



Coconino High School Robotics

FRC Team 2486 · The CocoNuts · Flagstaff, AZ

FIRST Robotics Competition Team 2486 “The CocoNuts” Present our 2021 Chairman’s Award Submission “Renaissance”

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.

The CocoNuts (2486) have a mission to provide opportunity. 100% of Nuts graduate High School and are accepted to college, all pursuing STEM careers. 1/3 of total grads and current Nuts are 1st Generation College students. Being a Nut opens doors to Honors, AP & IB courses, Biomed Internships, employment to teach coding, District IT jobs and college prep enrichment. 60% of recent AlumNuts are mentors, FIRST volunteers or employees.

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

Coconino HS is diverse; but we have many families facing financial hardship. We structure our team so costs are not a barrier to participate. Students from all cultures & identities are welcome.

In “America’s 1st STEM City” we do outreach side-by-side w/STEM professionals as a model for local STEM teams.

We support Indigenous FIRST teams by traveling, putting on workshops and mentoring remotely. COVID hit our Indigenous families hard. We 3D printed 500 face shields for a Navajo (Diné) hospital.

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 average 20+ outreach events/yr. Our Junkyard Bots is a FIRST-like game that engages all, toddlers to CEOs. Our Lunar Rover is instantly recognizable, portable, drivable by kids & starts conversations about FIRST. Our YouTube channel hosts FTC events, workshops, media & averages 6500+ views/year. Our social media channels have 3400+ followers. We are outspoken STEM advocates at the AZ Capitol. Results are tracked w/database of outreach history, media metrics, log of 100s of media appearances.

Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.

We are selfless with time, money & expertise. We’re the team that’s called when a FIRST event needs help, traveling 1000s of miles to fill volunteer gaps (ex: Prescott & No.PHX FLL). We train others and serve as FTC key volunteers & event hosts. We donated \$250 to Child Crisis AZ (fundraiser by FTC18312).

We bought 4 fields to lend to AZFTC teams for remote events & game pieces for each AZ team. Teams reach out from all over for our knowledge in marketing & Chairman’s process (ie.FRC166).



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

Our 2020/2021 AZFTC Relief grant sponsored 6 struggling teams for a total of \$900.

Every local *FIRST* team that needs a mentor is paired with a dedicated Nut. In "normal" years we mentor up to 12 teams; we continue to work remotely with teams this year.

We hosted a 2020 FRC Kickoff for rural Northern AZ, providing 1-1 assistance catered to each team's needs. For 2021 FRC Kickoff we hosted "MYRFCHO: Miss You Robot Friends, Come Hang Out!" AZ teams and volunteers came to brainstorm & reconnect.

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?

Empowering teachers is a catalyst for STEM & *FIRST*; they're the ones who have the power to start in-class and afterschool programs, reaching 100s of students a year. Our original "FLL in a Nutshell" PD program now includes FRC & FTC. In collaboration with Northern AZ University (NAU), we offer rookie & 2nd-year coaches hands-on, personalized training throughout the FRC season. We offered remote PD to teachers throughout the shutdown. Teachers are now awarded PD hours for FTC Kickoff & workshops.

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

NAU: Donates venue for AZNorth FRC, AZFTC Champs, *FIRST* Scholarships. Center for Sci Teaching & Learning & Sanghi Foundation sponsor our *FIRST* PD program

FUSD: Donates *FIRST* event venues & our workspace; sponsors our travel to support *FIRST* events; pays PD time for teachers to attend workshops

Flagstaff Family Food Center: Donates food for our travel; in return we host food drives at *FIRST* events yielding 100s lbs of food

Annual Sponsors: Boeing, WWT, AlticeUSA, GKC Geosciences, NASA (\$6950/yr)

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

We've grown AZFTC by fostering partnerships with NAU and U of A to create an AZ support network. We were awarded a '21 STEM Equity Grant for \$4K to start FTC teams at Diné dormitory schools near Flagstaff. The grant covers registration, robot kit, field kit, and an off-season event. This Pilot program will be duplicated at other schools on the reservation with the support of NAU. UofA also contacted us to help develop SW AZ & received an \$800,000 grant for STEAM and Equity to start *FIRST* teams.



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

Outreach recruits new 'Nuts at a young age by connecting them to K-8 FIRST teams. Flagstaff kids grow up looking up to 'Nuts as role models & mentors, hoping to join 2486 knowing FIRST Core values. Starting their 2nd year, 'Nuts actively teach members team culture, technical skills and FIRST volunteer roles. Mentors excel at seeing potential in new 'Nuts and offering growth opportunities such as presenting to legislators, learning to ref, mentoring teams and exploring individual passions.

