FIRST Impact Award - Team 1700

2024 - Team 1700

Team Number

1700

Team Nickname

Gatorbotics

Team Location

Palo Alto, CA - 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.

We are proud to report that 100% of our team attends four-year universities. Over 90% of Gatorbotics' members go on to major in a STEM or FIRST-related discipline. Gatorbotics leads members to cultivate a deep connection with the FIRST program, 1700's captain in 2014 has come to mentor us today. Furthermore, the vast majority of our alumnae currently work in a STEM field, while only 8% of STEM jobs are occupied by women, 80% of our Gatorbotics alumnae attending college are STEM majors.

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

Gatorbotics is proud to be an all-girls team, and 2/3 of the students impacted by our outreach program are girls. We feel very passionate about exposing young women to robotics, especially given that 80% of robotic engineers are male. For the past nine years, we've worked closely with the Halford Young Women Leaders' Program, which develops leadership competencies in under-resourced girls. Many Castilleja students who were once Halford "little sisters" currently participate in Gatorbotics.

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?

Gatorbotics has presented at the Palo Alto May Fete parade, Google engineering department, Castilleja School stories exposé, back to school night, and admissions events. We've shared our lab space and collaborated with other local FRC teams, such as through running practice competitions. Online, Gatorbotics has over 1,000 Instagram followers and several viral TikTok videos with 15k+ viewers. Through all of these efforts, we've exposed thousands to the work FRC and Gatorbotics does.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

In the last couple of years, Gatorbotics has made it a priority to share our curriculum from our outreach program called "Gear Up!", created to make STEM accessible to youth in low income communities. We've shared our curriculum with over 10 other FIRST teams, including other all girls teams like FRC

9008, allowing them to get involved in their communities. We strive to help all FIRST teams empower themselves through leadership.

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

In the past, Gatorbotics mentored five FLL teams within the Castilleja middle school, many of which won awards at regional competitions. The middle school unfortunately paused the program shortly before the pandemic and has since taken the program in a different direction more specific to female empowerment. However, we've also founded and mentored FLL teams with Street Code and KIPP School, both of which provide academic support and resources to students of color in low-income communities.

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?

In recent years, we began mentoring the newly-created Castilleja middle school robotics program. As a part of the program, we've taught 6-8th grade students to apply creativity, coding, and mechanization to create interactive robot animals comprising a "robot petting zoo." As a result of our efforts, 50% of new Gatorbotics freshmen participated in the program as 8th graders and thus far, 1/3 of the Castilleja middle school has participated in the program.

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 work closely with our sponsors, sending newsletters and building relationships that go beyond financial transactions. We invest in our school, presenting to young students and holding shadow days in the spring. Key to our mission is community partnerships: we teach robotics classes at the LEMO foundation, Peninsula Bridge, the Halford Program, and at Palo Alto libraries. Through these partnerships, we've introduced 850 students from underrepresented backgrounds to STEM in just five years.

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

Equality and inclusion on our team is incredibly important to Gatorbotics. In order to achieve this goal we ensure that all members are able to participate in all aspects of our team no matter their financial status. We provide free dinner at practice and during competitions we cover all travel fees for our members. In our community we work to spread our love for STEM through our "Gear Up" program, which focuses on reaching girls, students from low-income backgrounds, and students of color.

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

We understand that students only engage with our team as members for four years. Though our membership makeup changes year to year, our mission remains unchanging. Team leaders strive to impress the importance of our mission on younger members each year, so that when they are Seniors, they too take up the mantle of change. This focus on mission and impact, as well as our robust apprenticeship model, has allowed our team to run initiatives for years, seamlessly transitioning personnel.

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

After sending a potential new sponsor our comprehensive sponsorship packet, we set up an in-person sponsorship pitch. We offer companies a virtual tour of our Lab and provide them with free merchandise displaying their logo. Our sponsors have the opportunity to communicate with our team members about company internship opportunities, giving them the chance to recruit the next generation of robotics leaders. In order to keep sponsors engaged, we send them our team newsletter updates each month.

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

Five years ago, our team had 14 students. This year, we're 70 students, which is 30% of our high school. It has been challenging to adapt to our rapid growth, as we want to maintain a small-team feel among our now large team. As a result, we've increased the number of hours team members can practice, so there are fewer team members in the Lab at once, allowing for individualized learning opportunities. Simultaneously, we offer fun, monthly, all-team team bonding and weekly all-team meetings.

