

## Chairman's Award - Team 5414

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2021 - Team 5414

**Team Number**

5414

**Team Nickname**

Pearadox

**Team Location**

Pearland, Texas - USA

**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.**

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

We have presented our robot at Houston Rockets STEM nights, taught girl scouts engineering concepts, and spent more than 6,000 hours serving the community. We have such a big presence that our police department asked us to fix a robot that kids can interact with. We impact not only Pearland, but building our own worldwide community through the Girls Get Together, we invite women in STEM to connect with girls in FIRST. We have built our own community that comes back each year to reconnect.

**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?**

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!

**Please provide specific examples of how your team members act as role models within the *FIRST* community with emphasis on the past 3 years.**

Our workspace is often buzzing with rookie and veteran teams working along our students to troubleshoot and test their robots. "PEARatroopers" actively seek teams in need of help; 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. 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 your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.**

We believe students shouldn't wait for high school to be interested in STEM, so we created 8 FTC & 6 FLL teams in our school district. We believe giving them the resources to practice STEM will build their capability and confidence. We have also made it a necessity for our team members to mentor these newer teams to give them the knowledge needed to succeed in their STEM endeavors. With *FIRST* programs now accessible to about 13,000 Pearland students, we are changing the culture of our community.

**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?**

Princesses with Power Tools is our annual event that inspires STEM interests in young girls. We dress up as princesses and introduce our robot to the kids as young as 4. They use tools and build a wood project with our guidance to take home. One girl says as she is working on her project, "This hammer is magical! It makes me feel like a superhero!". These types of confidence building events that our community is looking for us to continue as this was the single most locally sponsored event.

**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**

Seeing FRC 7312 through their inception, competitions, and awards, we realized spreading *FIRST* was not just about starting teams but supporting their sustainability. Our FRC PrePEAR Program was built to fulfill this mission and impacted 30+ teams. Primrose is a dedicated sponsor and, in our partnership, we have visited and done demos there and we hosted their students at our facility to introduce them to STEM and *FIRST*. We have built similar partnerships with others such as NASA and Code Ninjas.

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

We know we are creative, confident, and capable to ensure other girls do too, we created and sustained a magazine, STEM Savvy. We understood there was a lack of media motivating girls interested or in STEM why do boys' magazines feature jobs and adventure while girls' are superficial? STEM Savvy fills that gap. The magazine helped us reach 7000 girls in 10 countries with our Gearbox Girls program in only 3 years, landing in the hands of Gearbox Girls, *FIRST* students, and kids around the world.

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

Through our annual risk analysis, two weaknesses that could hurt the sustainability of our team are the potential loss of money or student interest. To keep the source of our funds diverse, beyond our sponsorships and grants we host unique fundraisers, such as PEARents night out. It is an event that generates interest in our team. Students get a firsthand look at our machine shop, our full side practice field, along with our robot giving kids a special experience they cannot find elsewhere.

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

Many mentors work for our sponsors, allowing us to work with some of their women employee networks like Dow 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.

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

With the recent pandemic of Covid-19 our team has seen a struggle in introducing our new members to our love of *FIRST* and our team. Virtual meetings have made us more disconnected to the fun and interactive parts of the robot. To keep our students engaged and interested we created a google classroom that helps bring in engagement and learning for the upcoming seasons and projects. Our mentor AJ has tried many ways to help the team stay positive through making surveys to keep the members engaged.

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

When Pearadox was born, it was run in a garage by just 7 boys and 3 engineers. Now, our 50 applicants (20 of them girls) and 10+ mentors allow us to reach more than 300,000 people with our mission and initiatives. From creating and distributing our magazine that inspires young girls in over 10 countries and 12 states, to teaching kids about power tools in our own community we inspire students to engage in STEM. A comment from a parent of an event participant, "My son wants to build robots now!"

**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 team advocates for STEM education and engages with our state and local representatives. Our State Representative Gary Moore attended our 2020 Open house. There he was moved by the work our students put in to create our robot and submitted a donation. Our annual Open house is frequented by our mayor, local business owners, and school administrators. This event has become a community event with cake, food trucks, and robot action.

## Essay

Strength and persistence—throughout 2020, a year with its trials and tribulations, Pearadox has shown endurance through these testing times of Covid-19, incorporating virtual events and safely allowing in-person meetings to maintain a stronger connection within our team and our community. Pearadox is filled with determination and resilience to not let this pandemic stop us from maintaining our roots and planting new seeds.

One of our roots is inclusion and empowerment—to help girls who have a desire to pursue a career in STEM. Girls often face an uphill battle in their relationship with STEM because of the prevalent education and workplace gender gap. We countered this issue many girls face, which is a lack of role models that they can relate to, by creating a community on Pearadox called the Gearbox Girls. We are a group of students who are driven to enforce creativity, confidence, and therefore feeling of capability in all girls. The Gearbox Girls website serves as a medium to display our success with girls in STEM initiative projects, as well as enable others to keep up with our STEM-related inclusivity events. We directly connect girls with professionals through the Girls Get Together (GGT) event. The FRC teams Howdybots and Devastators, for example, have attended multiple GGTs, along with 300 other FRC girls from 10 different countries. By networking with STEM professionals and promoting a more inclusive environment, we can encourage girls involved in FIRST to continue their journey in STEM. To expand our web of support for girls in STEM we created the DIY GGT—a thorough guide teaching other FRC teams how to run their own GGTs! The Gearbox Girls website also features STEM Savvy, a magazine created for girls, by girls, which we broadcasted on ABC news in front of over 150,000 Houstonians. The Covid-19 pandemic did not prevent Pearadox from spreading this message of inclusion and empowerment through our Gearbox Girls' program. We host GGT events at FIRST competitions, inviting female professionals to engage with FRC girls. To overcome the Covid-caused restrictions on gatherings, passionate Pearadox girls created the Digital GGT as a panel featuring 20 women in STEM from a variety of fields and companies to speak on their unique experiences with interested girls. 80 participants joined from 20 different FIRST teams, one of them commenting that it was "very inspiring to hear from female engineers and their experience in STEM". By networking virtually and communicating to our audience the importance of creativity, confidence, and capability, we were able to adapt this event virtually and continue our annual event even considering a global pandemic.