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

Our visibility attracts sponsors; many get their 1st taste of FIRST as volunteers. We host a yearly banquet where we share testimonials of impact. Sponsors receive VIP treatment at our NAZFCR & FTC regionals, which includes lunch and interaction with local dignitaries. Our sponsors are honored in all video, print and news media. Each donor receives a personalized thank you package. A goal is to collaborate with the chamber of commerce to build partnership with the Flagstaff Business Alliance.

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

During COVID, new 'Nuts were recruited through direct communication. Pre-COVID we had school announcements, flyers and a club fair. Diversity has increased, but doesn't yet reflect our school; Female members went up from 15 to 25%, minority members went up from 20 to 36%. We plan to partner with Coconino County to organize a STEM, neighborhood culture fair; inviting diverse STEM leaders and engineering cohorts. The best way to increase minority population is through representation.

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

Being the **OFFICIAL** organizational sponsor for AZFTC, 2486 believes in FIRST's motto: "Every student, Everywhere, Any time." We hold workshops & trainings for students, event hosts and volunteers. We act as key volunteers and host one of the largest FTC championships in the US. In this remote FTC competition season we served 55 teams, including 8 rookies. We supported NMFTC in the development of their independence. We also run and host one of the largest and longest running FLL qualifiers in AZ.

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.

PeoplesTV and The Simons Foundation flew from New York to make a documentary titled "Fireworks, Apple Pie and Robots" with the message of 2486 as a new beginning. It tells the story of a child told by adults that he couldn't become an Engineer. This child finds a home within the CocoNuts, an outlet for creativity, a place for growth, and opportunity.

Our team was featured at the 2019 FIRST Championship Showcase because our goals, our mission, our beliefs, and our dreams are genuine.



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Renaissance: The rebuilding and revival of society after tragedy; a movement of intellectual activity.

We all remember where we were a year ago when, overnight, “normal” experienced a renaissance. We were showcasing our robot at Flagstaff’s largest annual STEM event on the very spot where our FRC Regional was set to play, when we got word that the tournament was cancelled. Life around the world shut down, and FIRST was forced to cancel all remaining 2020 events. This was the birth of a “new normal”. Our program and society were forced to undergo a modern-day renaissance.

For the past 14 years, Team 2486 has been inspiring and supporting others; from elementary to high school students, local to state legislators, teachers to administrators, volunteers to FIRST partners. We aspire to foster lasting change wherever we go. We, The CocoNuts, aren’t just engineering students; we are a diverse community of student leaders, combining unique backgrounds to accomplish our mission. While the world is undergoing its own renaissance, Team 2486 is committed to providing FIRST values to all, using our collective voice to shape the “new normal” of our future.

FIRST created a new way for teams to compete in a matter of months, and the CocoNuts, as the organizing sponsor of Arizona FIRST Tech Challenge, found a way to bring this new version of FTC to as many teams as possible. In “normal” years, our AZFTC Kickoff draws over 700 people for a live game reveal and interactive workshops. As part of our successful shift to a remote platform we combined a variety of expert resources to produce 21 distinct on-demand workshops on our YouTube Channel. The ‘Nuts set up four safe, in-person sites, where teams had the opportunity to engage with the new field on the day of the reveal. We also purchased and delivered a game piece for every AZ team.

We hosted some of the earliest events in the world using FTC’s new remote format. As such, we tested new software and offered feedback to provide a user-friendly experience for partners and teams around the world. We developed a set of best practices for FIRST that we shared with all the Program Delivery Partners. It’s important to us to bring the energy of a traditional event to our live-streamed award ceremonies. Therefore, we created a space for teams to share photos, videos, random dance parties, and amazing robot moments. We then transformed their memories into a video spotlighting each team’s journey.

Mentors, sponsors, and many more support systems have been lost entirely for many teams. To sustain struggling teams that would otherwise fold, we developed our COVID Registration and Relief Grant. Teams are able to submit a request for financial help. A panel of ‘Nuts review each application and award funds based on a team’s financial need and commitment to the FIRST Core Values. FTC17062 said, “This grant means so much to us, especially since it’s only our 2nd year, and we have many new members. We’re grateful to have the opportunity to show what robotics is all about and what the Squips stand for.”

Team 2486 runs one of the largest FTC Championships in the country, drawing 1500 people representing 48 teams from four states and Mexico. Last year’s special guest was FTC Director, Ken Johnson. Ken’s thank you letter to us said, “Your group is the arms, legs, and strategic



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planners around the entire FTC effort. I think this is a wonderful way to make FIRST work in AZ. More importantly the CocoNuts are developing leadership and management skills that will serve you well in higher education and whichever careers you choose." We refuse to compromise the quality of our program. This may require renaissance after renaissance, adapting to our ever-evolving world and circumstances to ensure for posterity that AZFTC continues to meet the needs of all.

