

***FIRST* Impact Award - Team 4131**

2024 - Team 4131
Team Number
4131
Team Nickname
Iron Patriots
Team Location
Renton, WA - USA
Describe the impact of the <i>FIRST</i> 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 <i>FIRST</i> programs as mentors/sponsors.
For the past 8 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. Our team celebrates diversity: 38% non-male; our leadership team is 56%.
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. We have brought FIRST directly to public elementary school classrooms through our FLL curriculum which is a cost-free way for teachers to engage students in FIRST, impacting over 400 students by June 2024. We disseminate and support FIRST teams throughout our district, with an emphasis on our high school's feeders: 4 elementary (17 FLL) and 2 middle schools (3 FLL, 2 FTC).
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?
To spread FIRST's message: implemented FLL lessons into daily elementary school learning (2022-24), held a STEM summer camp for 90 kids (2023), and engaged our community in STEM at 53 events, reaching 113K people (2021-23). We sustain our impact through following our 3 Year Plan as well as growing our initiatives, such as expanding our curriculum for 2nd grade and the SPIKE Prime. Results are measured through the growth of long-standing initiatives (ex. UR - 6 years).
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 six years now. UR, a partnership between FIRST and Special Olympics, gives students with intellectual disabilities robotics opportunities. 4131 are the UR Ambassadors, spreading the message

and impact of UR locally, nationally, and globally. We hosted the UR Championship for the past 3 seasons and had 20+ 4131 students volunteer at each day-long event.

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

In the last two years, we both started 8 FIRST teams and revitalized 44 that had been on hiatus due to pandemic-related factors (lack of staff advisors due to lower stipends and teacher burnout). We mentored 19 FLL and 5 FTC; we've assisted 41 FLL and 11 FTC.

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 has been incorporated in 6 schools - on a path to be in all 16 elementary schools in our district by 2026. The program has engaged students and teachers in FIRST, contributing to more FLL interest. Our Summer of STEM and GEARS initiative are ongoing, have already impacted 137 youth, and will impact more this summer. Results: FIRST starting/mentoring in feeder schools contributing to trickle-up into our team.

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

Been partners with UR and Special Olympics Washington for 5 years, serving as the UR Ambassadors, spreading UR globally and hosting 3 UR Championships. We founded FIRST WA's DEI committee (2020); 4131 members are leaders, promoting DEI at PNW FRC events. Attend various community events with FIRST WA: JBLM, Annual Community BBQ, Seattle Pride. Founding members of the Issaquah Robotics Alliance: allows for shared support and advice on various FIRST affairs, particularly mentoring in the ISD.

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. 50% of leadership positions on the committee are filled by 4131 members. Our free WOVES/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 and 24621 work 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 updates, we've cultivated a community of retained sponsors who are invested in the team's success, some supporting since 2014. Each of our 38 members work to recruit sponsors as a requirement to compete. We take initiative in applying for grants, receiving thousands from Boeing, OSPI, and more. Summer of STEM also is a fundraiser: 15K net profit in 2023

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

We had a lot of technical leaders graduate in 2023, resulting in our team losing a lot of knowledge due to an inadequate focus on training. In order to improve this for future years, we are developing subteam lead handbooks that detail everything team members need to know about being in leadership positions on the team, including key technical resources. We have also emphasized older subteam leads partnering with younger members to make sure that FRC knowledge is passed on effectively.

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 been involved in 50+ FIRST teams, and created a comprehensive robotics curriculum providing teachers with the resources needed to kickstart STEM futures. We've spread the message of FIRST to over 113K people in the last 3 years (local events such as elementary STEM fairs, Boeing Family Days, Seattle Pride, etc) educating and inspiring our community for the better.

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 4 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 are a team that constantly builds on the work of the year prior; we've been developing our outreach since 2017.

