

***FIRST* Impact Award - Team 3473**

2024 - Team 3473
Team Number
3473
Team Nickname
Team Sprocket
Team Location
Diamond Bar, CA - USA
Describe the impact of the <i>FIRST</i> 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 <i>FIRST</i> programs as mentors/sponsors.
100% of our alumni graduated high school & attend college; 90% of alumni pursue STEM fields; Technical experience and networking enabled 34 alumni to obtain internships and jobs at NG, Boeing, JPL, SpaceX; 7 Alumni dedicated 1000+ hours mentoring 6 FIRST teams, volunteering at 35 FIRST events, initiating Aerojet Rocketdyne Grant to 8 FIRST teams, publicizing XYZ 3D Printing Grant to 225 FIRST teams; Alumni apply FIRST values of service, inclusivity, & sustainability to their thriving careers.
Describe your community along with how your team addresses its unique opportunities and circumstances.
We view robots as stepping stone to connect all students with STEM opportunities; Promoting STEM and Business practices through lens of gracious professionalism; We understand challenges of starting and sustaining robotics teams, especially without mentors – therefore, we are mentors in the FIRST community; Allow others to discover the impact and fun of STEM; Mentor 6 MS robotics teams weekly, helped 3 schools districts start FIRST teams, introduced FIRST to students at 38 community events
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?
Partake in FIRST's mission of universal education; Partnered with Tonies (Toy Company) to write 3 original stories based on FIRST ideals. Literacy workshops brought 60+ students stories to life. Host annual STEAM Fair, involving 7 STEAM clubs, 5 FIRST teams, & 4 authors; gifted books & T-shirts to 500+ attendees promoting literacy & technology; 76% members joined TS after attending past outreaches; Published a STEM Magazine to capture FIRST's impact on the lives of 11 FRC teams around the world.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
100% of members partake in outreach, amassing 5000+ volunteer hrs annually; Volunteer at FIRST events: Beach Blitz 2021-22 & Socal Showdown 2021-23. Ran 4 FTC interleague & FLL tournaments

with 130 teams; Donated 600+ 3D Printers to California's education programs including 225+ FIRST teams; Produced a 12-page instruction manual for elementary kids to set up printers; Organized 10 CAD workshops for 9 FTC teams & 170 WVUSD students to inspire the creative design process & open doors into FIRST.

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

RoboGhana: mentor FLL teams & enhance the EV3 courses in the School of Ghana where students utilize LEGOS to learn the engineering process; Assisted FRC 7527 by opening our woodshop & hosting 3 annual exchange programs with Kaohsiung Municipal Girls' and Boys' High School from Taiwan, Tsinghua High School from Beijing, China, & Xiamen University; Machine robot parts and provide technical support to FRC 7527, 7157, 968, 5857; Secured 14 Lego Mindstorm Kits & initiated 3 FLL teams for 2024 season.

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?

Annual 5-week Summer Engineering Academy teaching 150 middle school students the creative design process, 50% participants return annually; Introduced 3 courses (Industrial Design Engineering Academy (IDEA) I & II) at our H.S. beyond A-G subjects, where 125+ students combine engineering & entrepreneurship, 45% students complete both courses; Host technology & inclusivity workshops with WVUSD Leadership programs; Ran 38 robot demos & established STEM courses into 24 school curriculums in OC.

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

Reached 2000+ students & hosted 15 outreaches through tight-knit partnerships with 15 sponsors; Partnered with XYZPrinting to create XYZ 3D Printing Grant for 225+ FIRST teams to receive 300+ 3D Printers; Launched 2x "Friends of Yimbo" 8K Walkathon with Dedicated 2 Learning Inc. & raised \$4000 annually to bring STEM to 472 students in Mungua Primary School in Yimbo, Kenya; Delivered arduino kits & laptops, teach an engineering & business curriculum, & mentor science fair teams at this school.

