of California and enable robotics teams across the world to establish our programs. Utilizing our team’s diversity, our multilingual members have begun translating our program into languages such as Armenian, Arabic, French, Spanish, and Chinese dialects in order to make our curriculum accessible for non-English speaking robotics teams who wish to establish our program in their home country. As we expand our program, we hope to create a world where all people, regardless of

neurological differences, are able to find equality through STEM.

Our mission to create more opportunities for underserved groups has inspired us to pursue change not just in our local community, but across the nation. In the summer of 2021, we partnered with the Student Association for STEM Advocacy (SASA) and participated in the National Advocacy Conference (NAC) to lobby our Congressmen for increased appropriations for Title 4 Part A in the Every Student Succeeds Act (ESSA), which allocates funding for after-school activities such as robotics for communities with limited access to resources. We continued our advocacy in the summer of 2022, flying all the way to Washington DC to advocate in person for both increased appropriations for Title 4 Part A of the ESSA and the United States Innovation and Competition Act (USICA). Thanks to our efforts, the House Appropriations Committee passed an increase of \$65 million in funding to Title 4 Part A of the ESSA, bringing its total to \$1.355 billion. Additionally, the CHIPS Act (USICA's successor) was also passed in late July, with Title III Section 10311 Part B allowing for the National Science Foundation to distribute grants to robotics teams, allowing for a potential funding increase up to \$9.5 billion.

Motivated by our work at the national level, we partnered with the other California teams we'd met at NAC 2022 and founded the California Association for STEM Advocacy (CASA), an organization to bring together California STEM organizations and guide them in advocacy, to host the California Advocacy Leadership Conference (CALC), the first California state-level advocacy conference for STEM, on January 21st and 22nd. Our goal was to teach these teams how to advocate, as well as guiding them to schedule meetings with their local representatives to advocate for increased appropriation to the Expanded Learning Opportunities Program. CALC was a huge success, having representation from over 30 organizations, including 20+ FRC teams, corporate representatives from FIRST California, FIRST Lego League, the REC Foundation, and the California State Government. We hope to one day have a representative from every California FIRST team at CALC.

Eagle Engineering strives to create opportunities for STEM education at our school any chance we get. Robotics is the future, and we consistently propose initiatives to our school administration, working with them to increase STEM activity. In the past few years, 1138 has inspired our school to implement a total of ten classes related to robotics, technology, and engineering. These classes range in teaching a variety of programs such as Python, Java, and C++, as well as teaching skills such as 3D modeling and other principles of engineering and technology. Additionally, by serving as a model for professionalism and dedication, our program led to the creation of a specialized STEM Lab on campus so that other students can learn the real-world skills that our team champions. Our team plays a central role in providing support to this new department by lending kits, offering tutoring, and creating tutorials.

We also work to empower the FIRST community directly. Four years ago, our team began mentoring and supporting Team 7650 from Switzerland, communicating with them digitally through online collaboration tools such as Skype and Ryver. By the end of the season, we hosted Team 7650 as they entered their first tournament in the US, where they won the Rookie All Star Award, qualifying them for Worlds. In 2019, we helped establish FTC team 6282 from Simi Valley High School. They started as a small group working in a garage, until our team mentored them, transforming them from just a few inexperienced students to an efficient, full-fledged team, even winning the Inspire Award. We volunteered at an FTC competition at Monrovia High School last year to continue allowing teams like 6282 to thrive and engage in healthy competition.

In addition to mentoring other FIRST teams, we also hold workshops for our local community. In early

2022, we hosted two workshops: one for the Armenian Youth Federation where we taught young Armenians the importance of STEM in a rapidly advancing world, and another for a local girl scout troop where we used FLL robots to help them earn their programming badges. We also participated in STEAM Day at MATES Charter Elementary in both 2022 and 2023 to teach youth about FRC and discuss all the skills championed in robotics.

As we continue to expand the scope of our impact to include forgotten communities, we plan to pick up old projects and take them to new heights. From 2018-2019, we organized and implemented robotics curriculums for Children's Institute Incorporated, an afterschool program for youth from troubled homes. Unfortunately, our local establishment lost funding, but now they are back and we are ready to resume our work with even greater enthusiasm. We are designing weekly interactive workshops where we will build robots while simultaneously teaching the children about the design process, programming, strategy, and collaboration. To do this, we are reaching out to other robotics teams across LA County to work with, ensuring that we have the resources and support we need to make this program a success.

Our commitment to rise above and lead in service and knowledge exemplifies our team motto: "We Build for a Better Tomorrow." As we expand our impact to underserved communities, we promote the importance of STEM to everyone we engage with, inspiring generations of innovators still to come. Through outreach, membership, and service, our once ambitious goal of spreading the mission of FIRST has now become a reality.;

