Paly Robotics

FRC 8 | 2020

Sustainability Plan

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Sustainability Plan

Why Sustainability?

Paly Robotics believes that a sustainable recruitment and expansion model is essential to generating a meaningful impact. Sustainability ensures that our team is able to maintain and improve its success well into the future, and team projects and initiatives can be similarly continued and expanded upon. Especially during the COVID-19 pandemic, it is incredibly important to ensure that the team continues to run and work towards our mission of spreading STEAM education in our community, and thus, a sustainable structure is key to addressing and adapting to problems like these when they arrive. and It is with this mindset that Team 8 creates, implements, and fosters its strong system of sustainability.

Lab Conditions

Though Paly Robotics has been working in our school lab since our inception 24 years ago, poor lab conditions could lead to the shut-down or remodeling of our space. To prevent this, we have taken precautions which include a safety inspection administered by Keenan & Associates, and implementing the suggestions from this check such as improving ceiling and wiring. We constantly work to maintain and improve our lab conditions and space into the foreseeable future.

In the unlikely event that we lose our lab, we have made preparations to facilitate recovery and continue our team's activities. We have the support of local FRC teams and maker-spaces which would help provide us with temporary resources, tools, and a workspace. This includes FRC Team #192 and our local MakeX, a free, community maker-space to convene and collaborate. Additionally, our team members helped design a maker-space in our newly reconstructed school's library, which is open to our team.

We have participated in many outreach events, competitions, and workshops alongside nearby FRC teams, including teams #1700, 254, 971, and 1868. When the neighboring FRC team #6036 was in its rookie stages, we lent them materials and robot building advice to help them grow as a team, implementing our principle of Coopertition. Developing meaningful connections with other teams has allowed us to create an FRC community that will reciprocate our support in times of need.

This year, due to COVID-19 restrictions, we are unable to access our usual lab space, and it is unclear when we will be able to return. Once we do come back, we will ensure we take all the necessary precautions, such as sanitizing all parts of our lab and wearing masks at all times. While many of our subteams can continue operations remotely, drive team practice and build team activities (especially teaching recruits) will be prioritized once our lab re-opens. We will limit the number of students allowed in our lab in order to further minimize exposure risks, and we have allocated a significant portion of our budget to purchase personal protective equipment, masks, and HEPA air filters to ensure the safety of all our members in the lab space.

Student-Run Team

Paly Robotics distinguishes itself from other FRC teams through its student-led structure, meaning all of our operations are planned, reviewed, and executed by the students. This structure instills values such as responsibility, initiative, and diligence in members by allowing them to learn from their mistakes and encounter the consequences and benefits of their actions.

To ensure our team's future success, veteran members are constantly passing down accumulated knowledge to recruits throughout the year. This process is supplemented by a series of mini-classes before Build Season to help recruits gain fundamental knowledge in their respective subteam areas. Veteran members pass down skills in computer-aided design, software, engineering, web design, robot design, and animation. Moreover, they also demonstrate how to effectively conduct outreach, lead projects, and collaborate with others.

In order to support student initiative, all team leadership positions are held by students, as well as tasks such as managing subteams, developing a timeline for the robot, and running outreach programs. Embracing this student-led philosophy gives students the autonomy to make their own decisions and run the team successfully. In fact, 90% of our upperclassmen members report that they gained leadership skills from experiences on Team 8.

Our mentors play a significant role in supporting and nurturing our student-first philosophy, working as enablers of student learning by allowing students to make their own informed choices. Team 8 mentors embrace student mistakes and transform them into learning opportunities to promote student growth and long-term success. By providing guidance and advice, mentors help students navigate the road ahead without restricting them or doing the work for them. As a result, students form, iterate, and implement their own decisions and learn from both their successes and failures. By not fully relying on mentors, it also guarantees that losing a mentor will not significantly hinder our team.

As the team moves forward to embrace new challenges, Paly Robotics' core values of student growth and involvement will remain integral to our team identity.

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Sustainability in Outreach

Giving back to the community and inspiring the next generation of STEAM innovators are fundamental goals for Team 8. Many of our members are currently involved in multiple projects promoting FIRST and STEAM throughout the community. In order to maintain and extend our outreach, we recognize and act upon any risk that threatens our programs.

