

Chairman's Award - Team 2468

Team Number
2468
Team Name, Corporate/University Sponsors
NXP/Intel/Qualcomm/National Instruments/Berry Consultants/Pixels and Verbs, LLC/NASA/BAE Systems/Westlake & Eanes Science & Technology Association/SolidWorks/FIRST in Texas/Texas Workforce Commission/Eanes Independent School District/Westlake High School PTO & Westlake H S
Briefly describe the impact of the FIRST program on team participants with special emphasis on the 2016/2017 year and the preceding two to five years
"Team members tend to stick around and see the excellence that continues with the program and are proud to call themselves alumni" (David Weiser, 2468 Alum). "The things I learned [from 2468] helped set me apart from other students here at Georgia Tech.", said alum Akash Thaker, who also interned at DEKA. Team members have interned at NASA, Apple, GE, Samsung, Rockwell Automation, Tokyo Electron, SpaceX, and more. At our last banquet, 30-40 alumni attended, representing 9 of our 10 years.
Describe the impact of the FIRST program on your community with special emphasis on the 2016/2017 year and the preceding two to five years
STEMConnect introduced 485 students to STEM in the last 3 years and provided materials to middle-school robotics classes and day camps to mentor young girls in building, programming and strategy. "For their inspiration, guidance, and general awesomeness, we truly appreciate Team Appreciate!" (FLL 13202, Robosaders). We teach interactive STEM lessons and demo robots to spark interest in STEM at our 6 elementary schools and local events like TEDx, the Governor's Inaugural Parade and F1 FanFest.
Team's innovative or creative method to spread the FIRST message
We created FIRST Signing Day to recognize graduating seniors and recruited 8 other FIRST teams to participate in #FIRSTSigningDay. "We are so thankful that Team Appreciate recognizes the importance of promoting STEM." (Cathy Schulz, FRC 1538). A team member spoke about FIRST in the DVD extras for Transformers: Age of Extinction. We host monthly girls lunches to build a community and a sense of belonging among the girls in robotics—letting other girls know there's a place for them.
Describe examples of how your team members act as role models and inspire other FIRST team members to emulate
SACOT provided other FIRST students the opportunity to meet with 34 legislators and have a voice in STEM education. After attending the 1st Annual SACOT conference, FTC 5628 "saw real potential in improving the funding and conditions of their program through SACOT's initiative." Among our team members are Dean's List Finalists, Eagle Scouts, a Gold Award recipient and class valedictorians. 44 of our students and alumni are now Certified SolidWorks Associates, and 5 have LabVIEW certification.
Describe the team's initiatives to help start or form other FRC teams
For 2 years, we mentored 7 Chinese rookie teams before the CRC competition. 6028 said our work "helped [them] greatly at [their] first regional, especially given [their] limited knowledge of English." This year, we'll host a Chinese team at our campus before the Alamo Regional for the 2nd time. Although not competing, we'll send 10 students to the Alamo Regional to help 6028, 6377, and others. We loan robots to local teams so they gain robot knowledge pre-season.
Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)
We started 5 FLL & 14 FTC teams, and of these, we continue to mentor 3 FLL and 7 FTC teams by providing access to our shop, critiquing presentations, and more. We interact with the classes offered at our feeder schools to cultivate interest in STEM while building a pipeline to our FRC program. "Team Appreciate offered to help start an FTC team back home. My goal is to give as many students in Germany the opportunity to experience this amazing competition."—Exchange Student Max Krass, FTC 10796.
Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

We developed products for AndyMark and VEX; beta tested the roboRIO, LabView, and more for NI and FIRST; and regularly host and volunteer at Jr. FLL/FLL/FTC/FRC tournaments. We provide handouts, make videos and host seminars on topics such as sensor integration, the road to Rookie All-Star Award, strategy and Chairman's. Our R&D subteam beta-released CROMA, an outreach management application with tools for event planning, media storage, and archiving for FIRST teams.

Describe how your team works with other *FIRST* teams to serve as mentors to younger or less experienced *FIRST* teams (includes Jr.FLL, FLL, FTC, & FRC teams)

We mentored 10+ FLL teams, 9 FTC teams (1 in South Korea, 1 in Germany), and 12 FRC teams (7 from China, 1 in Israel) and hosted BatBots—a student-led competition like an FRC build season—including rookie team 6377. "The inspiration to develop and fund the Texas Active Rookie Partnership (TARP) grant originated with a conversation [with 2468]...Your ideas, observations and feedback are important to everyone at FIRST."—Patrick Felty, Alamo RD.

Describe your Corporate/University Sponsors

Sponsors provide funds (NI, BAE, Qualcomm), mentorship (NXP, Intel, Qualcomm, NI, Pixels & Verbs) and software (SolidWorks, NI). Concurrent Design Firm assists with design review, while Lowe's donates materials to our Lilypad Project. Internships at Berry Consultants and Silicon Labs provide students with valuable experiences and connections; messaging systems (such as Slack) improve the team's communication/management; and NI mentorship improves our LabVIEW programming capabilities.

