



COCONINO HIGH SCHOOL ROBOTICS

FRC Team 2486 · The CocoNuts · Flagstaff, AZ

1. Briefly describe the impact of the *FIRST* program on team participants with special emphasis on the current season and the preceding two to five years

Donning the distinctive red shirt transforms us from ordinary high schoolers to passionate FIRST superheroes! FIRST is a platform to hone skills, turn dreams into reality, and connect classroom concepts to the real world. We gain confidence and leadership via experience, success and failure. CHS is 56% minority, yet 100% of Nut Grads have gone on to college, most with scholarships. After retiring the red shirt, AlumNuts continue to inspire by coaching, volunteering, and serving their communities.

2. Describe the impact of the *FIRST* program on your community with special emphasis on the current season and the preceding two to five years

UNITY in CommUNITY is our source of strength and motivation. Our community is constantly evolving, embracing the people we've had the privilege of helping. Near to far, A to Z, if someone calls for aid, we fly to the rescue! From packing thousands of food boxes for Flagstaff's homeless to teaching visitors from China to build robots, our impact is multi-faceted. Our reward is awakening this power in those we reach, expanding our community to include more heroes to do the great work of FIRST.

3. Describe the team's innovative or creative method to spread the *FIRST* message

Since April 2017 we've done 24 outreach events, reaching almost 32,000 people! We are constantly working in our community and beyond as champions of the FIRST message. Not only do we promote the cause locally, but also at the state and national level. The Nuts were the 1st AZ delegates at the FIRST National Advocacy Conference in DC, and started the AZ Advocacy Day at our Capitol. Teams across AZ attended to learn how to effectively communicate the importance of FIRST to their legislators.

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

Superheroes represent the best of what is possible. We are the go-to team for help at competition. We loan parts, help teams go from box to bot, but rather than just "swooping in to save the day," we empower them to persevere. We are friends, counselors, and teachers. Volunteering is where we shine. Teams attending our FIRST events see pride, dedication and spirit in our positive attitudes, nutty dancing, and the joy we have in putting on a great event. Other teams aspire to do the things we do.

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

Through personal connections with universities and numerous outreach programs across the state, we helped start 8 FRC teams across the southwest. We demonstrate all levels of FIRST programs at each event to pique interest for new teams. We have a partnership in the works with the NAU Foundation and Steve Sanghi of Microchip to create a program to start, mentor, and sustain new FRC teams in AZ. Based on our FLL in a Nutshell, this plan includes continual support for the first three years.



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6. 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 training, teaching mentors the fundamentals of FLL. This has started 28 new FLL teams and a FLL Jr. program for all interested FUSD schools. The curriculum is being taught at a local elementary school during the school day. We run a four-program kickoff event in Sept. with trainings to help FLL graduate up and FRC teams expand to include FTC. Connecting prospective coaches with rookie grant opportunities help start FTC teams across the state.

7. 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

Our initiatives support teams in all four FIRST programs. We travel thousands of miles to assist dozens of rural teams. We run numerous region-wide workshops, author the internationally-distributed Chairman's Guide, facilitate the Chairman's Exchange with over 31 events this year alone, and host one-on-one help calls with teams around the country. In the last 10 years we have supported over 110 official FIRST events, including 48 kickoffs, scrimmages and tournaments that we personally ran!

8. 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)

We mentored 350+ hours in '17! Nuts have been mentoring all local FLL teams since '08. Our new Meet-Your-Mentor Day allows Nuts to kickstart their partnership with their FLL coach. We mentor in many aspects including presentation skills, teamwork, and perseverance. For 10 years, a Nut has been named Outstanding Youth Mentor. We teach AZ & NM FTC event hosts, like FTC 8995, who gained "behind the scenes experience" working our FLL event before running their own successful qualifier.

9. Describe your Corporate/University Sponsors

Even heroes need rescuing. Our heroes are sponsors who help us POWER UP! Long-term sponsors are GKC Geosciences, SoftRol, and WWT. Rodeway Inn provides \$5K and hotel discounts for Flagstaff events. WL Gore, APS, and FUSD donate materials, mentors, volunteers, build & event space, and transportation to in/out-of-state events. Community groups like Soroptimist International and Lions Club sponsor us. Belden sponsored AZ/NM FTC for \$5K. The Dorrance Foundation sponsored us for \$2.7K via an AlumNut.



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10. Describe the strength of your partnership with your sponsors with special emphasis on the current season and the preceding two to five years

NAU is OUR HERO! Northern Arizona University is our key partner in growing FIRST at all levels. They donate venues for both the AZ & NM FTC Championship (run by us) and AZ North Regional (started by us), a donation valued at \$85,000+. We partnered with NAU to create 4 FIRST \$24K scholarships. Numerous NAU students and employees volunteer at FIRST events yearly. To say thank you, we put on events such as the robotics challenge for Belden, our showcase dinner and service days at the Food Center.

