FIRST Impact Award - Team 4131

2023 - Team 4131

Team Number

4131

Team Nickname

Iron Patriots

Team Location

Renton, WA - 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.

In the past 7 years, 4131 has had a 100% graduation rate, striving beyond the 80% WA average. All of our alumni have gone on to attend 4-year universities, many into STEM professions. Our alumni are pursuing PhDs, and working at tech companies like SpaceX, Aurora Flight Sciences, and DroneSeed. Alumni have stayed involved, not only with 4131, but also with mentoring other FIRST teams. Notably, our team's founder is currently a mentor on our team, sustaining an 11 year involvement with 4131.

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

4131 is part of a unique community, being in a well-funded district but part of a low socioeconomic area. To give all kids in our area an opportunity in STEM, every camp we've run has been free. We have brought FIRST directly to public elementary school classrooms through our FLL curriculum which is an easy and cost-free way for teachers to bring FIRST directly to their students, impacting over 270 students by June 2023.

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 spread FIRST's message through implementing 2 weeks of FLL lessons into elementary school learning (2022/23), holding 3 free camps for 80+ kids (2020/21), and engaging our community in STEM at 25+ events between 2021-22, reaching 4000+ people in 2022. We sustain our impact through following our Three Year Plan as well as growing our initiatives with creative additions every year, such as expanding our curriculum with an intermediate level version that will be implemented in 2024.

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

4131 spreads inclusivity through the FIRST community. We have been proponents of Unified Robotics (UR) for five years now. UR, a partnership between FIRST and Special Olympics, gives students with intellectual disabilities robotics opportunities. The Iron Patriots are the UR Ambassadors, spreading the

message and impact of UR throughout WA state. We stepped up to host both the 2021 and 2022 UR Championship and had 20+ 4131 students volunteer for both day-long events.

Describe your team's initiatives to Assist, Mentor, and/or Start other *FIRST* teams with emphasis on activities within the past 3 years.

We've started 86, mentored 38, assisted 28 FLL teams - impacting over 770 students per season. We've also started 8 and mentored 4 FTC teams, started 2 FLL Jr. teams, and assisted 1 UR team. Despite the pandemic's lasting challenges, we have made great progress in revitalizing our FIRST teams, with 15 of the teams we've started competing this year, a number that will only grow as we actively work to incentivize teachers to help us continue the programs in schools across WA state.

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?

We dedicate countless hours to the inspiration of youth. Our 2 week FLL curriculum will have been incorporated in 6 schools by June 2023 - on a path to be in all 16 elementary schools in our district by 2025. The program has engaged students and teachers in FIRST, contributing to more FLL interest. Our Summer of STEM and WOWS/GEARS initiative are ongoing, have already impacted 80+ youth, and are set to impact more this summer. 42% of our underclassmen were on a FLL team started by 4131.

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

We've been partners with UR and Special Olympics Washington for the last four years, serving as the UR Ambassadors, spreading UR to other schools, advertising the program to our community, and hosting the 2021 and 2022 UR Championships. We worked with FRC 2976 and 492 to hold our Summer of STEM program, promoting mutual growth while benefiting our community. We founded the FIRST WA's DEI committee in 2020, and 4131 members work with them as leaders, promoting DEI at PNW FRC events.

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

As the founders of FIRST WA's DEI committee, 4131 members work with other PNW FRC teams to promote equity in FIRST. Half the leadership positions on the committee are filled by 4131 members. Our free virtual camps as well as our WOWS/GEARS initiatives promote equity in our community, creating opportunities for low-income students and gender minorities to thrive in STEM. Through these efforts, we're creating an inclusive and equitable community for future innovators throughout WA state.

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

Our Three Year Plan, outlining our past, present, and future goals, ensures our impact is sustainable; it allows us to focus on key areas to grow in the next year while reflecting on the past year. Our FTC 16942 works to retain underclassmen interest in FIRST while providing them with skills that are developed further in the FRC season. The team has broken world records in scoring, and also massed our team record retention rates: from 22% in 2021 to 82% in 2023.

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

Most of our sponsors are local businesses, creating a culture that engages business owners with their community. Through sponsor gifts and email/video updates, we've cultivated a community of retained sponsors that is invested in the team's success, some supporting us since 2014. Each of our 42 members work to recruit sponsors as a requirement to attend competitions. We also take initiative in applying for grants, receiving thousands from institutions like the Gene Haas Foundation and OSPI.

