

Chairman's Award - Team 4159

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2022 - Team 4159

Team Number

4159

Team Nickname

CardinalBotics

Team Location

San Francisco, California - USA

Describe the impact of the *FIRST* 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 *FIRST* programs as mentors/sponsors.

Our student-led initiatives, such as the 7 year running Internal Robotics Competition, allow team members to gain machining, leadership and project management skills through hands-on learning. These experiences aid their success when pursuing higher education, as 100% of our alumni attend college, with 80% majoring in a STEM field. 8 of our alumni continue to share their experiences, setting up the next generation of Bay Area's FIRST students by mentoring 4 FRC teams in the past 3 years.

Describe your community along with how your team addresses its unique opportunities and circumstances.

We expand our diverse city's STEM opportunities by supporting events, partnering with 9 organizations with a goal of community impact, running 2 camps with UBER and a program for underserved youth, both over summer. Collaborations, such as our social event at Creator where we and 3 other SF FRC teams bonded over robot-made food, strengthen the SF FIRST network we've formed. To increase our local STEM space & help local FRC teams, we are funding and designing the construction of a building.

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 regard success as the effort and dedication our team puts towards inspiring young minds, which we track in our hours logged and events supported. From the past 3 years, we volunteered over 4000 hours supporting 25 FIRST events and more than 50 demos. We ensure our outreach work continues through our extensive documentation and maintenance of contacts. With our feedback system, we aim towards bettering the experience of participants based on their opinion of the event.

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 guiding philosophy is leading by example, with the ultimate goal of inspiring the FIRST community. Starting 2 FIRST teams, mentoring 15, assisting 14, creating tournaments with FUN and running & leading workshops with WRRF is how we lay the path for FIRST teams to blossom. Through hosting 6 annual FLL qualifiers, 8 FRC kickoff events and hosting the SF FRC Support Network since 2016, a Slack workspace with 13 teams, 4 joining in the past 18 months, we became the pillar of FIRST in SF.

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

Through our self-designed LEGO-based curricula, FLL stations at demos, work with middle schools, communication with event attendees and cooperation with SF public libraries, we've started 1 and mentored 8 FLL teams in the past 3 years. In the same timespan, we've run WRRF workshops, maintained a contact info page on our social media, hosted Kickoff events and worked with contacts to impact FRC by starting 1 team, mentoring 7 & assisting 12 and FTC by mentoring 1 team & assisting 2.

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 build platforms to increase access and interest in STEM, teaching applicable skills like design processes & problem-solving. Examples of this is in our collaboration with 8 school clubs to teach the wide range of STEM fields at middle schools and the engineering curriculum underrepresented middle & high schoolers at Aim High and Summer Bridge were taught. Our feedback showed us that 83% of Summer Bridge attendees are more inspired to pursue a STEM career.

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

2 year UBER & 1 year Aim High: Summer camps with VEX IQ & LEGO MINDSTORMS. IGNITE: 5 Women in STEM panels, 200+ students reached. SF Public Libraries: introduce FLL & FIRST Agricultural Institute of Marin: weekly demos at Farmers Markets. Creator: robot-made burgers & bonding with 3 SF FRC teams. Intuitive Surgical: leadership & management workshops. Studio Side Project: designing a STEM building. SF Independent Living Skills Program: STEM opportunities for foster youth aging out of the system.

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

In the past 3 years, 75% of our leadership has been female or non-binary members & 85% of our team are people of color. Through our WiSTEM panels' inspirational speakers & stories, we break down barriers and help female & non-binary students pursue STEM careers, with the most recent series seeing a 300% increase in attendance compared to our last. We raised \$450 in our first, annual Pride Month Fundraiser by selling 4159 Pride merch online, to support the SF LGBT Center and their initiatives.

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

We retain contacts, curate up-to-date leadership handbooks, hold workshops and encourage leadership in younger students to ensure our team will continue thriving. Our 7 year standing Internal Robotics Competition teaches invaluable technical skills to new members whilst secondary projects build their non-tech abilities. To pass down expertise, we preserve alumni relations through our weekly Build Season Mentor Reviews, social gatherings like potlucks and bonfires and the Pasta Dinner.

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

We forge sponsorships through grants, strengthening our ties with regular updates in newsletters, weekly videos, and highlights of funded projects resulting in 90% of sponsors supporting for 2+ years. We convey gratitude in Thank You letters, gifts, annual Pasta Dinner invites and engagement in initiatives like attending leadership workshops by Intuitive Surgical. Open CAD workshops, demos & Summer Bridge is how we retain our school's Alumni Association and Parent Teacher Student Association.

