

Chairman's Award - Team 5414

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2020 - Team 5414

Team Number

5414

Team Name, Corporate/University Sponsors

NASA/BNY Mellon/Texas Workforce Commission/Aura Engineering/Primrose of Clear Lake/Jacobs/DOW/Shell/Hayes Carpentry/Southern Product Finishing&Robert Turner Colege-Career HS&Glenda Dawson High School&Pearland High School

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

FIRST turned me, someone with very weak self-image and low self-esteem, into a leader, an innovator, and someone who believes they are capable of being successful in STEM. Being impacted by FIRST has made me into a better person—someone our sponsors want to hire, just like all the students in Pearadox. I'm constantly inspired by our returning alumni who have been so touched by FIRST that more than 50% have come to help us build our field at 2020 kickoff.

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

In just 5 years, we presented our robot at 3 Houston Rockets STEM nights, taught girl scouts engineering concepts, and spent more than 6,000 hours serving the community. We are such a big presence in our community that our city reached out to us to create a smart geocache and fix their police robot. We practice not only impacting Pearland, but building our own worldwide community through the Girls Get Together, an event where we invite women in STEM to connect with girls in FIRST.

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

We have inspired neighborhood kids through our city's annual Christmas parade for more than 3 years now, and it warms our hearts when we hear enthusiastic kids who remember us shouting "look the robot's back!" As one of the U.S.'s fastest growing cities, Pearland's parade has crowds of more than 10,000 people who hear our float announced as "Pearadox, a FIRST robotics team!" It's amazing how the returning audience saw us grow from pushing a robot on a cart to having a professional parade float!

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

Our workspace is often buzzing with rookie and veteran teams working along our students to troubleshoot and test their robots. 2587 remarks how "[Pearadox] stands alone as a team that has constantly opened up their space", and our students don't hesitate to assist other teams, even in the heat of competition; "Pearatroopers" actively seek teams in need of help. Our focus in engaging girls in STEM is contagious, as seen from Pearagon, an FTC team we inspired to run their own girls in STEM event.

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

We played a critical role in events that led to communities starting FRC teams and recruited teachers and mentors to see the rookie teams to fruition. Unfortunately 40% of FIT teams who started in 2014 cease to exist. After seeing FRC 7312 through their inception, competitions, and awards, we realized spreading FIRST was not just starting teams but seeing them through to sustainability. Our FRC PrePEAR Program was built to fulfill this mission and has impacted 30+ teams.

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

We believe kids shouldn't have to wait for high school to be interested in STEM; involving them in FIRST early creates a growing pipeline of students into Pearadox. In 2018 we appealed to our school board to start just one FIRST team in our district. Now, that one initiative has led to us starting 8 FTC and 6 FLL teams. With FIRST programs now accessible to about 20,000 Pearland students, we are transforming the culture of our community to one that celebrates science and technology.

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

We help our sapling teams build strong roots to be sustainable and successful—and they are. In just their first 2 years, they've won 11 awards, making the 600+ hours spent mentoring them more than worth it. We make such an impact on the younger students that 19 were inspired to join Pearadox, which is 34% of our team! We volunteer at all their kickoffs, competitions, and even each other's outreach events, so we get to see how they thrive and continuously grow with the help of our support.

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)

We share ideas for the benefit of FIRST teams in nation-wide teleconferences with other NASA house teams. Similarly, our mentor ran a discussion with the top Houston area teams to set up a network to effectively assist rookie FRC teams. Locally, we run an annual PearUp kickoff event to partner with FTC teams in assisting rookie teams going into build season. We have also worked with one of our FTC teams to start two more in their school.

Describe your Corporate/University Sponsors

From Panera Bread to NASA, Pearadox's impactful mission sparks a want to help in many diverse companies, making our team's funding more sustainable. Pearadox spreads FIRST's mission to companies who never knew of it—like Schlumberger and BNY Mellon. Our long-standing sponsors support in diverse ways—Code Ninjas, a kid coding school, provides an audience to recruit to our pipeline teams; Best Buy is eager to sponsor the printing of our magazine; and Shell donates through employee hour matching.

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

Many mentors work for our sponsors, allowing us to work with some of their women employee networks—Dow, Schlumberger, and NASA—so when we run outreach events like Girls Get Together and Princesses with Power Tools, the attendees can connect with women engineers. That connection impresses our sponsors, who have offered 20+ jobs to Pearadox students. They know when they hire Pearadox students, they are not just giving opportunities to high school students, but future engineers and employees.

