FIRST Impact Award - Team 2073

2024 - Team 2073

Team Number

2073

Team Nickname

EagleForce

Team Location

Elk Grove, 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.

Participating in FIRST gives our team members opportunities to try, develop a passion for, and ultimately pursue STEM beyond high school. Our students use team experience to practice programming, machining, designing, and business skills. In the last three years alone, 95% of our graduating members have pursued post-secondary education, with 87% pursuing a STEM profession. Of our team's alumni, 32% continue to volunteer at FIRST events. Team 2073 further inspired 4 alumni to return as mentors.

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

There is a lack of STEM programs for students with special needs in our community and school district. To address this, we developed an adaptive engineering program that provides robotics and physics lessons for special education students. Under the guidance of their teachers and parents, we ensure that our lessons are easily understood. We also created ScoutReach, a curriculum for local Scouts BSA Troops to help them earn their Robotics merit badge, one that requires specific robotics support.

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 researched and designed STEM kits with 5 affordable EagleActivities to create EagleKits. By distributing EagleKits to our outreach attendees, we can extend our STEM impact past a single event by encouraging engagement at home. From 2021-2023, we distributed 304 EagleKits and 262 EagleActivities, all measured by comparing the number of EagleKits prior and after an outreach event, and within the first two months of 2024, we have already distributed nearly 100 EagleKits.

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 supports the pipeline created from FLL to FRC. As FRC students, we serve as role models to guide younger students through this pipeline. We organized and hosted the only Sacramento FLL Qualifiers in 2022 and 2023. At these tournaments, we held a Q&A session and offered shop tours for

over 230 FLL students to expose them to key FRC and robotics concepts. Additionally, we volunteered and hosted the NorCal District Championship in 2024.

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

Through competitions and shop tours, we utilize our resources and knowledge to assist other FIRST teams. Last season, an FTC team visited our shop for a tour where we shared programming knowledge and discussed managing business and outreach initiatives. Our assistance reaches out to FRC teams as well: during Capital City Classic, we machined spare parts for other teams. Before our FRC competitions, we contact international teams to offer any materials or tools they might need.

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?

Through our robotics summer camps, EagleCourse, we teach technical concepts to younger students and provide shop tours as well. In an anonymous survey, over 90% of our campers in 2023 stated EagleCourse made them more interested in STEM, and students on our team joined because they were previously campers. Shop tours are also part of our STEM initiative for GATE programs in our school district, which allows each program to choose their level of STEM engagement from robot demo to project.

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

Our team co-hosts an offseason competition, Capital City Classic, with Teams 3859 Wolfpack Robotics & 1678 Citrus Circuits, that offers workshops providing teams with competition experience. This year, we hosted 42 teams and 19 workshops. For our district’s GATE program, we created a level-based initiative that allowed each school to choose their level of STEM engagement. This year, while sharing our shop with IDEA, we fixed a cold-cut saw and 2 lathes which are frequently used in classes.

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

We assist Girl Scouts through our ScoutReach program, with a curriculum created by us to aid their robotics badge journeys. By exploring various machines and fundamental robotics concepts, Girl Scouts enhance their STEM knowledge. They also obtain an opportunity to drive our robot firsthand, experiencing a real-life application of STEM. Additionally regarding our partnership with IDEA, we furthered our diversity by participating in a Girls in STEM event, reaching out to 25 students.

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

Our Outreach subteam has a student-made curriculum that teaches communication with other businesses and member recruitment for outreach events. Additionally, we document how to effectively plan and manage events using a shared team drive. Newer members are also assigned to shadow older members on the Outreach subteam, learning how to fulfill their role to continue and improve the team’s outreach initiatives.

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

Our sponsorship pamphlet and formal letters include budget breakdowns, past accomplishments, and future plans for sponsors to view where their money will be allocated towards. We ensure retainment by sending thank you letters and appreciating them in our social media platforms and merchandise. At our Burgers and Bots fundraiser showcase last year, we invited all sponsors out to attend. We engaged with them through entertaining robotics activities, such as robot demos and a scavenger hunt.

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

Our team needs to improve on member recruitment strategies to further expand operations in both technical and business aspects and address the graduation of veteran members who take up almost half of our team. To assist with this effort, we began inviting students to our team from our feeder middle school to train their machining, designing, programming, and business skills early on and give exposure to the FRC competition and build environment.

