

Chairman's Award - Team 1678

[Print](#)[Close](#)

2019 - Team 1678

Team Number

1678

Team Name, Corporate/University Sponsors

UCD Chancellor's Office/Davis Joint Unified School District/NVIDIA/Markforged/Innovation FIRST International/Apple/UCD School of Medicine/UCD College of Agriculture and Environmental Science/UCD School of Biological Sciences/First Street Realty/UCD College of Engineering/Hill Engineering/DMG Mori/UCD College of Letters and Science/UCD Global Affairs/Fastenal/Martin's Metals/Aerometals/M. Cubed/Sunpower/Greenbotics/Bright Funds Foundation/West Coast Products/Da Vinci Boosters/Far Western/UCD Pre-College Program/Solidworks/West Yost&Davis Senior High

Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the 2018/2019 year and the preceding two to five years

Since 2013, 1678 has grown from 21 to 90 members. Every student is trained by older students, creating sustainable leaders each year. Over the last 4 years, students used their communication skills in 3780 hours mentoring Davis Youth Robotics (DYR) teams. 11% of our students came from DYR. Of our 130 alumni, 87% have attended university, with 85% of those in STEM majors. Those who didn't attend university went straight into STEM careers, like the local SunPower company or the military.

Describe the impact of the *FIRST* program on your community with special emphasis on the 2018/2019 year and the preceding two to five years

Over the last 3 years, 288 campers have attended DYR RoboCamps, run by 81 1678 students across 2800 volunteer hours. We inspired 270 girls at the all-girls science camp Tech Trek at UCD. Our booth at the local Farmer's Market teaches thousands of people per year about FIRST. We implemented the local Shelter Finder webapp, working with 10 PD officers to find 50 available spaces for our homeless community in 2017-18. This year we trained 85 people from 3 different organizations to use the webapp.

Team's innovative or creative method to spread the *FIRST* message

Our integration of tech into welfare with Shelter Finder uses FIRST knowledge to help solve real-world issues. Shelter Finder is expanding throughout our local area, including Woodland and Sacramento. The Compass Alliance (TCA) broke new ground as a collection of team resources, 34 created by 1678. TCA is accessible and effective, guiding teams from rookie to self-sustaining. With FIRST's endorsement and 4 available languages, TCA is the vehicle of FIRST's message to those who need help.

Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

We are a resource for teams at competitions. In 2017, this effort was coined Citrus Service (CS), reaching 162 FRC teams in the past 2 years. In 2018, the CA Regional Director invited us to the Silicon Valley Regional for the sole purpose of conducting CS. We were invited to China where students spent a week helping rookie Chinese teams. At Houston Championships, our Battery Loan program provided 41 teams with 124 robot batteries. We worked with Team 125 to do the same at Detroit Championships.

Describe the team's initiatives to help start or form other FRC teams

We created and support 3 FRC teams: 5458 Digital Minds (2015), 6174 Kaprekar's Constants (2016), and Team 7229 Electronic Eagles (2018). We helped 5458 fundraise to travel to 2015 and 2017 Champs (Hopper Division Finalists). Every weekend of 2018, CS members helped 7229 at our shop. With our support, 6174 won Capital City Classic in offseason 2016. We recruited members and guided 7229 in building their kit bot, leading them to the Sacramento Regional Highest Rookie Seed (2018).

Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)

We started DYR with one team in 2013. We grew to 7 DYR teams in 2014, 16 in 2015, and 27 in 2016 and 2017. In the 2018 season, we had 31 DYR teams with over 300 students. Nearly every DYR team is mentored by a 1678 student, and every 1678 student assists in at least 1 of 3 DYR League competitions. Thus far, 1678 has donated \$18,500+ of our DYR RoboCamp funds to give 74 kits to 7 DYR League teams, 5 elementary schools, and 3 middle schools, impacting 170+ kids.

Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

Students who start in our DYR program as elementary school students often join 1678 once they reach high school. Our team hosts 11 events each year for the DYR program and dedicates 4000+ hours/yr to sharing robotics with kids. 1678 has helped 3 FRC teams start youth robotics programs (2073, 5458, 6174). We also mentored the first FTC team in Davis, members who moved on to join 1678. In total, 1678 has assisted over 300 FRC teams at competitions.

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)

With Team 3250 we judged at a Jr. FLL competition (2017). In 2016, we provided remote support to the first Vietnamese FRC team, Team 6520. For the past 4 years, we have co-hosted the offseason event Capital City Classic with FRC Teams 2073 and 3859 where we have held 64+ Fall Workshops. In addition to the 1,875 attendees, we have reached 38.5K people with our online recordings. 1678's mentors have worked in Australia, China, and Hawaii to guide beginner and veteran FRC teams (2016-2018).

