



Coconino High School Robotics

FRC Team 2486 · The CocoNuts · Flagstaff, AZ

TEAM 2486 "The CocoNuts" Present Our 2019 Chairman's Award Submission: "What's Your ECHO?"

Briefly describe the impact of the FIRST program on team participants within the last five years.

We have a 100% graduation rate, with 95% of 'Nuts attending college for a STEM field. However, 2486 provides the opportunity to grow in ways that are more important than a 4.0: confidence, empathy, perseverance, charity, generosity, humility, grit, and optimism. "FIRST has helped me know what I want to do as a career; I have been given multiple job opportunities because I have learned so much." – Logan "I look forward to robotics because while I am there, I am part of something greater." – Jonah

Describe the impact of the FIRST program on your community within the last five years.

2486 is the flagship and model STEM program in Flagstaff, America's 1st STEM City. Our community extends beyond Flagstaff to encompass AZ & NM by being the sponsoring organization of FTC in both states. Because of our commitment, there are FIRST teams at every level on the Navajo Nation and communities across northern AZ. From packing 1000s of food boxes and cleaning our city streets to building robots with visitors from China and sending care packages to our troops, our impact is multi-faceted.

Describe the team's methods for spreading the FIRST message in ways that are effective, scalable, sustainable, and creative.

Growing FIRST requires engagement of youth, schools, communities, sponsors, and policymakers. Our extensive outreach includes demonstrations, professional presentations, hometown parades, and more. One tool is our "Junkyard Robot" challenge, which immerses audiences from elementary students to business executives in the FIRST experience as they are tasked with constructing a driving LEGO robot without any wheels! They experience the triumph of accomplishing something that seems impossible.

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

We embody the spirit of FIRST through our nutty dancing, GP, positive attitude, and the joy we have at every event. We ensure that every competing team is successful, even if it means helping other teams build their robots at competition or stepping in as their drive coaches because they didn't have enough members. After winning their 1st Chairman's Award, Team 6314 said, "We want to express our sincere thanks for inspiring our team to get to where we are today. We think the world of your team."



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Team's initiatives to help start or form other FIRST Robotics Competition teams.

In collaboration with NAU's Center for Science Teaching & Learning and sponsored by Microchip's Steve Sanghi, 2019 is the pilot of our FRC in a Nutshell Professional Development course. Based on FLL in a Nutshell, we empower rookies with skills in grant writing, robot building and team management. We provide continuous long-distance & in-person support throughout the season. The 1st cohort is 6546, 7620 & 7897. Year 2 is approved for advanced mechanics, strategy, sustainability and FIRST growth.

Describe the team's initiatives to help start or form other FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge).

FLL in a Nutshell is a comprehensive guide & hands-on professional development for new coaches. In northern AZ, this has spawned 30+ FLL teams and a FLL Jr program. 75% of 'Nuts have participated on an FLL or FTC team we started prior to joining the 'Nuts. It's being taught by 'Nuts in 2 schools for pay. Our 4-program kickoff event in Sept. helps FLL teams graduate to FTC and FRC teams expand to include FTC. Connecting prospective coaches with rookie grants help start FLL & FTC teams in AZ & NM.

Describe the team's initiatives on assisting other FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge) with progressing through the FIRST program.

Every year since 2011 we've presented workshops on Kickoff Eve in PHX. For 2019, we hosted a season-launch and a guided brainstorming session for 2 rural teams. Over 30 Chairman's Exchanges will be hosted across the country in 2019 alone, providing teams practice and feedback. Our Chairman's Guide has been downloaded more than 10,000 times!! In 12 years we have supported 133 official FIRST events for over 58,000 people, including 63 kickoffs, tournaments and scrimmages that we've personally run!

Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (including FIRST LEGO League Jr., FIRST LEGO League, & FIRST Tech Challenge).

Since 2008, 'Nuts have individually mentored all local FLL teams, totalling 350+ student-hours this year alone! For 11 years, a 'Nut has been named Outstanding Youth Mentor at the Flagstaff FLL Qualifier. Many 'Nuts start their FIRST career on the Sinagua MS Mustangs, then join the 'Nuts and go back to mentor. We mentor many rural FRC teams both in-person and remotely, including 6546, 4985, 7897 and 7059. "It's nice to know that if we need help with anything, you are willing to help." – FTC 8570



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Describe your Corporate/University Sponsors

Long-term sponsors: GKC Geosciences, NAU & WWT
Rodeway Inn: \$2K and hotel discounts for Flagstaff FIRST
Earned \$4000 in Boeing & Altice grants in '19
WL Gore, APS: donates materials, mentors, volunteers
FUSD: event/build space & transportation to in/out-of-state events
Community groups, like Lions Club, sponsor us
Belden: \$5K donation to AZ/NM FTC
Dorrance Foundation: \$2.7K via an AlumNut
Flagstaff Community: \$20K+ annually via Tax Credits
Every donor from \$10-\$10,000 receives a thank you letter

Describe the strength of your partnership with your sponsors within the last five years.