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

When describing FIRST to a CEO, congressman, or on television, we describe FIRST as building a family of passionate creators. Comprised of entrepreneurs, artists, and engineers, our family works towards the singular goal of competitive excellence. FIRST offers many opportunities to find multiple solutions to problems and encouraging creativity among teams using robotics. FIRST inspires students to think about their future, and how science and technology may be a part of it.

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

Pearadox prides itself in its ability to teach its students how to be entrepreneurs, and nothing makes us prouder than when we get presented amazing opportunities because of how a student reached out. A girl on our team was so passionate about our magazine, STEM Savvy, that she brought it to our school board. The inspiring project was communicated to the news-service ABC 13, where we were able to showcase STEM Savvy and FIRST on television to Houstonians, the 4th largest market in the country!

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

When Pearadox was born, it was run in a garage by just 7 boys and 3 engineers. Now, our 56 members (16 of them girls) and 17 mentors allow us to reach more than 300,000 people with our mission and initiatives. One of these is a magazine "STEM Savvy" which engages girls in a fun, attractive, and personal way that most media does not. STEM Savvy has not only been spread to over 10 countries and 7,000 people but is translated into Spanish and Chinese to reach these underrepresented communities.

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

Julia Rieger

Essay

Unity and diversity—a Pearadox in and of itself, but on our team, it manifests into a reality. We could not be prouder to have our roots in the city of Pearland, near Houston. According to a study by Rice U., Houston recently surpassed NYC as the nation's most diverse area, and Pearland is one of only two Houston suburbs more diverse than the city itself. Our team reflects this statistic with its 50 members, 17 mentors, 5 languages, and 3 rival high schools brought together by 1 goal. Our team's diversity is not confined to nationality, instead; anyone can discover their niche on Pearadox. Engineers, programmers, artists, videographers, graphic designers, and writers all come together and utilize their passions to propel the team toward an exciting, unified future.

As a rookie FRC team, we lacked the support to realize our goals. Others struggled as well, as 40% of the FRC teams in Texas that started with us in 2014 now cease to exist. To prevent future collapses, we feel it is our duty to pay forward our success by fostering an environment that is more inclusive of younger teams. We call this our PrePEAR Program, consisting of Pear Up, Open Doors Policy, Inspection PEARfection, Pearatroopers, and off-season workshops.

Through Pear Up, our 6th annual kickoff event, we invite inexperienced FRC teams to help them find their footing in the FIRST environment and strategize for the upcoming season. These teams, despite being from different parts of Houston, come together to learn valuable skills from each other. Under Pearadox's mantra of unity and focusing on a common goal, each team shares their unique perspectives which allows for a greater range of ideas to spread; this enables the event's success, growing to include 7 teams over the years. For this year's speaker, Erich, our imagery lead, invited his sister to give a presentation over her work as a software engineer. The topics she discussed were universal and helped prepare students for their future careers.

As one of the 3 full-field facilities in Houston, we have an amazing opportunity to continue supporting these young teams into build season. Our impressive array of mentors, each with a different specialization, combine their invaluable expertise to create a safe place for visiting teams to develop and realize their ideas. Through Texas Active Rookie Partnership grant we spent \$1,500 on the then-rookie FRC team T3 7312 by going on a shopping spree to provide them with the appropriate tools. After this, our team continued its support by welcoming them on our field due to our Open-Door Policy. We also maintained constant communication by adding some of their members to our primary messaging app. We helped them gain technical information about gear ratios, reviewed their chairman's PowerPoint, and answered any questions brought up.

Our efforts to serve younger teams doesn't end with T3. In 2018, before competition season, we also hosted our first Inspection PEARfection for Houston area teams. At this event, less experienced groups had their robots checked by two head inspectors, Kevin Seveik and Lyndon Bridgwater, and were able to scrimmage on our field. We created this program in response to frequent requests for help from teams struggling to pass inspection. 12 teams from all over Houston came together and learned how to make modifications for the competition through the shared goal of self-improvement.

We don't stop reaching out to younger teams after build season. During competitions, our PEARatroopers assist teams in need of technical experience, and actively seek out low-resource groups to level the playing field. Our PEARatroopers have impacted over 30 teams through donating supplies, working hands-on with their members, and building bumpers. Last year, one of our programmers, Kona, after repairing the code for a rookie team, helped them for the rest of the competition. This program allows our unique, talented students to assist other teams in achieving success through their expertise.