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

Coordinate with Native American tribes & Boys & Girls Club of La Habra to host CAD workshops & provided 100+ 3D Printers; Partner with education sponsors to provide 3D Printers for 72 underserved schools; Organize workshops for Boy Scouts & Girl Scouts to earn their STEM badges; Participated for 8 consecutive yrs in Pasadena City College's STEAMposium, showcasing robots to 400+ attendees (70% are African American, Hispanic); Hosted 2 CAD workshops with homeschool & special need students.

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

Connect with K-8 students in WVUSD — host open workshops, organize school field trips for 8 robotics teams to attend our regional competitions, perform robot demos at their events; Open doors to FIRST, cultivating interest to join; New members inherit knowledge from returners through pre-season training &

team passion projects ie. building arcade cabinets, NASA Techrise Challenge, & formulating outreach; Strong alumni presence who provide expertise & volunteer at outreaches.

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

Recruit at outreaches & visit local businesses with our STEM magazine & marketing plan materials; Educate them on FIRST values; Retain our sponsors by robot demos, social media posts, & provide updates detailing use of funds & impact; Feature logos on marketing materials. Example: collected photos of donated 3D Printers in action & sent them to XYZPrinting, through social media; Invite sponsors to our annual banquet & gift individualized thank you banners, T-shirts, photos, & letters.

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

Based in Diamond Bar (suburbs); Most Engineering companies are 30+ miles away from our build space, making mentors less accessible to routine visits; Mainly independent student-led team; Past 3 years had only 1-2 college mentors; Reach out to local businesses & alumni to secure mentors from L3Harris, Spyder3D, CSULA; This season is first time with >3 professional engineering mentors; We retain mentors by providing compensation, team apparel, and forming deep connections with gratitude.

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

Goals include starting FLL teams in Yimbo, Kenya. Teachers from Barkenyango School will visit in April. We have 14 Lego Mindstorm Kits to take home to Yimbo. Locally, we enhanced 4 neighboring FIRST teams imaging & branding, providing pit banners & customized T-shirts; TS members lead a school business, PrintedWorks; Earnings from 350+ orders from the City of Diamond Bar support donations; Donated 170+ T-shirts & 30+ banners for 5 FIRST Competitions; hosted FIRST T-Shirt Design Competition.

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.

Our 3D printing initiative began with a parent from our Summer Engineering Academy; Inspired by our initiatives, his company endowed Team Sprocket with 1400+ printers to distribute; Leveraged connections with FIRST coordinators, teams and industry partner SpyderLab to provide 3D-printer grants. Over a half a million dollars worth of 3D printers have been distributed with more in weeks to come. This opportunity will establish new partnerships, promote FIRST and celebrate STEM education.

Judge Feedback

Who/When

Feedback

Mar 18,
2024
12:43:47
AM EST

After hearing from all the presentations from this Regional, what initiative(s) would you like to see receive more support in the coming years?

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

MISSION: Like a powerful rocket blasting off into space, Team 3473: Team Sprocket ignites innovation, propels through barriers, and soars to new heights. Our mission is to use STEM education to create change and build a stronger network with fellow changemakers, as we develop Dean Kamen and Woodie Flowers's vision of a brighter future. Guided by the principles of FIRST and our team values: service, inclusivity, and sustainability, Team Sprocket recognizes the sky is not the limit, but merely the beginning of an extraordinary voyage for the next generation of engineers and business leaders.

LIFTOFF STAGE (FOUNDATION): Team Sprocket's debut in 2011 marked Walnut Valley Unified School District's entry into FIRST. Our alumni established the team to practice their love for STEM. With a narrow focus on building robots, the team took a hiatus the next season due to inconsistent mentor support and member engagement. The next 3 seasons yielded similar limited results, until our team discovered purpose beyond the competition scene. In 2016, our members cultivated a new appreciation for outreach efforts, expanding their understanding of FIRST's mission, and charting a new trajectory for our team that focused on "More Than Robots."