Describe your Corporate/University Sponsors

Our strong relationship with Davis Joint Unified School District (DJUSD) resulted in a STEM facility on campus, where our team builds our robot, hosts RoboCamps, and educates 500+ students in the first-ever DJUSD robotics curriculum. UC Davis, a core sponsor since 2011, supports us in developing Shelter Finder and helps us start STEM programs in Argentina and China. NVIDIA allowed us to test and give feedback on their Jetson TX1 code technology, and we proudly display their logo on our trailer.

Describe the strength of your partnership with your sponsors with special emphasis on the 2018/2019 year and the preceding two to five years

We invite every sponsor to our facility during our Sponsor Open House after stop build day and to the Sacramento Regional. We create personalized videos for our major sponsors, visually showing their impact on our program. Our oldest sponsor, Technip FMC, gave us industrial safety training. We participate in the planning of the Sac Regional, hosted by our sponsor UC Davis. Any student without a competition role volunteers. In DJUSD facilities, we host DYR competitions funded by RoboCamp profits.

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

FIRST is a robotics program that empowers students globally: it teaches not only technical skills, but also interpersonal skills that aid students in becoming leaders, communicators, and innovators of tomorrow. Among these skills, students in a FIRST program learn to emulate coopertition (cooperation in competition) and gracious professionalism in a competitive, fast-paced setting. FIRST is a platform where students become the powerhouse behind a more innovative, sustainable future.

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

We ran a Women in STEM seminar (2015-17) and expanded to Diversity in STEM in 2018. WiSTEM had a total of 150 attendees and the first DiSTEM event had 35. In 2018 RoboCamps, we included an all-girls week, led by female 1678 members. We donated \$17,000 from the DYR RoboCamps to district robotics classes (2017) and \$20,000 to create the Willett Elementary Makerspace (2018). Invited by NorCal Regional Director, we showcased FIRST to 8k+ people at the Capital California Airshow (2017-18).

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

Maya Brandy

Essay

Team 1678 Citrus Circuits does not just follow FIRST's vision of transforming the culture of STEM—we embody that vision by educating our students, empowering our peers, and excelling in our team endeavors. Since our start in a classroom and shipping container, we have exponentially expanded our facilities, programs, and global impact. Along with our success in competition, we have a wide range of programs that introduce others to STEM, find shelters for the homeless, aid fellow FRC teams at competition, and more. These programs give us the means to achieve the goals within our motto: Educate, Empower, Excel.

Our team's impactful programs, student involvement, and community visibility allow sponsors to form strategic partnerships with us. In return for financial support from organizations like the Yolo County Office of Education, UC Davis (UCD), Davis Joint Unified School District (DJUSD), and NVIDIA, we support their programs with our resources: helping DJUSD develop a new makerspace at Willett Elementary School with a \$20,000 donation, creating opportunities for UCD to integrate their Medical Center with our Shelter Finder project, and testing NVIDIA's Jetson code processing systems. At our Sponsor Open House, sponsors are the first to see our robot after build season and interact with the students who built it. Sponsor partnerships form the cornerstones of our team development.

We educate.

Education begins with our team structure: a combination of student involvement and mentor support. The responsibility for training recruits, building the robot, and coordinating outreach events rests upon students, creating a sustainable system that cultivates new leaders each year. With 96 members and a 7:1 student-to-mentor ratio, we maintain this educational cycle by having our veterans teach newer students to become innovators and communicators fit to take on leadership roles.

We leverage the offseason event we co-host, Capital City Classic, to run our Fall Workshops (FW) and educate the attending FRC teams. This year, 925 FW attendees (40% more than 2017) listened to our presentations and participated in our active discussions on 20+ topics. Each workshop is posted online to reach the global FRC community, collecting 38,500 views so far. In 2018, we livestreamed FW for the first time, giving viewing access to those unable to attend in person. Each year we make these presentations more accessible, educational, and applicable across the world.

In summer 2018, we traveled to Hangzhou to participate in Robotics Championship China (RCC) and teach robotics engineering to pre-rookie Chinese teams. During the competition, we spent 10 hours a day guiding pre-rookie Chinese students in building their first drivebase from the FIRST Kit of Parts. Other team members actively helped other teams or volunteered at the event. Expanding on RCC, we are working with FIRST Australia to grow our impact in China by organizing a return trip to teach English and basic engineering in the low-income area of Wuping next summer. Of the 70+ students we will educate, many have never been involved in FIRST before.

Since 2015, we have presented annually at the international Mentors Without Borders Conference, hosted by Hall of Fame Team 3132. There, we work with FRC teams from rural Australia, furthering our team's initiative of inspiring the world through FIRST education. This year, 125 Australians from 15 teams, including 5 pre-rookies, learned team management and build season strategies.

Our Davis Youth Robotics (DYR) program comprises three branches that aim to educate and introduce robotics to young community members. The first, DYR schools, brings robotics to students by engaging them in open-ended design and programming challenges at no cost. Over 168 students participated in 3 classes in middle schools and 6 in elementary schools. Our 3 high school classes provide CTE credit to the 300+ students who have enrolled in the past 4 years. We loaned 4 robot kits to Team 6174 to help them integrate hands-on robotics, inspired by FIRST, into school curricula.