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

With FIRST as the foundation for inspiration, EagleForce wants to demonstrate to students, families, friends, and communities that FIRST is more than just robotics. The most prominent evidence of our progress towards this mission is our efforts in involving and engaging more students in our outreach initiatives. Our team used to be only about building competitive robots, but now we strive to inspire others by providing STEM experiences, allowing them to branch into various STEM futures.

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.

During this offseason, we worked on an outreach robot with four “modules” that could be switched, so we could demo future FRC games without building a new robot. On our “Modbot,” we plan on building an elevator, intake with a shooter, arm module, and a t-shirt cannon. Our goal for this project is to provide interactive robot demos that are more fun than the usual shooters or manipulators, inspiring younger students to join the FIRST community and pursue robotics post-secondary.

Judge Feedback

Who/When	Feedback
Mar 15, 2024 07:11:47 PM EST	**Is Impact feedback from previous years still available?** **An area the team has an opportunity to improve.** **Something that really impressed the judges.**

Essay

An Eagle’s Care

Our team exemplifies an eagle. We see communities to watch over them through STEM experiences, swoop in for the assist, and soar with our community to new heights. We are Team 2073 EagleForce, founded in 2007 at Pleasant Grove High School in Elk Grove, California. A group of 7 dedicated students began our team and since then we have grown to a team of over 40 active members. Our mechanical, programming, and business subteams grew to now include both strategy and outreach subteams. We keep a keen eye on not just our local community, but beyond Sacramento, and through EagleKits, we sustain our impact in homes too. The action of an eagle “seeing” or watching over its baby birds correlates to indirect help, similarly to how we indirectly help nearby communities through EagleKits. EagleKits are free, STEM activity kits (EagleActivities are individual activities) each containing five affordable activities meant to incentivise learning after outreach events. From lava lamps to catapults, EagleKits teach students STEM concepts while providing a means for creativity. Outreach events, shop tours, and elementary schools are all just some of the outlets for EagleKits and EagleActivities, reaching about 500 people since their inception in 2021. Alongside the EagleKits distributed during elementary school demos, we reach out to specific elementary students who participate in GATE (Gifted And Talented Education). Our shop tours with GATE and a “STEM Night” we created for Loomis led to over 100 GATE students exposed to STEM over this past year. We also attend events hosted by our sponsors to showcase our seasonal robot and spread STEM into local companies. One sponsor, ECMC Foundation, hosted a grant-appreciation event where we presented our robot to them and other grant recipients. Regarding our oldest sponsor, Kiwanis Club of Rancho Murieta, and their annual family expo, we demoed our robot to show STEM for diverse audiences. We furthered the diversity of our audience by participating in a Girls in STEM event. By demoing our robot and discussing our FIRST experiences, we offered 25 students unique STEM opportunities and inspired them to pursue FIRST. Beyond Girls in STEM, we engage local Boy and Girl Scouts through ScoutReach, created in 2022. For ScoutReach we researched and created our own curriculum for their robotics badges, teaching engineering and programming concepts. Scouts define a problem to solve and prototype a solution, encouraging firsthand STEM experiences through various resources, including VEX IQ bots. Our assistance towards robotics badges reached over 40 Scouts. We highlighted a feedback form to help improve the program, and those who responded reported having further interest in STEM because of our program. To increase efficiency, we established a ScoutReach scheduling calendar on our website for easy accessibility and information about available dates. In a similar vein to ScoutReach, our team in 2023 implemented a curriculum specifically for special needs students under the guidance of credentialed teachers, resulting in CAP (Connect-Assist-Play). We teach physics, mechatronics, and basic technical concepts using interactive activities and simple lessons. We hosted a pilot session to gauge the interest and accessibility of our activities. After this pilot session, we received feedback from parents and a supervising special education teacher to improve the program. We applied this feedback by further catering our lessons and activities to the capabilities of special needs students. Our CAP curriculum guides students on a process similar to how our team constructs robots. Identical to an eagle swooping to gather food for the growth of its young, we swoop down on organizations in our community who need assistance and provide new opportunities to them. Besides addressing the lack of STEM education for special needs students, we expanded STEM education opportunities to our local community through our robotics summer camp, EagleCourse. Since its inception in 2018, our team members are counselors and provide lessons and individual assistance for 4th-8th grade students. We guide campers through a robot building process for 5 days, utilizing VEX IQ bots to resemble assembly and programming processes. EagleCourse takes students who may know little STEM knowledge, teaches them basic mechanical and programming concepts, and challenges them to test their skills in friendly and fun competitions. Our team also applied machine literacy skills gained from FRC to fix and maintain tools in the workshop we share with our school’s Engineering CTE (Career Technical Education) pathway, IDEA (Innovative Design and Engineering