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

In 2022, 4131 faced challenges in revitalizing our FLL impact. With almost all of these teams breaking up over COVID, we've worked tirelessly to restart them (15 competed in 2022-23). This number is majorly restricted by one factor: declining teacher interest due to online teaching burnout and cuts in budgets/stipends. We've combated this through our FLL curriculum, a free and engaging way to show teachers the value FIRST holds for their students while getting them invested in FIRST programs.

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

Our team's goal is to forge young leaders in STEM, no matter their background. To accomplish this, we've created 96 FIRST teams, and a comprehensive robotics curriculum providing students with the resources needed to kickstart their STEM future. We've spread the message of FIRST to over 47,000 people, accumulating over 4,000 hours of educating, inspiring, and impacting our community for the better. All kids deserve the FIRST experience, and we continuously fulfill that desire.

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.

4131 is always aimed at the future, ensuring measurable growth among youths involved in STEM. In the next 5 years, we look forward to ensuring that all elementary schools in our district have at least 4 FLL teams, which would impact over 500 students. We are working to have our curriculums incorporated in 16 schools, potentially reaching over 2500 students. We're working to eclipse our pre-COVID levels of community impact by 2025.

Essay

The Iron Patriots are doing more than building robots - we're forging a community through STEM. Through our multitude of FIRST programs, emphasis on inclusion, and extensive outreach efforts, we have made an unprecedented and continual impact on our community.

FLL The Iron Patriots have a sustained dedication to starting and maintaining FLL teams; we have started 86 FLL teams across 20 schools. We have directly mentored 38 teams and assisted another 28, and we coordinated the mentorship of the remaining teams by partnering with other local FRC teams. During the pandemic, we furthered these connections, working with FRC 2976 and 492 to teach a comprehensive 3 month long virtual FLL camp that we developed to sustain our FLL impact amidst COVID restrictions. Despite not being in-person, our efforts continued to be successful with over 60 signups from grades 2-7.

FLL Curriculum Coming back from COVID, our team has been working to revitalize our FLL efforts. In doing so we faced many challenges, as after the pandemic, many schools decreased budgets for STEM programs, lowered wages for teachers, and cut stipends for after-school advisors. The Iron Patriots recognized the hardships teachers were going through and, in response, developed our Intro to Robotics curriculum: two weeks worth of FLL lessons to be taught in 4th and 5th grade classrooms, giving students a complete introduction to FIRST. By having this as an integral part of the elementary curriculum instead of a specialized after-school program, we are ensuring that a large and diverse range of students are able to be exposed to FIRST and STEM learning. In May 2022, we tested our lessons in 3 classrooms, impacting 50 elementary school students. With feedback from our test run, we have refined the curriculum and are bringing the lessons into 9 classrooms over 5 schools during the 2022-23 school year, giving 225 students exposure to the incredible aspects of FIRST programs. Looking forward, we are expanding this project by creating an intermediate level curriculum, incorporating official FLL challenges into 5th grade learning and allowing students to expand on the knowledge they obtain in 4th grade from our original curriculum. This will ensure the program sustains itself as students progress through elementary school. Based on the incredible interest we've seen in the program this year, we are already working to have our curriculum incorporated into all 16 of the elementary schools in our district by 2025.

Other FIRST Endeavors Over the past six years, we have directly impacted over 100 FIRST teams. While FLL teams are our most popular programs, we've also started 8 FTC teams and mentored an additional 4, along with starting 2 FLL Jr. teams. Through our efforts to spread FIRST programs throughout our community, we have seen a trickle up effect as students who participated in our FLL programs as elementary schoolers retained that interest in FIRST and later joined our FRC team as high schoolers, with 42% of our underclassmen having previously been on an FLL team started by 4131. Looking forward, we plan to revitalize more FIRST teams in our community by providing them with essential educational resources to ease them in the process of starting back up.

Unified Robotics The Iron Patriots believe that all students should be able to experience the joy of robotics, regardless of their ability level. With that in mind, we created our school's first Unified Robotics (UR) teams, operating under Special Olympics and FIRST, to provide STEM opportunities to students with intellectual disabilities. Our Unified teams don't just benefit the athletes participating—they exist to benefit both the athletes and partners alike. This year, we had three UR teams, marking our fifth and most successful year thus far. The Iron Patriots have hosted and supported the Unified Robotics Championship for the last two seasons, giving 54 UR teams an event to show off their hard work and celebrate inclusivity in STEM. We are the proud recipients of three FIRST Foster Awards, an award which celebrates the efforts to make inclusion a cultural norm in the community. 2023 marks the fourth year that the Iron Patriots have been the official Unified Robotics Ambassadors, through which we've spread UR to other FRC teams and emphasized the importance of inclusion. In 2022, we advertised UR

to over 90 FRC teams across the PNW and held an informational meeting for those interested in starting UR at their school. Through this, we were able to assist Skyline High School in starting UR, spreading inclusion across our school district. We are holding another meeting this spring to continue spreading inclusivity further than our local community.

