

FIRST Impact Award - Team 1678

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| 2025 - Team 1678 |
| Team Number |
| 1678 |
| Team Nickname |
| Citrus Circuits |
| Team Location |
| Davis, CA - USA |
| Describe the impact of the <i>FIRST</i> program on team participants within the last 3 years. Think about percentages of those graduating high school, attending college, in STEM careers, leadership skills, and serving as mentors/sponsors in <i>FIRST</i> programs. |
| -Leadership: Leadership positions acquired via peer-to-peer team structure (28 subteam/outreach leads yearly) result in refined management & soft skills; 2 Dean's List Finalists-Mentorship: 20% of mentors are 1678 alumni-Work experience: 29 students obtained internships at local STEM companies-Technical: 103 members receive training on lathe, mill, & CNC router, w/ opportunities to earn Haas certification-Future: 100% graduate high school, 95% attend university, 85% pursue STEM majors/careers |
| Describe your community along with its unique opportunities and circumstances. Think about your geographic region, diversity of town/school, language barriers, socioeconomic barriers, and cultural expectations. |
| 1678 operates out of Davis, CA, a university town in a large agricultural region. We leverage our town's relationship between STEM & agriculture to bring robotics to neighboring underserved communities i.e. Dixon, where only 15% of residents have bachelor's degrees. Our proximity to UC Davis & its research facilities allow students to tour & intern at local labs. UCD also acts as a magnet for innovation, attracting firms that provide 1678 students w/ internships to build crop-picking robots |
| Describe the team's methods, with emphasis on the past 3 years, for spreading the <i>FIRST</i> Mission in ways that are effective, scalable, sustainable, and creative. |
| 1678 creates opportunities in STEM through the expansion of our signature program, Davis Youth Robotics (DYR):-1,982 participants-Summer camps doubled capacity to underserved communities (8 to 16 weeks) & now includes grades K-3 -Added 3 schools to free after-school robotics program in 2025, reaching all 9 elementary schools in Davis-Increased from 5 to 9 yearly tournaments, opening spots for more teams-58% of 1678 members are DYR alumni; DYR is staffed by 1678 members & funds itself & the team |
| Describe your team's goals and the progress you have made towards them to fulfill <i>FIRST's</i> Vision. |
| 1678's goal is to support the discovery of STEM in underrepresented groups:-16% of engineers are women, Women in STEM Empowerment (WiSE) was formed by female 1678 students to engage more girls in STEM activities-Neurodivergent kids are often overlooked; this year, 1678 took initiative to become the California Director of Unified Robotics, a STEM program for neurodiverse kids-DYR was created to fill a lack of robotics opportunities in Davis; now it expands to neighboring underserved communities |

