



Coconino High School Robotics

FRC Team 2486 · The CocoNuts · Flagstaff, AZ

Team 2486 “The CocoNuts” present our 2022 Chairman’s Submission “15 years of Going NUTS!”

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.

2486 strives to provide opportunity to all. 100% of ‘Nuts graduate high school & go to college, 90% in STEM. 90% of current ‘Nuts are enrolled in honors/AP/IB/DE classes. 1/3 of our 42 AlumNuts & class of ‘22 are 1st generation.

Class of ‘22: so far are accepted to Columbia, Embry Riddle, CO School of Mines, ASU/UA/NAU + competing for spots at MIT, WPI, Boston U. Seniors unanimously agree that FIRST helped open these doors. We’ve had 4 Dean’s List Finalists in the last 3 seasons, 12 total.

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

Flagstaff borders the Diné (Navajo) Nation, the largest Indigenous Reservation in the US. The Diné people are neighbors, friends, and family. They were hit the hardest during COVID because of their tight kinship. We supplied 500 3D printed face shields to affiliated Diné clinics.

It’s over 2 hours travel time between Flagstaff and isolated communities on the reservation, but we go the distance to support any Diné FIRST team in need, including teams in Tuba City, Window Rock, and Tonalea.

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?

To ensure sustainability of our 20+ events/yr, we instill passion for FIRST’s mission. Outreach is the 1st thing new ‘Nuts do. An extensive database measures all outreach results, including 2100+ hours of work in the last 3 years. Our Junkyard Bots is a hands-on robot race that engages all from toddlers to CEO’s. 10,000 people have met our instantly recognizable Lunar Rover that celebrates our Lunar Legacy & starts conversations about FIRST. Our social media channels have 3400 followers.



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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 exemplify FIRST Values:

Discovery: No way! We built a Swerve!

Innovation: Remote & Interactive FTC ceremonies connected teams in '20/21

Impact: Service includes Food & T-shirt drives @ tourneys, Adopt-a-Trail, \$250 donated to Child Crisis AZ

Inclusion: Nut-run "También Lo Puedo Hacer" = STEM diversity fair

Teamwork: ChEx = international movement building Coopertition among teams, celebrating & encouraging all (75 events in 3yrs)

Fun: Infectious enthusiasm, dancing, joy; can't miss us 'Nuts!

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

We build sustainable teams by training coaches via FLL in a Nutshell, which is catered to each individual's needs & begins mentorship that carries on throughout the season. In 3 yrs it assisted 15 teams & restarted 7 post-COVID. Local teams (avg 12/yr) receive dedicated weekly mentorship from 'Nuts, including on Zoom last season. 35% of current members had a 'Nut mentor in FLL/FTC prior to joining the team. Expert 'Nuts personally travel to mentor other FRC teams in Phoenix & Northern AZ.

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?

We headline STEM City events like SciFest & Community STEM Night (5000 people/yr). We partnered with NAU to host the Lunar Legacy Invitational, featuring NASA challenges, trips to Lowell Observatory & Apollo test sites, drawing distant teams (even Hong Kong!) Nuts are coding mentors for neighborhood kids through Tynkertopia program. During remote learning, we served "PB & Algorithm Sandwiches" to 50 kids and taught lessons on robotics over Zoom. We inspire these kids to seek more STEM programs.



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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 facilities for AZ FTC Champs, FRC AZNorth (\$80,000 value). We created a PD program w/ Center for Sci Teaching & Learning to support rural FRC teams.

FUSD: donate event space, vehicles/gas for travel, pays PD for teachers attending Nutshell.

Boeing: \$3000/yr

SuddenLink: \$1000/yr

Amazon Future Engineers: \$1600 to AZFTC

Microchip staff: \$1000/yr

Keeps cost low for Nuts

In-Kind:

Flagstaff Food Center: meals in exchange for Food Drives

Copper State Bolt & Nut: hardware

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

In 2021 we received 2 grants to expand AZ FTC (\$1,500 from the AZ Center for Afterschool Excellence and \$4,100 Equity, Access and Inclusion Grant from FIRST). The grants are to start and mentor 3 new teams in dormitory schools on the Diné Nation. This is a pilot program that will be replicated across the Diné Nation and potentially into southern AZ in partnership with NAU CSTL to offer opportunities to participate in FIRST to everyone, everywhere.

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

Half our team is graduating, but we're confident that our legacy and expertise will continue.

'Nuts mentor each other, and underclassmen are put in positions of importance immediately.

Potential & interest is explored, comfort zones pushed, so 'Nuts grow into leaders, innovators, problem solvers. Being put into Key volunteer roles or presenting to Senators or for Chairman's in 9th grade can be daunting, but a safety net of experienced 'Nuts give new members success and a safe place to fail.