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

Our biggest issue is the pandemic's limitations on our opportunities such as training and in-person events. We modified our long lasting training efforts such as veteran projects, IRC & workshops to run remotely to ensure all members, especially rookies, get an equal chance at learning. Our lack of in-person opportunities led to lower motivation which we solved with weekly events & game nights and the Achievement System which gives members unique badges after achieving subteam specific goals.

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

Our team's goal is to spread FIRST, our love for outreach and the "more than robots" mentality far and wide. By helping create SFR, providing ? of the volunteers annually and giving tours to middle schoolers, we come closer to our goals. Since 2020, we've created 8 worldwide gaming tournaments with FUN, with 120+ teams & 300+ participants, later becoming the FGL. To spread FIRST globally, we have been in contact with Argentinian school officials and presented to our school's exchange students.

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.

Our team instantly adapted to the new environment the pandemic brought. We manufactured and donated face shields

for medical workers and first responders at the beginning of quarantine. Soon after, we hosted a competition to encourage youth to express their feelings through art to win prizes such as 3D printers & craft supplies. Understanding the FIRST community needed to stabilize in the post-pandemic world, we increased the amount of FRC teams we mentored by 250% and assisted by 400%.

Essay

Our Team's work with Partners & Sponsors, dedication to Breaking Down Barriers and Impact on FIRST is how we propel ourselves along with our community Into the Future.

Our Team

When STEM opportunities were rare, several ambitious students decided to create chances for themselves by starting Team 4159, one of the city's first robotics teams. We worked in the back of a physics classroom with limited resources but endless drive. Now the oldest SF team amidst a flourishing FIRST community, we build lasting educational impacts by developing leadership, independence and invaluable skills utilized beyond FIRST, with 80% of alumni pursuing a STEM degree.

Additionally, we promote diversity and equity - 85% of our team are racial minorities, and in the past 3 years we've maintained a balanced gender ratio while 75% of leadership positions have been held by female/non-binary members. The team covers transportation, food and lodging expenses so everyone can succeed regardless of socioeconomic background.

Partners & Sponsors

We strengthen our connection with sponsors to create unique opportunities otherwise unavailable for others in our community. To maintain such opportunities, we employ several methods to retain sponsorships.

Through engaging in our partners' initiatives, like attending leadership workshops held by Intuitive Surgical or the SF FRC bonding event hosted by Creator, we reinforce the future of our relationships. To convey our gratitude, we send "Thank You" letters and gifts, update them consistently through videos and newsletters and invite them to our 6 year standing annual Pasta Dinner, the last 3 years of which totaled more than 200 attendees.

We introduced UBER employee's children to LEGO MINDSTORMS & VEX IQ in the 2 annual summer camps we ran at UBER's headquarters in the past 3 years. Our self-designed curriculum taught valuable STEM and leadership skills through hands-on experience, unique activities and FLL missions, to more than 60 students. For our longest partnership, with Lowell High School, we've run public CAD workshops teaching students valuable engineering skills, 8th Grade Night presentations inspiring applicants, demos marketing robotics at Orientation Day and STEM fairs at middle schools through an 8 club collaboration all for strengthening our connection with the school. Through our partnership with the Agricultural Institute of Marin and the 7 weekly Farmers Market robotics demos we've supported so far, we've been bridging the divide between agriculture and STEM in our local community.

Breaking Down Barriers

As a team that's had to overcome underrepresentation in our own community, our outreach has focused on spreading opportunities to all, regardless of class, race, gender and sexual orientation.

To help combat underrepresentation in STEM, we introduced FIRST to 80 underserved incoming freshmen at our school's Summer Bridge program with interactive robot demos, CAD presentations, robot functions & design visualization lessons and marshmallow catapult design challenges. Through our feedback system, we found 83% of participants had a greater interest in STEM along with their ways of bettering the event. These responses gave us the ability to adjust our program's curriculum by adding activities relating to the non-technical aspects of the team, and for existing stations to be applicable to a wider range of skill levels. Simultaneously, we ran the robotics portion of a summer camp hosted by Aim High, a Bay Area organization that uplifts underprivileged youth. Aim High hosts their program at over 10 middle school locations, which we're planning to spread our self-designed VEX IQ curriculum to by working alongside Aim High staff in the classroom.

We've hosted annual WiSTEM Panels with Inspiring Girls Now In Technology (IGNITE) since 2017 to tackle the lack of encouragement for female/non-binary individuals to go into STEM. By inviting professionals to share their journeys and conduct Q&As, we aim to create an inclusive and welcoming community for those interested in STEM. Increased online presence and effective advertising during the pandemic raised awareness and accessibility for participants, increasing audience size 300% more than in 2020. To support the SF LGBT Center's youth services and initiatives, we raised \$450 through selling self-designed shirts in our Pride Month Fundraiser, which we're now continuing annually.