Academy). We fixed a lathe after a leak occurred from a damaged gasket and performed maintenance on the other to avoid issues regarding IDEA's curriculum. Additionally, our team purchased a metal saw blade for a cold cut saw, which is commonly used during classes to cut metal stock. With router knowledge from running a 4x8, we assembled a 3x2 wood router our school ordered for IDEA. Beyond this, we fixed both CNC mills after one remained broken for about 3 years. We are helping IDEA's engineering teachers consider integrating CNC machinery into the IDEA curriculum. We showcase this machinery during shop tours which educates students on STEM and FRC. Students use their experience to detail a portion of the design process and students leave knowing the entire process of how we design robots. For example, a CAD team member can explain the process of using Autodesk Inventor to design a robot. The introductory portions of shop tours include showing our robot reveal and CAD which is often our visitors' first view into FRC and captivates them. After showing what we design we show how we design. We explain our prototyping process before showcasing our woodshop and laser cutters. Afterwards, our machinists showcase their respective machines. All this builds towards the final result: a demo of our robot. Our team acknowledges the privilege of using a shop with high-end machinery so we strive to share this experience with our community whenever possible. We often include shop tours in any outreach event using our shop, especially during FLL. Like eagles using fierce storm winds to soar above a storm, our team used the inaccessibility of FLL tournaments in our area of Norcal to host FLL competitions and promote FIRST. Since 2014, we have run and hosted yearly FLL tournaments to fulfill a lack of FLL events. Most recently, we hosted the Capital District FLL Championship in February and a Qualifying Tournament in November 2023. In 2022, our Norcal FLL Qualifiers brought such high demand we increased the tournament capacity from 18 to 24 teams. During the qualifying competition we hosted last year, 24 teams competed, one of four tournaments out of 18 to do so, and 36 teams competed at the Capital District FLL Championship. Alongside competition, we demo our robot and offer shop tours and information via Q&A sessions to build further interest in FIRST. By hosting important events, like Championships, we encourage FLL students to continue down the FIRST pipeline to FRC. In the past 4 years, 5 students joined our team from FLL teams, 3 of which became team leaders. In addition to FLL, our team co-hosts an FRC offseason competition, Capital City Classic (CCC), with Teams 3859 Wolfpack Robotics and 1678 Citrus Circuits. Since the competition began in 2014, we grew from inviting 15 teams to hosting 42 teams. During CCC, we hold workshops where attendees can learn about topics relevant to competition, build season, and the workforce. To add to the repertoire of our competition, our team participated in a joint presentation with Citrus Circuits on scouting app development; and in 2023, we hosted a workshop on videography. Additionally, we recruited an industry professional from NASA to present on the Artemis Space Mission. Our team strives to make CCC an accessible and collaborative environment where FRC members can receive knowledge from experienced students on various topics, like establishing team branding or starting a camp program, like EagleCourse. We leverage the supportive CCC environment to invite all our team sponsors and donors to show their efforts into our team. Beyond furthering our sponsor relationships with invitations, we held a fundraiser showcase, Burgers and Bots. Kiwanis began sponsoring our team in 2007, and they helped sell desserts and cook the burgers at the event. To incentivise ticket sales, the students who sold the most tickets could pie a mentor of their choosing, leading to nearly 350 tickets sold. Besides dinner, the event consisted of a scavenger hunt to teach visitors about FIRST and subteam roles on the team. We also demoed multiple robots to advertise CCC and educate people thoroughly despite the bigger crowd. This ties into the most important aspect of this event: interacting with our community and showing younger students the pipeline to FRC through our team. Caring for the pipeline to FRC in our community through the outreach events, competitions, and shop tours culminated in over 1,000 hours of outreach for our team. This care allowed 87% of our alumni to pursue industries in the STEM field. Care, alongside our three years of experience and resources, impacted over 2,000 individuals in our community. Our team strives to see inequalities in

STEM accessibility, swoop in to physically improve STEM institutions, and soar as a community, better appreciating the value of STEM through the conduit of FIRST. ;