Embracing Gracious Professionalism and Core Values, our members prioritized outreach efforts in our surrounding community as ambassadors of FIRST. We've run workshops to help K-8 students discover new skills and apply them to solve challenges in their community. We fostered an inclusive environment where members worked with diverse individuals, exploring different perspectives to maximize their experience. To ensure team members sustain these values and commitments, we have branded our outreach initiative, "FIRST THINGS FIRST," which guides us in prioritizing our efforts toward our mission of increasing STEM access and engagement among the next generation.

FUNDING: Today, Team Sprocket has 61 dedicated members, 25% more from three years ago. We raise \$30,000 every year through 15 sponsorships, 9 grants, and various donations to provide an interdisciplinary education for all members. Our sponsors include Raytheon, Boeing, Gene Haas Foundation, and Aerojet Rocketdyne, as well as local business partners SpyderLab and Dedicated to Learning, Inc. Beyond supporting our own team, Team Sprocket has donated \$1,300 worth of volunteer T-shirts, event banners, and competition signs for 5 FIRST competitions.

DONATIONS: Team Sprocket secured \$500,000+ of 3D printers through a new partnership with XYZPrinting. We've coordinated the procurement, transport, storage and distribution of devices with the support of industry partner, SpyderLab. We established a 3D-Printer Grant for FIRST Teams, distributing 300+ devices in total to 30 FLL teams, every competing SoCal FTC regional team (198 teams), and 15 FRC teams. An additional 200 devices will be distributed to FIRST teams at upcoming Regional competitions and distribution events. We use social media to show our appreciation to XYZPrinting and showcase the impact of their donation, featuring device usage among the 250+ FIRST Teams, STEM programs and diverse community organizations (American Indian reservations, Boy Scouts & Girl Scouts of America, and Boys and Girls Club of La Habra).

ASCENT STAGE: Outreach Opportunities

WORKSHOPS: For 5 years, Team Sprocket's annual 5-week Engineering Summer Academy engages 150+ middle schoolers, providing 100+ hours of lessons in engineering, computer science, graphic design, 3D printing, drones, and robotics. This season, Team Sprocket hosted 10 CAD workshops with 9 FTC teams and 170+ students, providing a 3-D Printer to every attendee to empower them to explore

engineering. Additionally, Team Sprocket has partnered with Tonies, a company making toy audio recorders, to provide 2 storytelling workshops, teaching 30 middle school students how to bring their stories to life through STEM.

MENTORING: In the past 3 years, Team Sprocket has supported 6 FIRST teams for over 100 total hours. In recent years, Team Sprocket has actively supported FTC teams 12861: Roboheroes, 14531: The 2nd Rebellion, and 6436: Alpha Genesis. We also support FRC 5857: Walnut Valley Robotics (WVR), 968: Robotics Alliance of West Covina (RAWC), and 7157: μbotics. Whether it be providing 3D printers to 225+ FIRST teams or opening our woodshops on weekends for 4 local FRC teams, we are committed to sharing our resources to help others pursue their passions.

SUSTAINABILITY: To ensure Team Sprocket's initiatives are sustainable, our team's leadership structure is strong and supportive. Our team consists of three captains supporting two main divisions: Engineering and Business. These divisions branch out into 6 sub-teams: Mechanical, Programming, CAD, Electrical, Publicity, and Operations. Our more seasoned veterans mentor newer members, passing on experience and confidence. This allows them to tackle challenging projects and outreaches, and inherit knowledge from older members.

ORBIT STAGE: Making Change

BEYOND FIRST: Team Sprocket members teach STEM beyond FIRST. Through Kode4Kids, a nonprofit organization started by 5 members, we provided free coding lessons to 300+ K-12 students, with 80 high school students creating and teaching those lessons. With bi-weekly courses ranging from Java to Python, 30+ students have applied their new skills to FIRST robotics. Additionally, 3 Team Sprocket members direct The Stem Stitch, a nonprofit organization teaching 118 high schoolers social justice advocacy in STEM education through monthly publishing of magazines. This year, our team collaborated with The Stem Stitch to release a FIRST magazine, capturing 11 FIRST teams from 4 countries. Moreover, after five members won the 2022 NASA Techrise Challenge, their project researching the effects of microgravity on liquid transportation was set to launch into space with Blue Origin.