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

Our most urgent signal for help was from FIRST to save FTC in AZ & NM. This gave us an opportunity to invest 10,000 hrs traveling across 240,000 sq.mi to catalyze the growth of FTC by nurturing new tournament directors and host teams, running huge kickoff events, innumerable workshops, and fostering new heroes in our expanding volunteer network. With grit, this exhausting endeavor yielded 95 teams from 8, allowing us to have 9 qualifying tournaments and one of the USA's largest championships.

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

It has been said that the robot is a machine to build the people who change the world: this is what defines FIRST. Through learning technical skills, such as manufacturing parts and programming robots, we learn how to communicate with others, work under pressure, and set aside differences in order to work towards a common goal. FIRST is passion, positivity, and life-changing. Our grandmas are wowed by the robot and proud of the people we become.

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

We've found a new hero in the AZ School for the Deaf and Blind. We're combining our superpowers to develop a pilot program to modify FIRST programs to be more accessible for students with visual and hearing impairments. We judged their inaugural robotics competition at their science fair, and are collaborating with the FIRST Diversity and Inclusion Dept. to develop this, which will feature new accessibility features so they can interact with the robot. It will be emulated in schools nationwide.



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History remembers those that make change far beyond a single event, score, or robot. Superheroes exemplify persistence, humility, determination, and courage. We strive to empower others, inspiring change to create a brighter future. Being a CocoNut means being a superhero – a beacon of hope – for all.

We are the CocoNuts; this is how we GO NUTS!

"G" is for Growth of FIRST

All superheroes have a pivotal moment: stick to the status quo or become something greater. For us, that happened when FIRST asked us to sponsor and coordinate the AZ-NM FIRST Tech Challenge program. The idea of our team being in charge of an entire program for two states was terrifying! We discovered growth can't happen overnight; it takes time, passion and dedication – superheroes don't have an off-season!

As heroes, we are teachers, mentors & role models. At new FTC events, our weekend looks like this: piling into a bus Friday afternoon, training key volunteers, reviving misbehaving robots and helping teams go from a box of parts to a working bot...THEN the tournament starts! Over 3 years, the size of the Nut crew gradually decreases, allowing the newly-trained local 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. As a result, the AZ-NM FTC program has grown to nearly 100 teams due to 1000s of energetic man-hours & miles.

AZ & NM cover 240,000 sq. mi! With rural communities separated by hundreds of miles, supporting 100 teams is a challenge. We began this season by running kickoff events in PHX and ABQ, featuring 600+ attendees and 10 workshops from programming to fundraising; our AZ Kickoff is the 2nd largest in the country! But it's more than the game; it prepares teams and strengthens the FTC community. Both kickoffs start with a meet-and-greet for teams to collaborate so they feel comfortable reaching out to others.

For the past two years we've replaced scrimmages with Meet-the-Field Day (MTF) to relieve the pressure of competition. This season MTF was in 6 locations in two states. Our joy comes when we watch teams we've empowered succeed. One example is FTC 12767: they came to MTF with a box of parts, built a working bot with the help of a Nut, and went on to win their first qualifying tournament!

"O" is for Ongoing Projects

Early in our history, teams expected us to be a "flash in the pan" – a team that would do great things and then fade. It's tempting for heroes to turn away from adversity, but not us! We aspire to inspire others to expand all FIRST programs and we're proud of it!

Zach S: "When I was in 4th grade, a Nut helped me transform ideas into code. Once I became a Nut, I mentored the same FLL team I was on. It's inspirational to see kids in the same position I



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was, knowing they look up to me. Hopefully they become Nuts and continue the 'Circle of FIRST.'"

His story is one of many. Since we began FIRST in Flagstaff, we've mentored all local teams. At our inaugural Meet-your-Mentor Day, we paired Nuts with 13 teams to assist in all aspects of FLL. We also celebrated our 10th annual FLL qualifier. We become family to our teams; one Nut even traveled to the AZ Championship to support her team the day after she returned from Europe!

Our FLL season extends into summer with our student-designed, week-long summer camp; Camp COCONUTS 1.0 focuses on programming, and 2.0 incorporates mechanical design. Logan: "On sumo wrestling day, my team built an awesome robot and made it to the finals! It was amazing to see their faces light up when they realized their potential." We become heroes in the kids' eyes, cultivating the next generation of STEM innovators and promoting FIRST.

We transformed Camp into FLL in a Nutshell, a comprehensive FLL guide. In collaboration with our city and county school districts, teachers can take a 2-day training for professional development. It's been taught in NH, Diné College on the Navajo Nation, Puerto Rico and FRC 166's summer program.