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| <p>What impact has your team seen from your efforts described in the above question? How does your team measure impact?</p> |
| <p>1678 measures impact through the tangible change we make:-WiSE: participants increased from 24 in 2018 to 211 in 2024; 90 WiSE participants & their families attended the Sacramento Regional (2023); expanded to 3 underserved communities-Unified Robotics: 100% of participants expressed actionable interest in joining 1678 next year; this program resulted in financial support by UCD for its continuation-DYR: 3,700+ students have participated in our signature program; 58% of our team are DYR alumni</p> |
| <p>Please provide specific examples of how your team and team members act as role models within the <i>FIRST</i> community with emphasis on the past 3 years. How do you share these best practices with other teams?</p> |
| <p>-1678 was invited to speak & provide 7 workshops at conferences on topics from Effective Student Leadership Development (2024 NE FIRST conference) to Supporting Students w/ Autism in Engineering Pathways-Citrus Service: trained 7 FRC teams to begin their own service stations-Online Resources posted yearly (e.g. Scouting Whitepapers featured on FIRST website, CAD, code, team handbook, Fall Workshops)-Shared our successful Robocamps handbook w/ 200 organizations, including 150+ FIRST teams</p> |
| <p>Describe your team's initiatives to Assist, Mentor, and/or Start other <i>FIRST</i> teams with emphasis on activities within the past 3 years.</p> |
| <p>-Citrus Service: Provided technical guidance & support to 636 teams on 2,237 instances at competitions since 2022-Cohost offseason event yearly w/ teams 2073, 3859, 5270, 701 & provided Fall Workshops for 45 attending teams-New Facility: 21 teams utilized our full field & shop to refine robots w/ 1678 technical aid; Week 0 Scrimmage for 9 local teams-Assisted 17 teams on topics: technical, outreach, awards-2024 Provided 3-day workshop in Monterrey Mexico for 7 FIRST teams representing 31 teams</p> |
| <p>What other initiatives have you created, grown, sustained, or participated in (<i>FIRST</i> or otherwise) to help inspire young people to be science and technology leaders and innovators? What outcomes have you seen from your efforts in the past 3 years?</p> |
| <p>1678 provides opportunities for girls to be future STEM leaders:-WiSE: Spread WiSE events to 3 neighboring underserved communities impacting 71 girls; collaborated w/ team 5458 to help them start their own WiSE program-Girl Scouts: Led 24 Girl Scouts on FIRST competition tours in partnership w/ team 2073; hosted a Brownie workshop which introduced FIRST to 47 Girl Scouts. Integrated STEM into youth culture by leading 115 girls to earn Robotics badges via 1678's FIRST & STEM tours + workshops</p> |
| <p>Describe the partnerships and relationships that you've created with other organizations (teams, sponsors, educational institutions, government, philanthropic entities, etc.) and what you have accomplished together, with emphasis on the past 3 years.</p> |
| <p>-Grant earned in partnership w/ Davis Joint Unified School District (DJUSD) & CA Dept of Ed. to construct a full-field facility that serves as an FRC Hub for FIRST teams, includes machine shop (students receive Haas CNC machine certifications)-FIRST HQ: Invited to coordinate a multi-team technical support alliance modeled off of Citrus Service at 2025 World Championships; created worksheets for 2023 Kit of Parts-Asked by FIRST to create scouting whitepapers, published on FIRST website in 2024</p> |
| <p>Describe your team's efforts in the past 3 years to promote equity, diversity, and inclusion within your team, <i>FIRST</i>, and your communities.</p> |
| <p>1678 has ongoing initiatives promoting DEI:-WiSE, see Q's 4 & 5 above-Citrus for Change: show our solidarity for: LGBTQ+, trans rights, AAPI, BLM, etc. by selling special-edition merch & donating profits (\$1,725) to local charities-Within team:-Team leadership: 60% female in 2025-2 female/nonbinary bonding nights yearly-Recruitment tour of the 1678 shop for middle school girls in 2024-FIRST:-Gold tier partner for LGBTQ+ of FIRST; hosted 3 meetups, 2 w/ team 1967-Organized 2 FIRST Ladies meetups</p> |

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| Explain how you ensure your team and the initiatives you have created will be sustainable. | |
| 1678 maintains sustainability by ensuring the availability of essential resources:-Peer-to-peer team structure fosters cycle of knowledge within team-Strong community & parent support-Student run youth programs create a direct pipeline to team 1678 & fund 40% of team’s budget-Long standing sponsor relationships: Schilling Robotics (21yrs), TechnipFMC (16yrs), UCD (13yrs), DJUSD (10yrs), Lockheed Martin (6yrs)-Sponsor Retention Program: advertising, personalized gifts & communication, Open House | |
| Highlight one area in which your team needs to improve and describe the steps actively being taken to make those improvements. | |
| To address inefficient and ineffective workplace practices, 1678 implemented new sustainable systems & procedures:-Evergreen Initiative: detailed documentation to be updated yearly for future leads w/ step-by-step processes, things to avoid & best practices-Structured approach to organization (5S: Sort, Set in Order, Shine, Standardize, Sustain) to reduce waste while increasing productivity & quality-Specific, Measurable, Achievable, Relevant, & Time Bound (SMART) goals set for all programs | |
| Briefly describe other matters of interest to the <i>FIRST</i> 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, particularly noteworthy, or had a large impact. | |
| -New sponsorship: Sacramento Kings NBA team; collaborating to bring robotics opportunities to underserved youth in Winters & Fairfield-1678 hosted & organized Kickoff for Sacramento area teams for the past 5 years-Provided volunteers at official FRC competitions & NorCal FLL Explore Festival & Sacramento FLL Regional-Established partnership w/ the Center for Information Technology Research in the Interest of Society, gaining funds for outreach & opportunities for WiSE girls to tour UCD labs | |
| Judge Feedback | |
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| | <div>What aspect of our submission do you find most impactful and why? An area the team has an opportunity to improve. Something that really impressed the judges.</div> |
| Essay | |
| <p>How does a circuit light the way forward? We are the Citrus Circuits, and we know that in today’s world, a step in the dark leads nowhere. Thus, our mission was formed: to shine the light of opportunity—through sustainable, accessible, and engaging programs for everyone. To achieve this, we have created a vast circuit spanning FIRST and the world, a conduit by which our energy flows. All circuits need a power source. Ours is a LIME, representing our team as we educate, empower, and illuminate the path to excellence.</p> <p>A circuit requires a strong foundation. Ours is Davis CA, an agriculturally-based college town. The heart of Davis is our farmers market. Created by the joint effort of farmers, our city, and UC Davis; the Davis Farmers Market embodies the alliance of agriculture and STEM—an alliance that has proven vital to 1678. Our first program, selling light bulbs, began in 2013. After all these years, we still set up our booth every Saturday—not to sell lightbulbs, but to immerse the youth in our community with robots, gearboxes, and programming challenges. This initial effort led us to the present, where by showcasing FIRST to over 2,000 people weekly, we inspire young minds to step into STEM with Davis Youth Robotics (DYR).</p> <p>A circuit’s energy spreads throughout its components. Our lime surges its electricity into the circuit, splitting into 3 distinct branches of DYR: RoboCamps, League, and Schools; providing opportunity to 721 youth this year alone.</p> | |