Impact on FIRST

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11 years ago, we were the only SF FRC team, which initially prevented us from growing. It now fuels our mission to ensure that no region is without opportunities, no event is unassisted and no team is left behind.

After helping to create the San Francisco Regional (SFR) 5 years ago, we continue our support by contributing a third of volunteers annually to ensure the competitions run smoothly. By hosting regular tours at SFR to middle schoolers, we show the endless opportunities that FIRST offers. Many of them go on to participate in FLL and FRC, with 3 joining our own team over the past 3 years. In 2016, we started the online Slack workspace called the SF Support Network to strengthen the growing local FRC community through streamlining communication between us all. Today we see the 13 teams in Slack asking & answering questions and collaborating on projects like practice fields & SF FRC shirts.

We've hosted our annual Kickoff event for 9 years, each time harboring teams from around the city who are strategizing and bonding over the new season. It's now a staple in the community, with SF FRC teams eager to come. Our 6 year standing FLL Qualifier, the only one in SF, has been a beacon of innovation, developing leadership and teamwork in all the competitors. For our hybrid FLL qualifier, we had activities such as a robot demo, a showcase of past FRC matches and a panel, all to encourage FLL students to continue their journey through the FIRST programs.

By regularly sending our members to volunteer at events across the Bay Area, we help teams have the best experience possible at competitions. Since 2019 we've supported 25+ FIRST events, pledging to sustain our unwavering support. Our team is also a major contributor in organizing the biannual WRRF workshops for youth in the Bay Area, which teach a variety of skills ranging from mechanical to fundraising. Through planning workshops & hosting panels, our efforts at these events have impacted 460+ FIRST students.

Frequent communication and involvement throughout the FIRST community allows us to elevate teams in need. We've mentored 5 FRC, 1 FTC, 13 FLL and assisted 6 FRC teams in the past 3 years. Through showcasing FIRST programs at demos and SFR tours, we started 1 FRC and 2 FLL teams. An example of our lasting impact is Team 5700, which we started from a demo at a local high school. Since their founding in 2016, we've consistently mentored and hosted their team at events like Creator and Kickoff. After a robbery, they were welcomed to our workshop and used our resources, ensuring a smooth Build Season despite hardship. Our mentorship helped them on their journey to become the first SF team to win SFR and a blue banner.

To launch FIRST on a global scale, we've contacted school officials in Argentina to help start FIRST teams, and worked with our school's exchange program to pitch FRC internationally. Although the pandemic has delayed these plans, we're actively communicating with our contacts to continue our work abroad.

With FIRST competitions cancelled during the pandemic, teams worldwide needed an outlet to invigorate their competitive spirit, so we created a globally accessible online gaming tournament. Partnering with FIRST Updates Now, we've hosted 8 online events, reaching 300+ people from more than 120 teams. Due to its universal popularity, these tournaments have transitioned into the FIRST Gaming League which, with our support, now offers more tournaments and a wider variety of video games to an increased audience.

Into the Future

For future success, we ensure all members have essential skills. Since 2014, we've held an annual Internal Robotics Competition (IRC), simulating FRC on a smaller scale. Rookies learn technical skills through hands-on participation and mentorship from veterans. Recently, we introduced secondary projects, teaching members skills in PR, outreach and graphic design. Workshop documentation, role handbooks and tool training videos are shared in our Google Drive for sustainability and passage of knowledge.

To eliminate prominent educational barriers, our team is working to provide STEM opportunities to foster youth. In collaboration with the SF Independent Living Skills Program, we plan to teach robotics to foster youth and give them the resources to succeed in STEM. We plan to connect similar foster youth programs to robotics, providing nationwide opportunities through the FRC network.

Furthering our goals to spread STEM to underrepresented groups, our team is partnering with Mission Bit, a nonprofit that hosts free computer science courses for underserved high school students. We're coordinating a workshop of our FRC bots that'll introduce youth to the robotics field with a focus on computer science.

Additionally, we're partnering with Studio Side Project to construct a building dedicated to STEM, featuring computer labs, maker spaces, an expanded shop and a practice field for local FRC teams. We're currently collecting funding for the feasibility study which will lead to assurance for investors and eventual construction.

From the only team in SF trying their best to survive to the pillar of a FIRST in a thriving community, we've been able to reach new heights each year pushing the team towards greatness one person at a time. Our Team's relationship with Partners & Sponsors, work Breaking Down Barriers and Impact on FIRST will only grow as we continue to look into the Future of our team and its boundless potential.