Northern AZ University is our key partner in growing FIRST. They donate venues for both the AZ & NM FTC Champs (run by us), and AZ North FRC Regional (started by us), a donation valued at \$85,000+! We prompted NAU to start four \$24K FIRST scholarships. NAU students & faculty volunteer at FIRST events. Well over 30 students have chosen NAU after competing at an on-campus FIRST event. We say thanks in many ways from sponsor/partner lunches at the AZ & NM FTC Champ to service days at the Food Bank.

For FIRST Robotics Competition teams older than 5 years, briefly describe your team's broader impact from its inception.

Our greatest ECHO is our stewardship of AZ & NM FTC. We have invested 13,000+ hours traveling 47,000 miles to catalyze the growth from 8 teams to 100! We've created a sustainable program by mentoring tournament directors and host teams, running huge kickoffs, innumerable workshops, and fostering our expanding volunteer network. After 6 years of nurturing, New Mexico is becoming their own independent FTC region. Our hard work growing FIRST will be honored at both World Championship VIP Showcases.

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

In all four FIRST programs, students from grades K-12 learn a new way of thinking and problem-solving that will improve our future and our world. Through learning technical skills, such as manufacturing parts and programming robots, we learn to lead, communicate with each other, work under pressure, and set aside differences in order to work towards a common goal. FIRST is passion, positivity, door-opening, and life-changing. Our grandmas are wowed by the robot and proud of the people we become!



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

In 2019, we're playing a vital role in Flagstaff's year-long celebration of our Lunar Legacy contribution to the Apollo Moon missions. We're building a rover to showcase at the STEM Celebration, July 4th parade, Festival of Science and local NASA test sites. The events will host international dignitaries, including a Moon-walker! CHS is hosting a live NASA downlink call to the ISS. We're running an FLL/FTC Invitational this summer; teams will test their robots where NASA tested their Lunar Rover!

"If you want to make the world a better place, take a look at yourself and make the change."

— M Jackson

Imagine standing on the edge of the Grand Canyon. Your breath is taken away by the beauty and the impossibility. It's cliché, but you can't help it... you take a deep breath and yell ECHO at the top of your lungs! You wait holding your breath until you hear it... your voice returning from across the abyss. You hear another voice carried on the wind from the far side. You thought you were alone on this vast precipice; now you know there are others experiencing the same joy as you.

An echo is a sound reverberating after the original has stopped. The CocoNuts vow to make a resounding impact on everyone we meet, leaving a legacy that will reverberate for years to come. ECHO is an acronym for Empathy, Charity, Humility and Optimism. 2486 is eager to share our ECHO with you, highlighting our accomplishments and bringing life to the 'Nuts who live it every day.

EMPATHY: Showing awareness for others and their situation.

"Empathy is about finding echoes of another person in yourself." — M Hamid

Desperation, hopelessness, exhaustion, tears & lack of progress defined our rookie *FIRST* season. We would have given anything for some guidance, but instead we were isolated and alone. We persevered and made a vow that no team in our area would go through what we went through.

Although AZFIRST offers many grants to rookies, many disappear after a few years; lack of adequate mentorship, funding and administrative support are the biggest factors. In response to these obstacles, we partnered with the NAU Center for Science Teaching & Learning to create a



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professional development program, particularly in schools with high needs and student populations that are underrepresented in STEM. Our main goal is to build competitive, sustainable robotics teams and create a network of support between participating schools, specifically the recipients of the AZFIRST/Sanghi Foundation grants. This pilot initiative will be evaluated against other rookie teams at the end of the season.

The first cohort has completed successful grant applications, built & programmed a robot in a day and participated in our Kickoff brainstorming & strategy session. More importantly, each of these teams has our support and guidance throughout the season. They work with us at our build space and we travel to them: we won't rest until these teams have a successful rookie season! "When we went to Navajo Mountain during the build season, it was amazing to see how isolated they are and how bringing STEM into their community could make a huge difference for every student." – Baylee

We realized early the importance of building a foundation of *FIRST* for younger students. Eleven years ago we started *FIRST* Lego League in Flagstaff, and have been hosting and running the Flagstaff Qualifier every year since. In addition, we take a crew to run the other NAZ qualifiers every year. "Despite being new to LEGO programming, I helped the Galaxy Girls with their programming at our Meet the Field Day. I later volunteered at the Prescott Qualifier where I was thrilled to see them earn the Core Values award." – Erick

Our vow to build sustainable *FIRST* teams means our season extends into summer with our student-designed FLL summer camp. It was later transformed into our comprehensive "FLL in a Nutshell" curriculum that has been taught at *FIRST* Headquarters, Dine College and Little Singer School on the Navajo Nation. In collaboration with our city and county school districts, teachers can take a 2-day training for professional development. FLL in a Nutshell was the inspiration for our FRC pilot program. Our experiences drive us to impact coaches and teams in a way that amplifies our ECHO.

CHARITY: Giving time and resources to others selflessly.