Many of our members were never able to join a robotics program before FRC. One of our first initiatives to combat this in our community is our PrePEAR workshop, a one-day program geared toward younger audiences, where students learn about career opportunities from a guest speaker and build a robot to achieve challenges. The PrePEAR workshop assists in recruiting new members to our FLL and FTC teams. When our superintendent, Dr. Kelly, accepted our invitation to attend the World Championship in 2018, he understood to the full-extent how important our program is and immediately made it a district priority to structure a pipeline of competitive K-12 robotics teams. Pearadox has established 8 FTC teams in our junior highs and 6 FLL in our middle schools, and collectively our team has spent 600 hours mentoring them. By planting our love for FIRST in the next generation, we form an organization that is sustainable for years to come.

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Our outreach to younger kids is not only confined to our local area. One of Pearadox's most ambitious projects is publishing our seasonal magazine aimed towards girls called STEM Savvy. Anyssa, '19 team captain, founded the project as a product of her experiences being a young girl interested in STEM. Before FRC, Anyssa never entertained the fantasy of being an engineer. Pearadox was the first place where she could immerse herself in STEM and imagine a future in the male-dominated field. With these experiences in mind, she launched STEM Savvy to ensure young girls would have the representation and encouragement to participate in STEM. Anyssa's efforts and hopes for young girls have been carried on by our co-captain Julia and the team, now with three editions published. The magazine has been broadcasted on the ABC 13 news channel to people all over Houston, which is the 4th largest viewing market in the country. STEM Savvy is free on our Gearbox Girls website and has spread globally through translations into Chinese and Spanish which were completed by our other co-captain, Anna, and Chairmans member Girel.

STEM Savvy succeeds in connecting girls with the idea of STEM. We strive to directly connect girls with professionals through the Girls Get Together (GGT) event. Howdybots and Devastators have joined forces with us at multiple GGTs in order to combat the gender divide in STEM. This is in addition to the 300 girls from 10 countries who have also attended. To expand our web of support for girls in STEM we created DIY GGT— an expansive guide demonstrating how to initiate this project for other FRC teams. By networking with engineers and promoting a more inclusive environment, we encourage girls involved in FIRST to continue their journey towards STEM careers.

Our website Gearbox Girls serves as a medium to showcase our success with such projects, as well as enable others to keep up with our STEM-related girls' events. The site features our magazine, information about GGT, as well as details on our SPROUT app. SPROUT is a project dedicated to involving Texas Childrens' patients in robotics; by providing them with tutorials and facts on tools, we ensure that these underserved youths have an avenue to pursue STEM. We are working to reach not only students, but entire demographics left out of the robotics conversation.

Pearadox is a team that continuously stresses the importance of community. Through STEM, we feel empowered to directly assist underserved and marginalized demographics. We participate annually in the Houston Rocket's STEM night, organized by the NBRPA-legends for inner-city kids. After the event, Pearadox engaged in a ball exchange with the Houston Rockets in front of 16,000 people. In this way, Pearadox and the Rockets united to empower inner-city kids. Another impactful initiative is serving one of Houston's women's shelters. The president of our parent booster club, Mrs. Bright-Moore, was able to connect us to Bay Area Turning Point, offering her home as a place to prepare meals. Our members spent 3 hours preparing a colorful array of meals that included cakes, baked potatoes, corn, and watermelon. Those at shelters have limited access to information directly geared towards women in STEM, so as part of this project we provided our magazines.

Pearadox also impacts the local community. Our efforts have become so well known that both the Alvin Police department and Pearland Parks and Recreation reached out to us for aid. The police department asked us to fix a robot that they use for demonstrations. Pearland Parks and Rec. requested for us to create a geocache so they could participate in the world's largest treasure hunt. However, we took it a step further and designed a smart geocache that requires the seeker to solve a puzzle before they received their prize. Through these endeavors, Pearadox was able to partner with organizations in our surrounding area to create a better community.

Throughout our robotics journey, we continue to grow and mature; our FIRST experiences mold us into the leaders of the future. The skills gained through FIRST-teamwork, critical thinking, and hands-on experience have already been transferred into daily life and tangible opportunities. 5 Pearadox members were granted an internship from NASA, with one continuing in a co-op, on track to be a full-time NASA engineer. It was their experiences with FIRST that impressed employers and gave them the skills necessary to succeed in the workplace. Thus, students' involvement in the FIRST community provides them with a legion of opportunities that help to shape their future lives. Through FIRST, we uplift the underrepresented and underserved members of our community. Through FIRST, Pearadox unites to improve its members through the vast and limitless world of STEM. Through FIRST, our members gain an improved self-image, expertise, and an essential, tight-knit community that they can call home.