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

At its core, FIRST aims to produce innovators in robotics, foster mentorship, and develop leadership competencies and technical skills. Gatorbotics truly embodies that mission, on our team and in our community. While team members are passionate about their technical team's work, spending countless hours working on our robot, they're also passionate about sharing that love. Even during the postseason, Gatorbotics members led three robotics summer camps, discussed in the essay below.

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.

We pride ourselves on the fact that we are a completely student-run, student-led team. Our team structure allows second-year members to immediately take on leadership roles. This incentive of cultivating initiative creates an environment where students have more access to leadership opportunities, automatically uplifting the confidence of young girls to pursue not only STEM in the future, but additionally dare to be bold leaders in FIRST-related initiatives.

Judge Feedback

Who/When	Feedback
	What were the particularly compelling parts of our Impact Award Submission, and how can we improve our Impact Award candidacy in the future? **An area the team has an opportunity to improve.** **Something that really impressed the judges.**

Essay

In December of 2004, Team 1700, "Gatorbotics", began in a 10' x 11' closet at Castilleja School, an all-girls middle and high school in Palo Alto, California. Just twelve girls spent hundreds of hours building a robot on top of two knee-high desks. The focus and dedication our team members possess has not

waned in the 19 years since Gatorbotics' inception; our passion has only grown stronger.

Today, Gatorbotics continues to live by the mission statement established by our founding team members: to diversify the world of STEM by empowering the next generation of learners and leaders. We have pursued our mission with a three pronged strategy, which includes building a strong educational robotics program to compete in the FIRST Robotics Competition (FRC), promoting robotics, engineering, and computer science throughout our school community, and empowering young girls and other underrepresented groups in our local community through STEM partnerships.

Building an Educational FRC Team:

Gatorbotics is entirely student-led and student-run, which is essential to our philosophy of building confidence in STEM and leadership. Our team prioritizes promoting a sense of initiative from the beginning of each members' robotics journey, encouraging leadership from all members. Our thoughtful, new-member centered approach equips all members with the skills and knowledge necessary to think creatively and critically in a STEM space.

At Gatorbotics, we're passionate about expanding the definition of a "STEM student." Our inclusive mission has driven our 350% membership increase in the past 5 years (20 students to 70 students). We attract students from different backgrounds with diverse skills and interests because we promote the idea of personal authenticity on the team. From a young age, girls are told their STEM potential is limited, but we challenge that narrative by encouraging everyone to show up authentically and bring their whole self to our team. Having our own team members in leadership positions inspires younger members to ask questions and get involved. Our philosophy is centered around providing a space in which girls can learn from one another, lead with confidence, and build a supportive community.

Promoting STEM at our school:

Since 2005, Gatorbotics has worked to expand the breadth of Castilleja's STEM opportunities. Our members have advocated successfully for the school to create a Computer Science and Engineering (CSE) department, ensuring that our classmates also have the opportunity to learn the foundational technical skills Gatorbotics develops. In 2017, we founded three FLL teams at our middle school and continued to mentor them through the pandemic. With a lack of LEGO resources available during the pandemic, in 2021, we shifted our involvement to teaching our own middle school robotics class, called the Gatorbots. The Gatorbots focus on STEM concepts through interactive projects. Our mission for teaching and spreading STEM is reflected within our members, as many serve as mentors for the middle school robotics program. Many Gatorbots alumni join Gatorbotics upon joining upper school.

Empowering our larger community through STEM Partnerships

At the heart of our mission is focusing on empowering the next generation of STEM leaders, which we accomplish through our "Gear Up!" program. We launched our Gear Up! initiative just over five years ago to introduce engineering and robotics concepts to as many students from groups underrepresented in STEM as possible. While "gearing up" refers to increasing speed in engineering, it also means to prepare for one's future. Our team believes that having a fundamental understanding of computer science and mechanical engineering is critical, especially with the advent of new technology in the decades to come. Since the inception of Gear Up!, we have worked directly with over 850 young girls, low-income students,

and students of color—helping them find their place in the world of engineering.

In January of 2019 while looking to expand our impact beyond our campus, we discovered that the high cost of LEGO robotic parts was a prohibitive barrier to many of our partner organizations. Seeking to engage with organizations that did not have the funding or technical resources to begin FLL teams, we shifted our focus to the creation of an accessible, low-cost robotics curriculum, which is at the heart of Gear Up! Throughout 2019, we designed our STEM curriculum and piloted teaching through pop-up classes at our local libraries.