Each year, we attend innumerable outreach events, spreading awareness of FIRST and our team to the community. This allows us to start teams, gain sponsors and partners, recruit mentors and volunteers and connect students to teams. Results of our outreach extend to infinity and beyond, leading to more teams than we can count after 10 years. Our team has become one of the most recognizable icons of STEM; we commonly hear "Hey, it's the CocoNuts!"

"N" is for New Initiatives

Our perpetual programs have been wildly successful, but we're always looking for new ways to spread our message.

Embry Riddle Aeronautical University (ERAU), a FIRST scholarship sponsor, was ready for the next level. We connected with an ERAU student and worked with the university to host Prescott's first FLL tournament. We also partnered with ERAU in starting community FRC team 7059 by providing a \$1000 sponsorship and assisting them during build season. Prescott has long been ready to grow FIRST, and we're glad to provide the spark.

As our reputation grows, so do our calls for support. Coconino Community College & the AZ School for the Deaf and Blind (ASDB) approached us, asking for our assistance in growing FIRST: CCC offered us a grant to bring STEM to rural areas near Flagstaff with a goal of creating sustainable FIRST programs and ASDB to create accessibility options, allowing students to participate in robotics.



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For permanent change, we need support at federal and state levels. This summer, we were AZ's first delegates to the National Advocacy Conference in DC. We learned how to advocate for FIRST, conduct a productive meeting with legislators and network with other teams around the country. In addition, we formed partnerships with Jeff Flake, John McCain and Tom O'Halleran to support FIRST nationally. We took what we learned to the AZ Capitol and organized a FIRST Advocacy Day. Delegates from across the state attended workshops, demonstrated robots on the Capitol lawn, met with their local legislators, and observed a legislative session.

"U" is for Unity

This year, we refocused our mission, realizing that unity comes from within. Recognizing the talents of each member lets us continue our mission through the ups & downs. A strong foundation enables us to make personal breakthroughs and support each other in the process, expanding our horizons beyond what we thought was possible. Communication, trust & positivity allows us to support one another.

Kaimlie: "When we went on a 7-mile hike, I fell behind. Mr. T stayed with me, encouraging me to go at my own pace. Once I made it to the top, the team celebrated my success. I learned that although you may fall behind, you'll still make it if you try. It taught me to not be afraid to be me; I can make it too. That's something I'll never forget."

Tristan: "We spend so much time together that we have melded into one big family, something I've never experienced before."

"T" is for Transformation

Transformation of a hero occurs internally & externally; as we grow, we continue to accelerate STEM culture in our community through FIRST.

As the "poster child" for America's First STEM City, the Nuts are at the heart of the mission to bring STEM to every child in Flagstaff. Flagstaff Festival of Science invites the community to explore Flagstaff's rich history and contributions to STEM by celebrating "the best 10 days of the year." This year, City Hall featured our robot in a STEM display and declared Sept. 19 "FUSD STEM Day." To celebrate Flagstaff's contributions to the Apollo program, Lowell Observatory and NASA are hosting a year-long celebration of the 1969 Moon Landing and will feature a lunar rover constructed by Nuts; this will be attended by people from around the world!

A new partnership will allow us to enhance our mission to develop FIRST on the Navajo Nation. This spring we will teach our curriculum to the faculty at two Navajo schools and assist them in starting new FIRST teams. Their STEM coordinator will be an amazing ally helping us integrate FIRST into their "Code Talkers" programming, which will give students the chance to do FIRST in a culturally relevant way. Through our efforts and perseverance we've helped establish 3 FRC, 1 FTC, & 8 FLL teams on the reservation.



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"S" is for Sustainability

A hero's foundation is reinforced by their allies. From parades to City Hall, we're constantly interacting with our community. Numerous long-term and in-kind sponsors assist us throughout our season, from raw materials to food fit for superheroes!

Due to persistent outreach, mentoring and STEM education efforts, 1/3 of our funding comes from individuals via the AZ Tax Credit program. CHS provides space for FIRST tournaments, hosting over 45 teams in a single weekend at our High Altitude Robotics Extravaganza! We advocated for computer science & digital design courses at our high school, a dream that became reality. We utilize industry-standard machines in our Makerspace lab to draft and manufacture our robot. W.L. Gore helps us with specialized tooling.

NAU donates venues for FTC Championship and AZ North FRC Regional. Their generosity lends strength, credibility and excellence to events we run. NAU is collaborating with the Nuts to build a state-of-the art community STEM center that will also support a community FRC team. FUSD provides our build space, competition venues and transportation all over AZ-NM. 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.

Partnerships are a two-way street. We thank our sponsors by sending them personal letters and pictures at the end of the season, displaying their logos on all media and hosting a dinner to give them a glimpse of their impact.

"As we express our gratitude, we must never forget that the highest appreciation is not to utter words, but to live by them." - JFK