Princesses with Power Tools, an event designed to inspire younger girls while showing them the possibility of robotics, brought the GGT initiative to our own facility in Pearadox students dressed up along with 20 little girls to teach them how to use power tools, showcase our robot, and get them excited about hands on work! Delighted parents and confident girls left our robotics room that day, making us students so happy to have influenced younger generations to pursue their goals in STEM through granting exposure to resources often denied to girls and proving that it is possible to possess the elegance of a princess while using power tools!

Pearadox is dedicated to uplifting our surrounding FIRST teams. Pearadox established 8 FTC teams in our junior highs and 6 FLL in our middle schools, and collectively we 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. Pearadox also established a grant program to help our surrounding teams with obtaining supplies and provided each of them with a 3D printer. With the tight restrictions this year we decided to provide tool kits to our FTC teams this season, ensuring they are supplied with new equipment for the upcoming seasons. Pearadox continued to maintain a connection with its surrounding teams and support their survival by communicating with them throughout the pandemic.

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 losses, we feel it is our duty to share our success by fostering an environment that is more inclusive of younger teams. We call this our PrePEAR Program, and we make it our mission every season to seek out other teams in need of assistance to help improve their experience. This program forges a powerful bond between Pearadox and other FIRST teams, establishing ourselves as supporters and promoters of success in STEM. With the 2021 season being virtual, we have struggled to keep up with these events as in person meetings are prohibited. Alternatively, we have collaborated with other teams through various platforms including Zoom, Chief Delphi, and Instagram. This summer we had the opportunity to meet up with 15-20 other teams virtually. Each team had the chance to discuss their robot from the 2020 game as well as the challenges they faced in their designs. Allowing us to interact with other teams and learn from them like in a normal FRC season. Pearadox also hosts a yearly event called Open House, inviting other teams and our community to our facility and offering tours, information, and services to those who attend. At this event, less experienced groups have their robots checked by inspectors and scrimmage on our field. We created this program in response to frequent requests for help from teams struggling to pass the robot inspection. Teams from all over Houston came together and learned how to make modifications for the competition through the shared goal of self-improvement. By displaying our projects and incentives for spreading knowledge about STEM to our community, Pearadox becomes a sustainable outlet in instilling essential skills for the future lives of students including leadership, comradery, and expertise.

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Pearadox continuously stresses the importance of community, empowered through STEM to assist underserved and marginalized demographics through public appearances, community events, and donations. Over the last couple of years, we participated annually in the Houston Rocket's STEM night, organized by the NBRPA-Legends for inner-city kids. After the event, Pearadox engages in a ball exchange with the Houston Rockets in front of 16,000 people. Pearadox and the Rockets united to empower inner-city kids. In addition to STEM night, Pearadox participates in these annual events that include our local Christmas parade, the Trick or Treat Trail, and Houston's Energy Day. This year COVID-19 has canceled these events, so we have refocused our priorities on another key root of our team - helping people who are in need. One of our biggest efforts was providing relief to one of our sponsor's employees' families who were affected by Hurricane Laura in Lake Charles. They were one of many victims whose homes were destroyed from the storm and had to take refuge here in Houston. We hosted a donation drive, Pack the Pearadox Trailer, to gather items such as generators, baby supplies, water, cleaning supplies, and so much more from our members to help these people who are in need. Resulting in over \$5,000 worth of donations. Another effort to help our local community recover from the devastating impacts of covid-19 and the resulting struggles to reliably put food on the table was volunteering at some of the Houston Food Bank drives. One of our members, Natalie, organized team trips to local outdoor chapters of the Houston Food Bank to deliver packaged food to senior citizens arriving at the site in cars. This allowed Pearadox to safely assist those who have been hit hard by the pandemic and have lost access to affordable meals.

With remote interactions becoming the norm, Pearadox has strived to ensure that engagement within the team and its activities remain strong. To train our rookies remotely and assist them in finding their role on the team, Google Classroom was employed to inform newcomers about the variety of subsystems in Pearadox. The platform was also used for CAD sessions, guaranteeing rookies' knowledge in a remote environment. To encourage team interactions, we hosted 5 weekly social meetings at the beginning of the school year on Zoom, ensuring that rookies had the opportunity to foster supportive relationships with members through a variety of interactive games and activities. During the pandemic, our team has maintained our annual tradition of the Pearadogs event, hosted after the competition season. Members of our team gather at Independence Park with their dogs. Keeping social distancing in practice for our last session allowed team members to bond over their love for their furry friends. Pearadox has remained engaged with other teams, showed through our two virtual book clubs open to other teams. Through our array of remote events, Pearadox provided members the opportunity to maintain team connections and interest in FIRST's activities.

The recent pandemic has inflicted turmoil on our team's mission to inspire youth confidence and in supplying resources for STEM; however, it has also provided us with many new opportunities to expand our reach in unique ways. From supplying tool kits to our FTC teams to creating a google classroom for team members old and new to learn about our different subsystems, Pearadox has continuously provided new outlets this year. Today, where connection is everything, Pearadox strives to maintain relations and create new ones within our community and our team. We searched for ways to use the pandemic to our advantage rather than succumbing to its hardships, discovering resourceful methods to spread the importance of STEM while sustaining a passion for FIRST, motivating us to pursue the careers we now have the confidence to follow.