We empower.

The second branch of DYR, DYR League, directly introduces STEM into our general community through monthly fall competitions. During the 2018 League season, 200+ children from 30 teams participated in DYR League. In 2018 alone, 41 1678 student mentors were trained to foster critical thinking, teamwork, and project management skills within their DYR teams.

The third branch, RoboCamps, is divided by audience: beginners, experienced, and programmers. Over the course of each week, campers design, build, program, and compete with their robots. From RoboCamps' inception 3 years ago, we have seen tremendous growth, tripling the number of weeks (6), campers (144), and student counselors (31). We ran our first-ever all-girls week this year, with a team of 8 female student counselors working with 24 girls. We helped Teams 5458 and 2073 start their own RoboCamps by training their counselors and loaning them guidebooks, fields, and game objects.

Essay - page 2

We expanded our outreach and supported our partners' programs through the creation of our non-profit organization, Davis Robotics Foundation (DRF). DRF is a fiscal host for Teams 5458, 6174, and 7229, helping them accept sponsor donations. Through DRF, we offered 16 full scholarships to low-income students in DYR League and RoboCamps, a value of \$3,800 per year.

Our Diversity in STEM (DiSTEM) program expanded from our Women in STEM Seminar and encourages young girls to see STEM as an option for their future. Starting in 2015, we held seminars for the community by inviting prominent women in STEM careers to speak. This year, we changed the format to be more engaging and less one-sided: 35 girls spent 2 hours experimenting, driving robots, and problem-solving at our first Girl Powered event. Next year, we will further expand DiSTEM to underrepresented groups by bringing STEM to the Yolo County Housing Migrant Center and local Child Development Centers.

Being a part of 1678 empowers our students to grow into leaders and communicators pursuing careers in STEM, designing prototype hardware for stroke detection, and developing self-driving trucks. Our alumni's innovations are clear uses of 1678's iterative engineering process. James Schimek, a 1678 alumnus, now teaches a middle school robotics course as part of our DYR program. Many of our alumni stay involved in FIRST after leaving the team: our alumni mentor 14 other FRC teams.

Our Shelter Finder website, a student-developed web application that tracks empty beds in homeless shelters, empowers the Davis Police Department (DPD) to help those in need. Up from 10 last year, in 2018 our students taught 24 DPD officers, 43 shelter volunteers, and 18 emergency room staff to use the app. The app was used 50 times in 2017, and we are working with our sponsor UCD to expand to nearby Woodland and Sacramento, as well as train more first responders to use this life-saving app.

We excel.

We support the three local teams we started—5458 Digital Minds (2015), 6174 Kaprekar's Constants (2016), and 7229 Electronic Eagles (2018)—to excel competitively every year. We invite them to our practice and real Kickoff, analyze the game together, share our facilities, and donate spare parts and tools. With our support, 5458 reached the finals in the 2017 Hopper division as the first pick and 7229 won Highest Rookie Seed at their first competition in 2018.

We have co-hosted the annual offseason competition Capital City Classic (CCC) with FRC Teams 3859 and 2073 for the past four years. This year, we worked with DJUSD to hold CCC on our own campus. 86 students on our team (70% of all volunteers) ensured the event was a success for the 45 FRC teams attending. All 3 of the teams we started attended this event, where we continued our in-person support.

We formalized Citrus Service (CS) in 2017 to help teams enjoy events and excel competitively by sending our students to work with them in the pits to install parts, troubleshoot issues, and test mechanisms. In 2018, CS provided technical knowledge to 115 teams, up from 47 in 2017. We were personally invited by the CA Regional Director to the 2018 Silicon Valley Regional to assist all the teams attending.

Another CS initiative, our first-ever Battery Loan program, provided batteries to international teams at the 2018 Houston World Championship who could not bring them abroad. We and 13 other FRC teams provided 41 teams with 124 batteries. We collaborated with Team 125 to expand this program to the Detroit World Championship.

We are a founding member of The Compass Alliance (TCA), a global, FIRST-endorsed program that is the "One-Stop Shop" for teams seeking assistance. FIRST HQ uses the resources we created as a way to promote FRC team growth. Their most recent blog post (2/4/19) includes our step-by-step guide on registering students in the Youth Registration System. TCA consists of written and videotaped resources, virtual mentor-matching, and a chat center available to every FRC team. Our students wrote and revamped 34 of the 68 documents in the TCA website's repository. As a member of the leadership team, we organize translating documents and our website into Spanish, Turkish, and Mandarin and direct the program's growth planning at every TCA meeting. TCA will continue to grow with FIRST's support and our team's innovative approach to helping other teams excel.

We use the values of FIRST, integrated into our core motto, to generate excitement for STEM. By educating our communities, empowering our peers, and excelling at what we do, we act as a role model locally and internationally. We believe the world of technology is constantly changing, so our programs continually evolve to reach farther, impact deeper, and innovate further. Team 1678 will keep making real-world change because we educate, we empower, and we excel.