

Chairman's Award - Team 498

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2020 - Team 498

Team Number

498

Team Name, Corporate/University Sponsors

Bechtel/Arizona Diamondbacks/Custom Data Engineering/DriveTime/SOAR/Peoria Unified School District/Arizona State School Tax Credit Donors/Jack & Connie Graves/Molnar Family&Cactus High School

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

"Robotics taught me a lot about things related to software engineering, but also time management and keeping up with deadlines (life skills for the future). I met some wonderful people in robotics who I felt changed me for the better." - Randy P., Alumni -100% of alumni have attended college or served in the military within the last five years -75% of alumni are in STEAM fields -63% of alumni have volunteered in FIRST since graduation -100% of current students want to pursue a career in STEM

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

-5,475 hours of outreach, showcases, community service, and demonstrations in 2019-2020 -25,700 total hours of outreach, showcases, and demonstrations, and community service from 2015-2019: sponsorship demonstrations, teach engineering, community demonstrations, Feed My Starving Children, FIRST competitions, Christmas in July, cleaning up our community, bulk trash clean up, donating Halloween candy, helping teachers, helping set up for assemblies, and running booths at school festivals

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

Our outreach emphasizes more than just engineering. We incorporate athletics with our t-shirt shooter, baseball shooter, and the STEM dugout at Arizona Diamondbacks games! We keep up with the youth by running popular social media accounts with 1500+ followers. We published resources for teams around the world online. We have been featured on 5 different news channels and a radio station! We have simple craft projects that incorporate STEM concepts for Title 1 schools and the Children's Museum.

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

"When our leadership in robotics went to teach kids about STEM, it was so rewarding seeing the kids get so excited about it and getting to learn more about robotics and STEM." Katy, Alumni -"It was a great experience and me and my friends talk about and use the skills we learned in the class." Abigail, 6th grader -We are from the smallest school in the area, we are also considered Title 1. -We strive to provide kids in poverty a place in FIRST, serve our community, and interact with everyone.

Describe the team's initiatives to help start or form other FRC teams

"Team 498 introduced us into FRC. Cactus taught us the basic skills of engineering, programming, media, and practiced Gracious Professionalism. They have set us on the right path for this year!" Jocy, Team 7547 Member -Aided in starting FRC Team 7547 -- Hawkinators -- we shared build space, our members taught programming, how to write chairman's, lent tools, machinery and parts, guided them through game strategy, helped them during competition in the pits

Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)

"I used the knowledge I learned from programming many robots from scratch to make the momentous task of learning programming for the first time easy and approachable for newcomers." Jack, FTC Director -Started FTC 12901 and FTC 14886 -Started engineering classroom that modeled FLL Jr. fabrication with FLL drag drop programming -Communicated with Sky View Elementary School to start up an FLL team in central Peoria (which will be the fourth FLL Team in our school district)

Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

-Hosted, ran, and volunteered at FTC Qualifiers 4 times in the last 3 years -Allowed for FTC teams to contact us through social media for questions or assistance -Assisted FLL 7156, 6921, 3040 -FTC 1351 shadowed us so they can start, run, and host their own FTC qualifier -Practice days for FRC 2403, 1011, 2375 -FRC Strategy Days for 6479 and 7547 -FRC Mock Kickoff for 2662 and 6479 -Hosted Kickoff for 6479 -Compass Alliance Tag Team and Help Hub -Hosted and ran Duel in the Desert since 2017

Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (includes Jr.FLL, FLL, FTC, & FRC teams)

-"Mentoring the FTC teams allowed me to gain the skills necessary to support teams in need from all across Arizona at our qualifier events!" - Caleb, Student -Mentored FTC 12901 and 14886 -Writing a robotics and automation class curriculum that models/is FTC -Wrote elementary school engineering curriculum with FLL Jr. building and FLL drag-drop programming -Mentored FRC Team 7547, Hawkinators with programming, chairman's essay, game strategy, helped them during competition in the pits

Describe your Corporate/University Sponsors

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

We offer sponsorship packages, provide advertisements on our website and robot, showcased for our sponsors, presented to sponsors about FIRST programs, built a baseball shooter for our sponsor, and traveled to worlds and various competitions with them to watch us compete. Bechtel sponsors us as they "pride themselves in supporting teams that have diversity in demographics and experience. They (us) have older members teaching younger members in their area of expertise."

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

FIRST is an organization where people can all come together to unify and collaborate through a love for STEM no matter what age, language, and background. From age six, children can get real hands-on experience in engineering, technology, business, and so many other career fields. You can be a member of FLL Jr., then grow up and mentor children who started just like you did. FIRST prepares children with necessary life qualities such as teamwork, responsibility, reliability and problem solving.