Paly Robotics strives to maintain long-term relationships with our partners to preserve interest in our outreach projects. Team 8 upholds our side of communication via emails, phone calls, periodic demos, and visits to maintain students' and community members' engagement in our initiatives. At times, it can be challenging to locate when or where assistance from our team is needed especially because of COVID-19 inhibiting our ability to communicate in person. For this reason, we keep an open mind whenever any group contacts us with a request. Moreover, when hosting events, we reach out to those on the summer camp contact list, as we know that those are people who have been previously involved in Paly Robotics outreach and enjoy STEAM learning.

Adapting to the COVID-19 pandemic, our team hosted free educational camps over Zoom to support students and parents during the unprecedented shelter-in-place. We taught a total of 30 camps that ranged in the topics of entrepreneurship, graphic design and animation, and software that reached 130+ students.

Additionally, Team 8 hosts our LEGO Robotics Summer Program, a free camp dedicated to enriching the education of underrepresented students through engaging STEAM learning experiences. The first year we hosted the camp, we partnered with Lauren's House 4 Positive Change, a nonprofit organization for East Palo Alto students, and taught FLL design, build, and programming aspects to 10 students.

Our annual Paly Robotics Summer Camp, established in 2015, served 30 middle school students in its first summer. Over the years, in response to the increased request from our community, we have gradually expanded the camp's capacity — this year we will be offering 190 spots. Additionally, we established 4 separate sessions — Robot Design & Hardware, Entrepreneurship & Web Design, Programming, and Animation & Graphic Design — to cater to campers with various interests. In its 5 years of activity, our camp has taught over 580 middle school students the principles of robot design and fabrication, programming, web design, entrepreneurship, 3D animation, and graphic design through completely student-developed curriculum and immersive, hands-on activities.

Students from Townley Grammar School, an all-girls school based in London, annually visit our lab to get a glimpse at FIRST and STEAM as a co-curricular. To further spread the ideals of FIRST Robotics, we planned on establishing England's fourth FRC team at their school, but unfortunately, contact was lost. Learning from our mistakes, this year, we have re-initiated contact. The committee dedicated to this project has been planning activities for the upcoming visit that are tailored to Townley students' interests and reopened discussion on establishing an FRC team, and over 100 Townley students visited last year.

If Paly Robotics ever found itself not giving back enough to the community, there are steps we can take towards reconstructing our outreach. Collaborative ventures with other FRC teams, such as the international award writing webinar we hosted alongside FRC #1967 and #1868 to help other teams with awards submissions, are activities that could help re-spark our team's outreach. These joint efforts would be a dependable option, as they allow us to continue making a significant impact on our community.

Additionally, some of the most straightforward, yet most impactful operations are robot demonstrations. They require relatively minimal planning and directly demonstrate the capabilities of FIRST robotics, which can be used to garner interest in STEAM among potential participants of future outreach projects.

Outreach will always remain a crucial factor in Team 8 culture, so we can rely on team members to take action to maintain outreach. If one project does not go as planned, there is still a great need for STEAM teaching within our community. Paly Robotics outreach revolves around the idea of serving the community through inspirational methods, meaning that the failure of one outreach project will not setback our other endeavors, nor will it take away from our dedication to outreach.

In all of our outreach activities, the promotion of long-term success is constantly present as an underlying priority. This philosophy is manifested through various actions including offering underclassmen low-stress leadership positions to prepare and excite them for more demanding future commitments and also in the dedication of veteran leaders to guiding newer leads.

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Recruitment and Grade Diversity

Our team recruitment process is designed to ensure sustainability. Every year begins with recruitment season, during which we attract, enroll, and train new members. To start off the recruitment process, we host presentations at student orientation and team information days, which introduce around 600 incoming freshmen to Paly Robotics. Amidst COVID-19 restrictions, our team held virtual info day and night sessions for interested students and their parents, conducted a virtual lab tour, and held 7 recruitment sessions through distance learning.

Leading up to build season, veteran members teach recruits various critical skills, such as creating comprehensive business plans, using CAD software, rendering 3D animations, developing autonomous code, and machining robot parts. This system of passing down knowledge ensures that new members gain the skills and experience necessary to lead the team in coming years. We also maintain a balanced grade diversity, ensuring both current and future success even once our more experienced members graduate. Our team currently consists of 73 members; 20 freshmen, 23 sophomores, 15 juniors, and 15 seniors.

Throughout the year, we host various outreach initiatives, effectively introducing future members to FIRST. These outreach events, which include robot demonstrations and summer programs, help make the team more available to the next generation of STEAM learners. In fact, 50% of our 2019 recruits participated in at least one Paly Robotics outreach event prior to joining the team. This dedication to outreach helps ensure continued interest in STEAM learning and Team 8.