Each program creates a pipeline to FRC and 1678, and uniquely fulfills our community's need for robotics education.

A circuit's current can travel anywhere, as long as it has a path. The lime has surged its electricity into the underserved community of Dixon, an agricultural town where only 15% of adults have a Bachelor's degree. Due to the lack of STEM opportunities there, we established RoboCamps—a summer program originating in Davis where students collaborate to build and compete with robots. In 2024, we revised and updated our RoboCamp Administrative Guide, a seminal tool used by 200+ organizations, including 150 FRC and FTC teams from 6 continents. In addition to grades 4-8, 1678 expanded the age range of students we serve by offering 2 additional weeks of programming tailored to kids grades K-3. Team 1678 ensures that all campers can participate—1 in 12 receive a scholarship.

A circuit surges with an increase in power. Every fall, our circuit becomes supercharged as 1678's reach expands across Northern California through DYR League, exciting students to compete. This fall, 1678 hosted 5 student-run DYR events. In these tournaments, 175+ teams compete to qualify for both state and world championships. One coach from the Bay Area marveled, "The 1678 volunteers deserve special recognition. Their enthusiasm, knowledge, and willingness to help at every turn reflect the high standards of the program. They make every participant feel supported and valued." Over the past 3 years, 1678 members have spent over 5,715 hours (238 days) working with 69 DYR teams throughout Davis. To support underserved or low-resourced students in their STEM journey, 1678 members donated \$5,500+ for supplies and scholarships. Thanks to the countless hours spent organizing tournaments and mentoring across Davis, 1678 has both expanded and improved one of our most impactful programs.

A circuit is more efficient with lower resistance. The DYR Schools program offers a free, engaging, after-school opportunity that energizes passions for STEM through hands-on robotics experiences for 150+ elementary school students. 1678 student mentors support teachers during work sessions and help students learn how to design, build, code, and operate robots for competitions. Historically, we matched DYR kits 1:1, but this year, we supplied kits and fields, which allowed DYR to expand to all 9 elementary schools in our district, including a Title 1 school. To accommodate the increase in participating schools and students, we've expanded the end-of-year tournaments from 1 to 3. DYR Schools has lowered the resistance between youth and STEM through free and accessible robotics, energizing elementary students today to be innovators tomorrow.