Community Impacts Year-round, we've impacted people at many locations, from libraries to festivals, educating our community about FIRST. Our team has been bouncing back from the pandemic, adding to our impact tremendously: attending 26 events and accumulating 89 hours of active community involvement between 2021-22. We've reached over 4,096 people in 2022 alone, making a total of more than 47,496 people impacted over 124 events between 2017-2022. As more events return, we see ourselves exceeding our pre-pandemic levels of community involvement in the next two years. Our progress since the pandemic has been astronomical as we work to revitalize our community impact; we have never let COVID-19's lasting challenges stop us, constantly finding new ways to inspire. After safety restrictions reduced our ability to spread FIRST's message in-person, we had a chance to be creative with our outreach. During the summer of 2020, we developed and ran a two-week long virtual STEM summer camp which we amped up in 2021, running three separate camps to educate a wider population. By making these camps free, we exposed 60+ students to STEM regardless of their socioeconomic status. The summer of 2023 is bringing with it a switch to 3 weeks of in-person camps through a partnership with the City of Issaquah, in which we will continue to provide youth in our community with essential FIRST education.

Gender Minorities in STEM In 2020, we hosted our first ever Wonders of Women in STEM (WOWS) Workshop, where we educated attendees on different aspects of robotics. To expand upon this, we ran a WOWS Spring Break Camp in 2021, holding daily Zoom lessons for over 20 students, a camp we held again in 2021 as a part of our Summer of STEM program. 4131 members taught attendees about CAD, coding, careers in STEM, and more. To include other marginalized identities, the Iron Patriots relaunched WOWS as our Gender Equity in Automation, Robotics, and STEM (GEARS) initiative in 2022. Through this, we strive to provide a safe space for young non-binary and transgender innovators along with young women. We are actively partnering with the King County Library System to hold free GEARS workshops every other month, beginning this April, providing all youth a space to explore, learn, and be at the forefront of STEM, regardless of their gender identity.

DE&I Diversity, Equity, and Inclusion are ideals that we hold in high regard. The Iron Patriots are the founding members of FIRST Washington's DEI committee, working with students across the state to further inclusivity in STEM. Through our extensive work with UR, free online camps, and STEM programs for gender minorities, our team provides opportunities for everyone to participate in robotics, no matter their ability level, gender, socioeconomic status, or ethnicity, promoting equity throughout our community. Three Year Plan To ensure our impacts are lasting, we created our Three Year Plan in 2016, which outlines our past, present, and future goals. The plan is updated at the end of each year after we reflect on which goals were met and which to focus on the next year. By providing information to interested schools about starting UR and assisting FRC 2976 in doing so, we have fulfilled our goal of spreading UR to other schools as well as our goal of helping other FRC teams expand their impact. Additional goals accomplished include revitalizing FLL programs, which we were able to do by restarting FLL teams as well as by developing and spreading our FLL curriculum. Looking forward, our goals for the 2023-24 season include spreading our FLL curriculum to more elementary schools in our district, growing our GEARS initiative, and creating and distributing technical resources to developing FRC teams.

Our Team The culture of helping others doesn’t stop when we get back to our home base, Liberty High School. A successful and sustainable team requires a reliable plan of inducting rookies and molding them into seasoned team members. Our world-record-setting, competition-winning FTC team—16942, The Minutemen, hooks underclassmen into FIRST as soon as school starts, and gives freshmen an easier way to ease into FRC, resulting in higher retention rates: from 22% in 2021 to 82% in 2023. From our rookie year in 2012, we have grown from 10 students to 42, and from 2 mentors to 12. FRC 4131 is truly a life-changing experience: members stay connected long after graduation and many have come back as FRC mentors. Most of our alumni have gone on to attend a four-year university, with the majority going into STEM-related fields of study.

Forging the Future For the past eleven years, we have grown not only in number but in our vision to further our impact. From the very first FLL teams we started to our work with Unified Robotics, we will always focus on how we can truly serve our community. Our impacts encapsulate the ideals of FIRST, especially through “measurable impact with emphasis on promoting science and technology through FIRST programs”. The Iron Patriots will continue to work tirelessly to forge STEM and FIRST opportunities for all, creating an everlasting impact on those around us. ;