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

Many of our sponsors first experience FIRST as volunteers. Inspired by our work ethic and professionalism, they are drawn to the team. Sponsors receive VIP treatment at all our events with lunch and time with local dignitaries. Our sponsors are credited in all media releases. Each donor receives personalized thank you packages yearly and are invited to a banquet to honor their impact. The Flagstaff community supports us by donating an average of \$18,000 a year via the AZ Tax Credit Program.

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

We have made progress toward our goal to mirror our school population and include more girls in the team. In the past year alone our female population grew from 25% to 35%. We empower young women to join the team by having strong female role models in key roles, such as lead presenters, drivers, and mentors for younger teams. We've been invited to partner with NAU Engineering College to support an all-girls robotics summer camp due to our exemplary initiatives in this area.

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

As the official Organizing Sponsor for AZFTC & formerly NMFTC, we believe in making FIRST accessible to every student, everywhere, in all programs. In 3 yrs we've run 26 FLL & FTC Kickoffs, qualifiers, Championships & scrimmages + supported 38 other FLL/FTC/FRC events, totaling 10,000 volunteer hours. We retained 90% of pre-COVID AZFTC teams by coordinating 18 video workshops for Kickoff, running energetic remote qualifiers & connecting teams via our interactive, live-streamed award ceremonies.

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 story is often used to show the impact STEM has on lives. The Simons Foundation from NY created "Fireworks, Apple Pie and Robots". It is a story of empowerment with a clear message; "It doesn't matter where you come from, you can become anything you want." During the '19 FIRST Championship Showcase, our coaches shared the stage with Dr. Woodie Flowers & one of our 1st AlumNuts. By telling our story, we reminded volunteers, sponsors, & FIRST program partners why what they do matters.



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15 YEARS OF GOING NUTS!

A 15th anniversary is celebrated with crystal, a reflective and resilient material to reminisce on the past and build a strong foundation for the future. The history of the CocoNuts is illuminated with success, but also full of challenges. Through it all, we never waver in our mission to "Extend STEM opportunities to the rural, underrepresented areas of Northern AZ and beyond through FIRST." The pressure from this daunting task has forged our team into prisms of hope, shining the brilliant light of FIRST into our community to foster sustainability, equity, and growth in the vast state of Arizona.

ADVOCACY

Our advocacy focuses on educating potential allies to support our mission of growing STEM opportunities at the local, state, and national levels. Local advocacy begins at our school board meetings. Due to our endorsement, district teachers are now able to take our FLL in a Nutshell training for Professional Development hours and to get paid. Sheryl Wells, STEM Coordinator at Killip Elementary said, "The CocoNuts made the journey to becoming an FLL coach more accessible. The team has continued to support our FLL team and our school's STEM program as a whole. LEGO Robotics and STEM education in our community has benefited greatly from this hardworking and caring team."

State-level advocacy has taken us to the Arizona Capitol for the past 5 years. We've met one-on-one with our representatives, presented the colors to open the House session, and hosted a training and advocacy day for eight AZ teams. We were recently invited by our elected officials to present for the House Technology Committee and Senate Education Committee. Our work has proven successful in enacting awareness of the value of the time FIRST coaches dedicate. As a result, more schools offer paid stipends and have seen growth in all levels of FIRST.

We are the first AZ team to attend the National Advocacy Conference (NAC) thrice. Using what we learned at NAC, we presented advocacy workshops to AZ FTC and FRC teams. These teams are more empowered to grow STEM programs in their areas. At the 2021 NAC we met with the staff of Senators Mark Kelly and Keirsten Sinema, and Representative Tom O'Halloran, to inform them about legislation on STEM education and ask for their support. Because of our advocacy and continued student-initiated correspondence, we will have representatives from the Senate at a 2022 AZ FRC regional.

PARTNERSHIPS

The Sanghi Foundation in their effort to increase the amount of FRC teams noted a massive problem; teams would fold after a few years even with financial support. Due to our expertise in building and sustaining teams, NAU's Center for Science Teaching and Learning (CSTL) and the Sanghi Foundation contacted us to start a Professional Development course modeled off of our FLL in a Nutshell program to develop rural, rookie FRC teams. This program mentors coaches in all aspects of running a successful and sustainable team. We cater to each team's individual needs throughout the year. Five rookie teams have participated so far, and there are plans to replicate this program in other regions of Arizona. Our model has expert teams serve as mentors in their areas to create sustainable programs for students to engage in the life-changing opportunities of FIRST.



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OUTREACH

The CocoNuts are valued and respected members of not only the STEM community but Flagstaff as a whole. STEM-related events such as the annual STEM Night and the Flagstaff Festival of Science draw in youth to play catch with a robot or drive our 1/4-scale replica Lunar Rover while educating the public about FIRST. Our robot also appears in some unexpected places, such as the annual July 4th parade, Coconino County Fair, chess tournaments, the AZ School for the Deaf & Blind, and a National Defense Manufacturing Conference.