A circuit can be transformed to create new paths. Through our Women in STEM Empowerment (WiSE) program, we educate and inspire young girls in grades 3-8. As our female 1678 members guide them through various STEM activities, such as making lava lamps or forming dry ice bubbles, we act as role models to the next generation. "As a young girl, I looked up to the female leaders at WiSE events. Later, I became one of those leaders; and eventually earned the WiSE lead position in 2022," Jasmine, a current subteam lead, remarked. In 2023, we expanded our WiSE program to local communities in Dixon and Fairfield, and hosted specialized events like our Python programming workshop. The impact of our WiSE program inspired team 5458 to reach out for assistance in starting their own WiSE events in 2024. We collaborated with them in running their first WiSE event, and now they lead their own. As young girls engage in our programs, we activate the switch that connects them to a world of STEM—60% of 1678's leadership in 2025 is female.

A circuit's energy flows for a purpose. With our school district as our partner, 1678 developed 4 levels of robotics classes inspired by the FIRST program. These accredited classes serve the purpose of allowing students to explore a wide range of topics instead of specializing as they would on 1678. Open to students in grades 7-12, they are part of the Career Technical Education robotics engineering pathway. In addition to undergoing machine tool certification, the students work in teams to learn about the design process, how to build robots, and how to use advanced tools such as Computer-Aided Design and Python programming; ultimately gaining hard and soft skills that can be transferred directly to the workplace.

A circuit cannot function without all its parts. Unified Robotics ensures no one is left out. In this program,

neurodiverse students work together to build robots over the span of 6 weeks to tackle a set challenge. Teams designed, built, and programmed robots using LEGO Education Kits, supported by a unique 1:1 student-mentor ratio. In 2024, 1678 became the California Regional Director of Unified Robotics, bringing this inclusive program to the state. Anya, one of our seven counselors, grew up caring for her paralyzed sister, who also had a learning disability. She knew firsthand how often students like her sister were overlooked. After joining 1678, she became Unified's photographer—watching students grow in confidence, discover their passions, and find where they belong. By the end, Anya was determined to lead Unified herself and ensure no one was left out.

Our circuit reaches beyond borders. In fall 2024 our team was invited to Monterrey, Mexico to provide a technical workshop for 7 Prepatec High School FRC teams at the invitation of coordinator, Paco Travino: "This experience was a game-changer for our coaches and teams...it's clear how much you care about helping other teams grow. I loved how you presented everything so clearly, using a comprehensive document that took us step-by-step through the process. It's experiences like this that motivate us to keep improving and working toward our ultimate goal of making it to [world championship finals]." Through workshops, as well as numerous resources that we post yearly, 1678 supports FIRST teams globally.

A circuit not only powers robots but powers change. 1678 understands how hard it can be to troubleshoot issues in the heat of competition. To address this problem, we created Citrus Service—a FIRST-of-a-kind program. At every competition they attend, dedicated students offer technical assistance and loan parts to other teams. In the past 3 years, we've helped 636 teams (2,230 instances). Whether debugging code, repairing hardware, or lending tools, CS provides the assistance teams need to keep their robots running smoothly. Numerous teams have been inspired to start their service programs, 7 of which we trained—setting off a chain reaction.

A circuit might start small, but big things have small beginnings. Team 1678's journey began with building robots inside a shipping container in a parking lot. Over time, our impact grew, culminating in the creation of the Steve Harvey Robotics Center—a state-of-the-art facility named after our founding mentor. Our advocacy made this milestone possible: we met with our superintendent, writing a grant to secure funding from our school district that was matched by the State of California. Completed in 2023, our robotics center now serves as a hub for FRC teams locally and globally, hosting teams from multiple countries across 4 continents. Since its opening, we've welcomed 21 teams to our new facility for full-field practice sessions and technical collaboration. Just last year, we debuted our Week 0 event, the Citrus Invitational. Complete with pit areas, match schedules, and Citrus Service's technical assistance, it levels the playing field for teams without a chance to practice before competitions. This year, 11 teams will attend. Circuits start small, but with our facility, we charge the next surge of robotics innovation and ensure every team enters the season ready to succeed.

A circuit is only as strong as its connections. From the first light bulb sold at the Davis Farmers Market to the opportunities spread across communities and beyond, 1678 powers change. The teams we impact become role models for FIRST. The communities we impact start outreach programs of their own. The youth we impact go on to join our team and power our circuit by impacting others—activating the switch that connects our circuit in a never-ending flow. In doing so, WE LIGHT THE WAY. Powered by the lime, our circuit illuminates a light, and now, the world. ;