INTERNATIONAL SPACE STATION (SCHOOL EVENTS): Team Sprocket has continuously worked with the Los Angeles Community to host 38 robot demos and established STEM-based courses into 24 after-school curriculums. In 2022, Team Sprocket introduced FIRST core values of teamwork and innovation in developing 2 new engineering courses, Industrial Engineering Design Academy (IDEA) I and II at Diamond Bar High School, with 125+ high school students currently enrolled. Our newest course, Innovations in Technology, explores the intersection between business and engineering innovation, and will be released in the 2024-2025 school year. Furthermore, in collaboration with Printed Works, we've hosted 9 workshops with 630+ attendees expressing their creativity by designing 350+ T-shirts. Our expanded manufacturing capabilities allowed us to provide 30+ banners and 170+ T-shirts to FLL, FTC, and FRC competitions, including SoCal Showdown.

INTERPLANETARY SPACEFLIGHT (LOCAL EVENTS): In the past three years, Team Sprocket has represented FIRST in 38 local events. Further, our team has run a STEAM Fair, featuring tech demos from 5 FIRST teams and 7 STEM clubs. We also invited authors to read their books for 500+ attendees and gave each attendee free books to advocate literacy. To promote the arts, 25 artists performed dances and songs on stage. 15 City organizations hosted booths, including the Walnut Valley Water District, who raised community awareness on water conservation. Finally, we've run (2) 2023 FTC

Powerplay Interleagues, (2) 2024 FTC Centerstage Interleagues, and the 2023 FLL Masterpiece Qualifier, with over 150 FIRST teams participating and Boy Scouts earning their STEM badge for volunteering.

BEYOND THE MILKY WAY (GLOBAL EVENTS): Team Sprocket values universal access to educational resources. We hosted 6 international outreaches, among them an annual 8k charity walk-a-thon reflecting the distance that children in Yimbo, Kenya walk daily to go to school. The event has 100+ attendees and fundraises ~\$4000 annually – enough to deliver engineering kits we designed to 472 students in Yimbo. Due to their lack of funding preventing STEM studies, our team has developed an engineering and business curriculum for their school, providing a foundation of FIRST-specific skills. Additionally, we partnered with Coderina, an African technology-focused nonprofit, to host 4 online STEM workshops, introducing engineering and project-based learning to 400+ students and teachers in Ghana, Nigeria, Kenya, Tanzania, South Africa, Togo, and Sierra Leone. Further, we have partnered with RoboGhana to mentor teams weekly for FLL and required EV3 Courses at the primary school of Ghana. We've dissolved language barriers, bringing worlds together through hosting 3 exchange programs with Kaohsiung Municipal Girls' and Boys' High School from Taiwan, Tsinghua High School from Beijing, China, and Xiamen University, exposing 100 students to the FIRST community.

FLIGHT PATH (FUTURE PLANS): As a team that strongly values change, Team Sprocket cultivates an environment with students and mentors who continuously find ways to improve. We are eager to explore opportunities that combine not only our STEM knowledge but also our knowledge of the world. Whether it be through teaching teachers from Barkenyango, Kenya FIRST-specific skills in person (in April) or mentoring several FIRST teams next season, we look forward to blasting off to unprecedented heights.

CONCLUSION: At the 2023 FIRST Championship, Dean Kamen reiterated the primary mission of FIRST: "We've got to get what happens at FIRST to be more spread, to more kids, more quickly all over the world." Team Sprocket resonates with this goal. We aspire to break down financial and language barriers at FIRST. We aspire to positively impact others at FIRST. We aspire to better understand what equal opportunity might look like at FIRST. ;