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

-We are an older team, but this doesn't mean we are who we were 19, 10, or even 5 years ago. In these past three years, we have been implementing new initiatives, more outreach, and newer methods to be effective FIRST members. - Sustainability is not about growing in size or numbers. Change is gradual and by having smaller programs, it pilots student interest, as well as solidifies members. After cultivating interest, we can start an FLL, FTC, or even FRC team with necessary funding.

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

In 2000, we focused on the fundamentals of sustainability within our team. As Team 498 thrived, we attended more competitions and developed greater engineering skills. After competing at FIRST Championships, we developed interpersonal and business skills. Within the past three years, we went from running one team to founding two additional teams; from building ourselves locally to mentoring and assisting teams from across the world; from running no outreach, to over 30 events per year!

Team Captain/Student Representative that has double-checked this submission.

Van Nguyen

Essay

CHAPTER 1

In which we're introduced as Team 498, The Cobra Commanders, & our journey begins:

Once upon a time, 20 years ago now, we wandered around in the unknown woods filled with treasures. Then one day, Team 498 was founded in the humble city of Glendale, AZ just beyond these woods. Since then, we've gained new friends, experiences, & missions. With our friends in FIRST, we continue our adventure on the FIRST journey.

CHAPTER 2

In which the Cobra Commanders go traveling & arrive at a familiar place:

At Chase Field, our robot shot the first pitch at an Arizona Diamondbacks MLB game in 2018, after they personally requested we design & build a first-pitch robot. That day we also demoed at the stadium's "Science of Baseball Night," just like we've done since 2016! To date, we've reached over 83,000 fans! However, this year, it was more special; we were invited by The Arizona Diamondbacks to demonstrate at every single home game in the 2020 season through their STEM dugout, where we show kids what FIRST is all about! We're able to showcase to over 2,215,000 baseball fans to show what FIRST can do for the youth & community. However, our involvement in sports doesn't stop there. Every Friday night, at our varsity football games, you will see our t-shirt cannon robot on the track, ready to celebrate each touchdown! Because of this we've reached roughly 9,737 people at Cactus High School & are an integral part of the Cactus spirit & tradition.

Additionally, our favorite events to demonstrate are at conventions! Conventions translate into meeting people of all ages & backgrounds! We encourage people that we meet to start or find their local FIRST programs by handing out pamphlets & flyers about all four levels of FIRST. Phoenix Comic Con brought in over 57,850 people from all over the United States, while the Arizona SciTech Festival over 450,000 people in attendance in 2018! In 2016, there were 380,000 at the SciTech Festival & 21,6210 at Phoenix Comic Con, which were both major events for the Cobra Commanders!

We believe in the power of media as the world is constantly evolving. We've gained over 334,600 listeners during our time on local radio stations. We've been featured on television to over 1.9 million+ viewers from Arizona PBS, 12News, Fox 10, AZ 3TV, & Glendale 11! However, we aspire to inspire even more people, especially our youth!

CHAPTER 3

In which the Cobra Commanders go hunting for recruits:

Ever since the beginning of the team, the Cobra Commanders have always worked to reach out to younger audiences.

We walk & drive our robot around our school's neighboring streets for our homecoming parade every year to over 1,800 people! In the last five years alone, we've presented at elementary schools all around our community and district, demonstrating to 2,540 kids! We also demonstrated to preschoolers at our high school. We demonstrated to 900 people at Title 1 elementary schools' STEAM Nights for the past 2 years. At our high school's STEAM night, we partnered with our district's CTE program, local businesses, & local college! At these STEAM/STEM Nights, kids can have an opportunity to take pictures, videos, & drive our robot, and we build partnerships with businesses, colleges, and community members. While the kids are interacting with the robot, parents are provided an opportunity to talk to us & discuss a future for their child in FIRST!

CHAPTER 4

In which the community needs help & the Cobra Commanders serve to help:

Our community has done so much for us, so in 2017, we started a community service initiative. One small action can have a great impact. In December 2019, our school adopted a child's medical expenses through Sparrow Club. For every hour of community service, Beckham (the child) gets \$10. Our members have also volunteered at FIRST events from FLL, FTC, & FRC! During competition season, we volunteer to help set up the field prior to competing. In the past five years, we've set up the fields at both AZ Regionals! However, this isn't to fulfill a quota. There is not a community service requirement for the team, but rather this is because we want to be a part of something bigger than ourselves. Members have individually averaged over 180 volunteer hours per year. Whenever the community calls, they can surely expect the Cobra Commanders to be ready to help with anything that comes up.