In 2020, just as our Gear Up! classes were gaining momentum, the COVID19 lockdown shut down the Palo Alto libraries and school systems, bringing STEM education to a halt. With many schools, especially in under-resourced communities, struggling to transition to a distance-learning model during the pandemic, Gatorbotics launched its first long term Gear Up! class in partnership with Curieus, an organization that aims to increase representation in STEM by offering science experiments for kids in low-income areas.

Gatorbotics' members shifted our hands-on curriculum to a virtual model where each lesson plan tackled a specific aspect of engineering. One hundred local students signed up to take our weekly, virtual Gear Up! class, where we covered topics like prototyping, electronics, coding, CAD, fundraising, branding, and more. Enrollment and class materials were completely free of charge, ensuring that anyone had the opportunity to sign up, due in part to the fundraising that we had accomplished that season. With a 1:6 teacher:student ratio, participating students received the individualized attention they lacked on Zoom and gained diverse mentors who demonstrated a passion for STEM. The parent feedback we received at the end of the program further demonstrated that the Gear Up! class was a huge success. One parent shared, "[her son] loved all of it! Each class seemed to be different, using different supplies and he was engaged throughout...He didn't enjoy having to leave!"

Energized by the success of our first Gear Up! partnership class, we worked to expand our program and adapt our curriculum for in-person teaching in the fall of 2021. We consolidated our virtual STEM lessons into a project based curriculum which takes students through the same design process we use in our FRC build each season. Our younger students (age 6-10) follow our “Designing for a Purpose” program. They interview a partner, identify a challenge their partner faces, brainstorm solutions for the challenge they identified, build a prototype of one design out of recyclable materials, and finally present their solution. Our older students (age 11-13) follow our more technical “Designing for Change” curriculum, which involves identifying a climate change related issue in their community and designing a solution. Both curriculums are summarized in our publicly available Design Journals, which serve as interactive workbooks for the projects.

Our curriculum is specially designed to not only introduce engineering and design principles, but also instill foundational life skills such as interviewing, giving and receiving feedback, problem solving, presentational speaking skills, and empathy. As an all-girls team, we are too familiar with our voices being silenced or overlooked in technical spaces, so we are incredibly motivated to ensure our students are also practicing resilience and developing confidence in their own abilities. For the majority of our students, Gear Up! is their first experience with engineering, and our greatest hope is that we are able to demystify a subject which often feels intimidating and exclusive.

In the spring of 2022, we began our partnership with three additional local organizations: the LEMO

Foundation, The Halford Young Women Leaders' Program, and Peninsula Bridge.

The LEMO Foundation aims to support low-income student-athletes in all aspects of their lives, from athletics, to technology, to philosophy. During the summer of 2022, we taught our “Designing for a Purpose” curriculum to a LEMO summer camp for K-5 graders. Over the six week camp, we mentored over 150 students through their first design project, helping them get excited about engineering for the first time. We also led LEMO Sophie's Scholars, 50 6th-8th grade scholarship students at a local private middle school, through our “Designing for Change” curriculum. Students addressed climate change by designing interactive robots and presenting their projects at a symposium to hundreds of community members. We returned to LEMO in the summer of 2023, teaching both of our programs to another 200 students.

Team 1700 has also partnered with the Halford Young Women Leaders' Program since 2021, or Halford for short. The organization aims to build confidence and social-emotional skills among high-achieving, low-income 4th-5th grade girls living in East Palo Alto. Recognizing the confidence gap, Gatorbotics mentors have focused on incorporating leadership competencies throughout the “Designing for Change” curriculum with our 80 Halford students.

Lastly, we have worked extensively with the Peninsula Bridge summer program since 2022. Like Halford, Peninsula Bridge supports students from underserved communities academically and personally, starting in the 4th grade. In the summers of 2022 and 2023, Gatorbotics members taught a five week “Designing for Change” course to 120 ten-year-old girls from low-income backgrounds. At the end of the summer, their eyes shone with excitement as they proudly presented their cardboard creations, empowering vehicles of change. Our classes have been so successful that the Peninsula Bridge organization has adopted our curriculum into their year-long science courses with several hundred more students throughout the bay.

At Gatorbotics, we’re mission grounded and impact driven. We’re gearing up the next generation of STEM leaders to change the world.

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