"We can't help everyone, but everyone can help someone." – L Scott

We quickly earned a reputation for assisting other *FIRST* programs in our state. In 2009, *FIRST* asked us to manage the dying AZ FTC program, then NM FTC in 2013. Supporting this season's 100+ teams and 11 qualifiers is challenging because of the vast size of our region, over 240,000 sq. mi. The planning committee consists of 2 affiliate partners (our coaches) and 10 other adults that are the lead volunteers at events in our region. Not only do we manage the FTC programs for both states with our time, energy and manpower, we administer all funds from entry fees so we can buy awards, fields, electronics, and other necessities for events.

We begin each season by running Kickoff events in PHX and ABQ for 700+ attendees and dozens of interactive workshops: our AZ Kickoff is the 2nd largest in the country! At first, we developed and ran all the workshops, but as our ECHO began to resonate within the FTC



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community, many teams developed their own workshops to offer their expertise. In conjunction with our support, teams now support each other, and the community grows stronger. We replaced scrimmages with Meet the Field Day to relieve the stigma of “not ready,” which was in 7 locations in 2 states this season. Our joy comes from watching teams we’ve empowered succeed.

At new FTC events, the ‘Nuts arrive in full force to train local volunteers. We gradually decrease the size of the ‘Nut crew, allowing the newly-trained volunteers to take the reins. We lead by example, immersing ourselves in a team’s experience, from when a robot first moves to celebrating the winners. After 3 years, only planning committee members need attend qualifiers, bringing materials and equipment to run the event. This year, 8 of 11 qualifiers were completely “Nut-free” and independent!

The finale of the season is our dual-state, 2-division Championship. One of the largest events in the country, hosted at NAU, it’s a true celebration! This year’s event will host 48 teams. This is where we really shine: putting on a high energy, professional, memorable event. The AZ & NM Championship has gained a lot of recognition from *FIRST*; we’ve had many VIP guests, including *FIRST* President Don Bossi.

Because we grow 30% annually and run a high-quality program on a minimalist budget, our coach was asked to share about our regional model at the *FIRST* Global Partner Conference. Our spirit, enthusiasm and generosity are well-known in the *FIRST* community, but our true pride and joy is the change seen in others that is echoed back as we help to build *FIRST*.

HUMILITY: Having a right view of oneself.

“To share your weakness is to make yourself vulnerable; to make yourself vulnerable is to show your strength.” – C Jami

Even the best can become victims of their own success. After eleven consecutive tickets to Championship, many ‘Nuts – even the community – began to rest on our laurels, losing sight of the fact that our success was the work of many that came before us. Many forgot that WE is more important than ME, all roles are significant, words can hurt, and teaching others is more powerful than acting on your own. Reflecting on our past season was a wake-up call: for us to change, we first had to look at ourselves.

We were determined to concentrate on redefining our team. Each ‘Nut was asked to write down our values to construct a code of conduct. We adopted the “Character Matters” ideals: competition, chemistry, character and competency. ECHO is now integrated into our daily actions. Once we felt satisfied with the foundation, we accepted new members into our team. Here are what new members say:



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"The 'Nuts have made a significant impact in my life, leading me to become a better person in general." – Jonah

"When I joined the CocoNuts, I was blown away: we help others more than ourselves and expand *FIRST*. I'm learning a lot from the team, I'm a proud 'Nut.'" – Owen

OPTIMISM: Hopefulness and confidence about success.

"A pessimist sees the difficulty in every opportunity; an optimist sees the opportunity in every difficulty." – W Churchill

Despite the obstacles we've faced, we remain hopeful for the future and determined to continue our mission. Permanent change requires support at the federal & state levels. In 2017, we were AZ's 1st delegates to the National Advocacy Conference in DC. We learned how to advocate for *FIRST*, conduct meetings with legislators and network with other teams. In addition, we formed partnerships with John McCain, Jeff Flake and Tom O'Halleran to support *FIRST* nationally. Using what we learned, we organized a *FIRST* Advocacy Day at the AZ Capitol. Delegates from across the state attended workshops, displayed robots on the Capitol lawn and met with their legislators. In February, we are presenting to the House Technology Committee on the student impact of *FIRST* at the request of AZ Rep. Bob Thorpe.

When we call out to our sponsors, they respond with funding and support: 1/3 of our operating budget comes from families via the AZ Tax Credit program. CHS provides space for *FIRST* tournaments, hosting 100s of teams at our High Altitude Robotics Extravaganza! In addition, Flagstaff USD sponsors our transportation all over AZ & NM. We have access to our school's Makerspace lab, which utilizes industry-standard machines. We brought the hard work of STEM coaches to our school board's attention; now, they are working to include coaches at all levels in their new stipend scale. NAU is collaborating with the 'Nuts to build a state-of-the-art STEM center that will also support a community FRC team.

Partnerships are a two-way street. We thank our sponsors by sending personal letters & pictures at the end of the season, displaying their logos on all media and hosting a VIP luncheon at the FTC Championship to honor their impact.

So what is the CocoNuts' ECHO? As we reflect on our team's mission and accomplishments, we ask, "What will we leave behind?" Empathy toward coaches to support and sustain them, Charity to every team no matter the distance, Humility in every situation and Optimism despite the obstacles. This is our mission. This is our ECHO!