Describe the strength of your partnership with your sponsors with special emphasis on the 2016/2017 year and the preceding two to five years

"Intel Austin offered their first two paid high-school internships to 2468 students. This greatly impacted the company's attitude, expanding our recruiting efforts." (Hiren Majmudar, VP). We built a "Marathon Bot" for the Freescale Austin Marathon, raising awareness and funds for FIRST in Texas. In subsequent years, Freescale involved other teams and significantly increased sponsorship of FIRST teams. With STEMConnect, employees work while their kids participate in an enriching summer activity.

Describe how your team would explain what *FIRST* is to someone who has never heard of it

"FIRST is a program that brings excitement and real-world STEM applications into a competitive sports-like environment" (Jake Cooper, 2468 Alum). While we learn to build robots, we also gain skills valuable both in engineering and life, such as collaboration, design, communication and manufacturing. Most importantly, it's a place for students to be themselves. "I never found a sport I could succeed at, but 2468 acted as both a team and a family to me."—Michael Keim, 2468 Alum.

Briefly describe other matters of interest to the *FIRST* judges, if any

Goals: • Obtain official promotion by FIRST of FIRST Signing Day • Recruit every FTC/FRC team in Texas into SACOT • Recruit a rookie FRC team annually • Qualify for TARP Grant annually, sharing funds with rookie team • Expand STEMConnect corporate & district models • Use portion of AndyMark royalty credit to purchase chassis for rookies • Increase fundraising; every student pitches to a company • Build rainy-day fund • Establish 2nd FRC team mentored by alumni • Fund additional space for our program

Team Captain/Student Representative that has double-checked this submission.

Shrey Majmudar

Essay

TEN YEARS

Tools break. Students graduate. Facilities change. Over ten years, our team has defined and dedicated itself to a very simple mission: to inspire future STEM leaders worldwide through mentorship, political advocacy, service, and lifelong learning. We accomplish this mission by looking for ways to continually improve our community and our students. Since 2007, FRC 2468 Team Appreciate has grown from 35 students struggling to build a functional robot into a thriving STEM hub. As a veteran team, we make it a priority to be available to others and share opportunities with those who otherwise wouldn't have them. In the spirit of sustainability, we lead a variety of initiatives, each with its own unique impact. Whether it's a shop tour, video call or trip across the world, our efforts focus on representing the FIRST ideals and building passion and excitement for STEM culture.

FORMING

Although we're a stronger team now, our first five years were somewhat chaotic. At home, we were troubled by technical issues and low enrollment. At tournaments, our goal was simply to score. To fill our program with better prepared

students, we created a pipeline for grades 6-12 in our school district. As part of this pipeline, we formed 15 teams at our feeder schools and 7 FTC teams at our high school. Interest in robotics created demand for a rigorous STEM curriculum. Both middle schools in our district now teach basic programming to every student and offer robotics as an elective, leading into a high-school curriculum serving 200+ students. Over 90 educators from 25 districts approached us about emulating our model. We mentored 33 FIRST teams, providing technical feedback, funding and shop access. Helping fellow teams at competitions is a 2468 norm; at every regional we attend, we dedicate a group of students to helping less-prepared teams improve their robots.

Our efforts to support FIRST teams transcends national borders, reaching teams in Germany, Israel, China and South Korea. For 2 years, we participated in the China Robotics Challenge, and back at home, we held video calls, created a Chinese-English dictionary of FIRST terms and hosted workshops for them before the Alamo Regional. We also developed unique products that benefit other teams. Our simple swerve-drive design, VersaSwerve, is on the VEX website, and our affordable string potentiometer sells on AndyMark (1000+ units in 3 years). Our R&D division, Chap Research, developed the FRC ChapR, an adaptation of our patented Bluetooth remote for FTC. Chap Research also released CROMA, a web application to revolutionize outreach documentation. Through product development, we expose our students to industry, helping them obtain 49 professional certificates in SolidWorks/LabVIEW and 19+ years worth of internships.

We advocated FIRST and demoed our robots at 220+ community events in the past 5 years, including Dell Family Day, Maker Faire, NI Week, and the Design Automation Conference. Often, we are invited to return, allowing us to involve other teams. One year we attended the Freescale Technology Forum; the next, we included 11 other teams in this event. Our program often receives media coverage, such as interviews with CBS and Fox, articles in Sparkfun and ROBOT magazine, and radio ads.