CHAPTER 5

In which the future meets the present:

3 years ago, Cactus High School founded an engineering class that has close ties with the robotics teams. Back in 2018, we fervently advocated our school board about the importance of an engineering classroom. This would allow students with interest in robotics, but have after school commitments, to have an outlet to formally learn engineering concepts! As a Title 1 school (over 40% of students live at or below the poverty line), we're providing students with skills for their future careers. Over the summer of 2018, we renovated our 2 classrooms to form a large classroom — one side filled with computers & technology to CAD, present, & learn while the other offers machinery & tools for a variety of projects. Cobra Commander members also helped to write the curriculum which modeled FTC! They taught lessons about fabrication, documentation, & programming in Java. Last school year, we only had 20 students in engineering. However, today, we needed multiple class periods of engineering due to demand, & have successfully lobbied for our school to add official programming & engineering teacher positions. Last year there were 60+ students in the engineering program!

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In the 2020-2021 school year, we're evolving our engineering classroom into a robotics & automation classroom, and we are working to create another new FTC-based curriculum to facilitate this evolution. Students will fabricate, program, wire, & complete an FTC robot ready to compete. Currently, over 90 students have enrolled in the new course! The class will be the only robotics class in our entire district. The class is offered to students of all grades & because we're partnering with a local college, it will be offered as a dual enrollment class. This will allow students to earn college credit through Estrella Mountain Community College while still in high school.

At Pioneer Elementary, we started an engineering class for 30 students that live in the foster care system or are in special needs from 3rd through 8th grade to provide these kids an avenue into STEM! Pioneer is a Title 1 school (like us), so our mission was to write a curriculum that was cost-efficient & simple for all ages. We wrote curriculum modeled after STEM concepts including an egg drop, a simple pneumatics system, brush bots, drag-drop coding, & LEGO designs! This mimics FLL, but in a cost-efficient method of spreading FIRST & STEM! One day, we hope to expand this classroom to schools around the school district.

CHAPTER 6

In which the Cobra Commanders get presents:

On one Saturday morning in a cool September, the Cobra Commanders received a present; 2 new FTC teams! We started & mentored FTC 12901 in 2017 & FTC 14886 in 2018! In addition to starting & mentoring FTC teams, we host, run, & volunteer at the FTC Glendale & Duel at the Qualifying Tournament. In the past 3 years, we hosted 4 competitions & reached roughly 5,000 people at these events. With an FTC team, we're involving a wider age range of students we can reach & teach & prepare for their futures.

At our 2019 Duel in The Desert, the only off-season event in the state of Arizona, we also featured competitions for all four FIRST programs. This was the first time in Arizona history that all four programs came together under one roof. This year, in response to the build season changes, we've transformed Duel to host 3 Arizona Open Practice Field Days before competitions! We're involving our school's building trades class as they are helping us build the field this year! We're one of only 6 teams in the western US & the only Arizona team that is part of the Compass Alliance, which frequently partners with FIRST HQ to provide vital help & resources to teams around the world. As Compass Alliance members, we serve as a tag team & help hub for other FRC teams. Last year, we mentored FRC Team 7547 — The Hawkinators — throughout their build season & during AZ regional competitions. We hosted their team on our campus & shared our engineering room for the design, construction, & programming of their robot. Additionally, our chairman's team gave them guidance in preparing their own submission. In 2016, we created a custom drive train for Dragon Robotics. In 2018, we built a crate & shipped RoboKrew's robot to the World Championships & transported The Bit Buckets' tools & materials from Arizona to Houston! Most recently, we hosted 2 mock kickoffs & kickoff events for 2020 & included the members of FRC Team 6479 & 2662! We shared resources, analyzed the game manuals, created archetypes & ran game simulations. In addition to preparing teams for the season, we facilitated a strategy day for those teams to help identify goals & objectives for their season. However, our mentorship extends beyond Arizona's borders! In 2018, we mentored through the FIRST Global Challenge for Team Bermuda! We frequently Skyped & offered our technical expertise in programming & electrical fields.

CHAPTER 7

In which the Cobra Commanders look to the future:

Our mission has changed over the last twenty years to focus on forming and maintaining reciprocal relationships with sponsors, schools, and community partners, providing resources and assistance for STEM programs state-wide, and to creating engineering and robotics education opportunities for students in our community, with a focus on Title I Schools like ours. We've never given up, & we never will. As this story comes to a close, the youth we inspire & the others who go on to have successful careers from FIRST & the STEAM field will be teaching the next generations.