We use our "relentlessly-positive" media presence to keep our community aware of our activities and build awareness of FIRST programs. Radio and TV interviews, innumerable newspaper articles, features in the SciFest newsletter, and even an interview on a radio show about high-school sports add up to over 200 media appearances in our history!

Our team is instantly recognizable because of the thousands of hours we spend each year serving our community. We have earned a reputation as youth who can engage anyone, exhibit professional and role model behavior and provide fun experiences to any audience. Our community reciprocates our generosity with tax credit donations and volunteering at our FIRST events. When a CocoNut created an event celebrating diversity in STEM called "También Lo Puedo Hacer (I Can Do it Too) STEM Extravaganza", 15 local STEM organizations, leaders in STEM from minority populations, and local food vendors all came together to make it a reality.

AZ FIRST TECH CHALLENGE

Running a state-wide FIRST program requires commitment, passion, and organization. Most FIRST programs are managed by large organizations such as universities, non-profits, or corporations. However, the CocoNuts are the official managing organization for Arizona FIRST Tech Challenge. Students play a critical role in running the program. FTC Director Ken Johnson attended our 2020 AZ Championship and said, "The CocoNuts are the arms, legs, and strategic planners around the entire FIRST Tech Challenge effort. I think this is a wonderful way to make FIRST work in AZ. More importantly, CocoNuts are developing leadership and management skills that will serve them well in higher education and whichever careers they choose."

We manage team entry fees, averaging around \$25,000 per year. This includes purchasing official fields, a game element for each team, volunteer t-shirts, awards, catering, travel expenses for key volunteers, and necessary equipment for AZFTC. Each season we invest extra funds back into the program, with the goal of sustainability. Leftover funds from the remote season were used to sponsor and run the "Ultimate Reunion Tour", allowing teams to finally play the "Ultimate Goal" game in-person and on alliances with no additional entry fee.

We send crews of 10 or more CocoNuts to new qualifiers, those in need of volunteers, or held early in the season. This ensures that our team is ready to run the dual-division AZ FTC Championship and train new volunteers to move into key leadership and volunteer roles such as FTAs, score trackers, and inspectors. The majority of these roles are filled by trained CocoNuts. We believe it's important to maintain the quality of the program we worked so hard to build, so we often give up precious build time during our FRC season to support all events including AZ FRC regionals and the FLL program statewide. We maintained high-quality events, even during the remote season. FTC Team 14584 said, "Your work and encouragement made it possible for



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us to keep the momentum of the program going through difficult times. Your work matters to all of us!"

In the past two years, we've financially supported FTC teams in need. During the remote season, it would've been easier to step back without in-person events. However, if the pandemic taught us anything, it's that the benefits of FIRST are more important now than ever. We couldn't stand by and let teams fold. In 2020 we wrote the CocoNuts Registration Relief Grant to assist teams who lost funding due to COVID, so everyone could play no matter their circumstances. We sponsored 6 teams last season (\$900), and 8 teams this season (\$1150). For three years, we've also given all qualifying tournament hosts a 25% discount on their season entry fees as a way to say thank you. These grants come from our team's operational budget. We keep our entry fees low so that FTC is available and accessible to more students across Arizona.

ACCESS & EQUITY

Our mission includes access to STEM for all, including the Diné Nation. The Diné people are hungry for STEM, but obstacles such as high teacher turnover, poverty, negative societal expectations, and lack of internet access hold many indigenous schools back from starting programs. Last season we received a FIRST STEM Equity & Access grant to pilot FTC for indigenous students. Our grant will start teams in two dormitory schools in Northern AZ that house students from several indigenous nations across the vast Four Corners region. The grant offers students the opportunity to participate in STEM, without the worry of transportation or cost. Our partnership with NAU's Center for Science Teaching and Learning is expanding this program to schools deep in the Diné Nation and Southern AZ. This season we were awarded \$1,500 to start a third team from the AZ Center for Afterschool Excellence. We were also contacted by the University of Arizona in Tucson to build similar FIRST programs and support in Southwest AZ and Mexico. With the CocoNuts mission to bring FIRST into students' futures, indigenous students are now able to weave and bead their own stories with happy thoughts.

LOOKING FORWARD, LOOKING BACK

When reflecting on our 15 years of growing STEM education, expanding FIRST, and supporting teams, nothing compares to the impact the CocoNuts has on individual students. We are facets of our team's history, refracting different points of view to accomplish brilliant feats and giving clarity for not only the team's future but the future of each individual. From the first-generation students attending Ivy League universities to those overcoming grief and anxiety presenting in front of our nation's leaders; those who never envisioned themselves in STEM, and those who dreamt of it from day one. Our light impacts every single person that it touches, even second or third-hand. Parents, spectators, volunteers, and kids all find purpose through the CocoNuts. Our mission of expanding FIRST is crystal clear, and our future is bright!