Our team's structure allows students of all backgrounds, experiences and interests to contribute and feel valued, forming lifelong skills. This learning process begins with our mindset of student empowerment, where team members make decisions alongside industry mentors. After learning technical skills like CAD, programming, electronics and machining, many of our students receive paid internships at companies like Silicon Labs, National Instruments, Intel, VEX and NXP. Our team allows students to engage in non-technical activities like fundraising, entrepreneurship and PR. Team members also develop communication and collaboration skills that help them handle projects in parallel and coordinate between subteams.

REACHING

With our STEM networks in place, we sought larger audiences to further spread the FIRST message. We developed relationships within the FIRST community through sharing ideas, forming connections, and having fun. As our program grew, our cramped classroom-shop was insufficient for the 150+ robotics students at our school. To alleviate this strain, our program actively supported a \$52.5M bond proposal for our school district with \$7M allocated for a robotics facility. Our students spent many hours campaigning by speaking at school board meetings, lobbying door-to-door, and writing to local newspapers. The bond passed, bringing new facilities that tripled our space.

In 2013, we were the first Texas team to attend the FIRST National Advocacy Conference (NAC) in Washington, D.C., gaining experience to start our own political advocacy program at the state level. In addition, we created an ongoing dialogue with dozens of legislators about bills (SB1177 and ESSA) for providing supplemental funds for STEM programs. We then hosted 4 federal legislators at our school.

Essay - page 2

NAC inspired us to start the STEM Advocacy Conference of Texas (SACOT) that gives high-school students a voice in their STEM education. In October, we hosted the Founders Conference at the Texas Capitol. Over 80 students from 12 teams met with 12 legislators to introduce SACOT. Afterwards, our students finalized the SACOT platform containing the legislative agenda, school board initiative, and corporate connection program. SACOT's general membership increased to 350+. In January, with sponsorship from FIRST in Texas, we hosted the 2017 SACOT Annual Conference at the start of the Texas legislative session. 50 attendees from 10 teams held 22 legislative meetings to spread awareness of the partnership between UIL/FIRST and promote HB395, a bill to increase funding for Technology Application Courses like robotics.

Reaching beyond our STEM networks, we pioneered the Lilypad Project, which provides hand-painted attachments for IV poles. Kids sit on "lilypad" platforms while their parents walk them down hospital halls. In the past year, we cut, hand-painted and delivered 40+ liliypads to 4 hospitals. This year, corporate donations provided for an additional 50+ liliypads, helping us continue our tradition of donating liliypads to a hospital near every regional we attend.

INSPIRING

Today, we strive to inspire every student we come in contact with. A priority for our program is the involvement of a previously under-represented part of our community: girls. Three years ago we started an annual day-long mock competition, where we introduce 90+ girls to the exciting atmosphere of FLL/FTC. This, plus student-parent contact and grade-school exhibitions, let us create and mentor 3 all-girl teams (2 FLL, 1 FTC). Girls in our program serve as leaders and role models for younger girls who may be hesitant to try robotics. In the past 5 years, the number of girls on our FRC team has increased by a factor of 8; our roster is now 35% female.

In line with our mission to make STEM activities more accessible, we developed STEMConnect, a series of week-long STEM education programs offered to the children of our sponsors' employees. Held on corporate campuses, STEMConnect strengthens our connections with companies like NXP, Intel, and Qualcomm. Enrollment has skyrocketed from 24 students in 2012, to 175 in 2015, to a projected 350+ in 2017. Kids inspired by STEMConnect formed 4 FLL teams, 2 of which are all-girl teams. STEMConnect's success motivated our team to expand the model to our school district, and this past summer, we hosted 3 sessions for 60 kids. STEMConnect proceeds let us donate over \$30K worth of resources to our middle schools. In the last 3 years, teams in states such as California and Arizona, and back home in Texas, have adopted our STEMConnect model.

Over the past 2 years, we adapted STEMConnect for underserved kids by partnering with Breakthrough, a non-profit organization providing guidance for first-generation college students. We helped Breakthrough integrate our curriculum into their summer program, assisting their interns in teaching the material and lending them our kits; this partnership has already impacted 125+ students.

Having witnessed the outstanding effort put forth by our team members, we felt that all FIRST students deserved more recognition from their communities. We created FIRST Signing Day, a national initiative where seniors in FIRST sign a letter of intent, inspired by the tradition observed by sports teams and athletes across the nation. This allows schools and local communities to celebrate their students while spreading the word through social media platforms. Last year, we held our inaugural FIRST Signing Day with 8 teams participating across the nation, and this year, we plan to spread this event across FIRST.

CONCLUSION

In 2007, we couldn't have even imagined the things we've now accomplished. As we celebrate our 10th anniversary, we're more determined than ever to continue our mission of inspiring STEM leaders worldwide by adhering to FIRST values and providing new opportunities to future generations of FIRST students. Being a successful robotics team is important to us, but even more important is paying it forward so others can have the same learning experience. Ten years ago we never realized the team we would become. Now, we're looking forward to seeing the team we WILL become.