Team 2486 supports the FIRST community at all levels, not just FTC. In 2013, The 'Nuts conceived the Chairman's Exchange: a radical, demystifying approach in how Chairman's was presented, introducing a new form of collaboration between teams. It has become a place where teams from all over the world can share their presentations and embrace Coopertition. ChEx has now been held at 165+ FRC events internationally. Teams have given ChEx their own flair and have taken the initiative to host remote events in 2020. FTC15701 from Mexico called us to reimagine ChEx for the FTC Inspire Award. With our guidance, they're piloting the Inspire Exchange in Mexico. We plan to invite AZ teams to implement this model in FTC. They wrote, "We wanted to thank you for your inspiration and help to create The Inspire Exchange. We hosted the first event via Zoom, it went extremely well. We were able to interact and share experiences with other Mexican FTC teams. It was both informative and fun!"

Team 2486 has also pioneered our renowned "FLL in a Nutshell" curriculum for aspiring coaches. Student 'Nuts teach teachers everything, from the Project & Core Values to programming & design. Teachers learn robots the same way their future teams will. Since its inception it has been used to jumpstart countless teams. This curriculum has been presented at FIRST headquarters and numerous school districts where teachers earn professional development credit through our partnerships with FUSD and Coconino County. To further our constant renaissance of team resources, we are revitalizing "Nutshell" to include updated programming information and a new pushbot model built for the EV3 brain.

Lasting change begins from within, but often needs support. That's why 2486 has been consistent in spreading the importance of FIRST to our political leaders. For five years we've appeared at the AZ Capitol to promote STEM education via FIRST. We began by participating in "Take Your Legislator to School Day". Shortly after, we received an invitation to the AZ capitol to showcase FIRST, our robots, and STEM to the House of Representatives. In 2017 we were the first AZ delegates at the National Advocacy Conference (NAC) in Washington, DC, later sharing what we learned with 8 teams at our AZ Advocacy Conference. The following year, we were invited to champion teacher, coach and mentor stipends to the House Technology Committee. Last year we presented to the Senate Education Committee as part of the weekly "Spotlights on School Success". This school year we sent a 'Nut to the virtual NAC and presented remote advocacy workshops for AZ FIRST teams. We've been promised a meeting with our AZ governor to continue the conversation of STEM education as soon as conditions allow.

Our advocacy can be seen by spreading FIRST as well as promoting STEM education in many forms. We spend hundreds of hours in our community demonstrating our robots at dozens of events, such as the ten-day Flagstaff Festival of Science, the community-wide STEM night, the county fair, and elementary STEM events. We were commissioned by Flagstaff and SciFest to



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create a 1/4 scale replica of the Lunar Rover for the Lunar Legacy celebration, a yearlong event spotlighting Flagstaff's role in the Apollo missions. This rover is immediately recognizable, drawing kids and parents alike into conversations about FIRST. It even welcomed Moonwalker Charlie Duke to his SciFest KeyNote speech! We also hosted a NASA-sponsored robotics challenge and FLL/FTC Invitational that attracted teams globally. Partnerships with Northern Arizona University, USGS, and Lowell Observatory allowed us to provide field trips to Apollo test sites during the event, giving young teams the honor to test their robots where Apollo astronauts tested theirs!

We have seen the effectiveness of our outreach and strive to continue making an impact. Through Zoom we instructed elementary students in algorithmic-thinking and how robots complete real-life tasks. To replace our usual SciFest appearances, we recorded a message for a TED-Style talk. We were also hired by FUSD to prepare elementary teacher iPads for remote learning for the unprecedented 2020 school year. Tinkertopia, a neighborhood STEM center, hired 'Nuts as mentors, pairing kids with high school programmers to teach computer science fundamentals and coding. We also contributed letters of support to our neighborhood elementary school as they prepared grant applications to the AZ Community Foundation and National Science Foundation to expand access to after-school STEM programs for low-income families.

Our ambitious future includes increasing STEM on the Navajo (Diné) Nation. This season we received a FIRST STEM Equity & Access grant to pilot FTC for Indigenous FIRST Teams. Our grant will start teams in two dormitory schools in Northern AZ which house students from several Indigenous Nations across the vast Four Corners region. The grant offers students the chance to do STEM, without worry of transportation or cost, in a familial community. The CocoNuts' partnership with NAU's Center for Science Teaching and Learning is expanding this program to schools deep in the Diné Nation and Southern AZ. Along this same line, we were contacted in February by the University of Arizona in Tucson to build similar FIRST programs and support in Southwest AZ and Mexico, promoting our mission of STEM education through FIRST for everyone!

The CocoNuts are committed to revival after tragedy. Our passion and drive to rebuild in the most strenuous circumstances is a true testament to the renaissance that our team strives for. We look forward to hugging the friends we have made through video screens, dancing in unison, and having a huge celebratory high five line. Until then, we aspire to be the leaders of the renaissance, the figures of renewal, and the start of revitalization. As we reflect on all the adversity we've overcome, we remember that a new beginning is today.