Judge Feedback

Who/When

Feedback

Apr 05,
2024
07:17:14
PM EST

The Jolly Roger (TJR) stuck on high seas during 60min storm. H2O sloshing in at 1.1^t ft^3/min. 10min in, crew starts emptying TJR w/ buckets (3/t+2)+t ft^3/min. Find total amt. H2O sloshed in during storm and time when rate H2O in = rate H2O out.

An area the team has an opportunity to improve.

Something that really impressed the judges.

Essay

The Iron Patriots (IP) do more than build robots - for the past 7 years, we've forged 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 Curriculum Coming back from COVID, we discovered numerous barriers preventing Issaquah School District (ISD) FLL teams from running: many schools decreased budgets for STEM programs, lowered wages for teachers, and cut stipends for after-school advisors after the pandemic. The IP recognized the hardships teachers were going through; in response, we developed our Intro to Robotics curriculum: two weeks worth of FLL lessons designed for 4th and 5th grade classrooms, giving students a complete introduction to FIRST. We're committed to supporting the growth of this curriculum; this year, we expanded it by creating a version for 2nd grade and updating the lessons for use with LEGO's new SPIKE Prime. By introducing this as an integral part of the school day instead of a specialized after-school program, we ensured that a large and diverse range of students have access to FIRST and STEM learning. Between May 2022 (our test run in Apollo Elementary's gifted classrooms) and February 2024, we've brought these lessons into 13 classrooms over 6 schools, impacting 292 elementary school students. By the end of the 2024 school year, these numbers will have grown to 17 classrooms and 410 students. Based on the incredible interest we've seen in the program,, we are continuing to work towards our goal of having our curriculum incorporated into all 16 of the elementary schools in our district by 2026.

FLL The FLL Curriculum accomplished one of its major purposes of engaging teachers with FIRST: of the 7 teachers who ran the lessons in 2022-23, 3 became staff advisors for FLL the following school year. The IP have a sustained dedication to starting and maintaining FLL teams. We take staff advisors through the entire experience of running a FIRST team, ameliorating their experience and making sure they are adequately supported. We first approach school principals and interested staff advisors with the proposal of starting FIRST teams at their school, making them aware of FIRST programs. We then work through administrative aspects of starting teams, such as acquiring funds and going through the FIRST registration process. In situations where we can commit to regular mentorship, we assign each team with 2 high school mentors and provide them with weekly support as they work towards their winter competitions. In the two last years we started 8 new FIRST teams (5 FLL, 3 FTC) and restarted 44 FIRST teams that had been halted due to COVID (36 FLL, 8 FTC). We have directly mentored 24 teams (19 FLL, 5 FTC), and we coordinated the mentorship of the remaining teams by partnering with local FRC teams (2976, 1318, 9032) through the Issaquah Robotics Alliance. Including teams started and mentored, we have assisted 52 teams (41 FLL, 11 FTC).

Unified Robotics The IP 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 (ID). 2023 was our sixth year in UR; we had 2 teams and 7 participants. In UR, students with ID (athletes) partner with students without ID (partners) to build and program LEGO robots, culminating in the UR Championship. The IP have hosted and supported the PNW UR Championship for the last three seasons, giving 89 teams an event to show off their hard work and celebrate inclusivity in STEM. This season the UR Championship hosted 11 schools, 35 teams, 122 competitors, and more than 500 spectators and volunteers. We are the proud recipients of four FIRST Foster Awards, an award which celebrates the efforts to make inclusion a cultural norm in the community. 2024 marks the fifth year that the IP have been the official Unified Robotics Ambassadors, through which we've spread UR to other FRC teams and emphasized the importance of inclusion. For the last two years, we have held virtual informational meetings for schools interested in starting UR in their region. Our 2023 meeting had over 30 attendees from the United States, Canada, and Australia. This meeting had the added impact of achieving one of our team's biggest goals since becoming ambassadors: spreading UR further outside of

the PNW region (where it was founded and is currently concentrated). Through our meeting, we facilitated the expansion of Unified nationally (to Oregon and Minnesota) and globally (to Wollongong, Australia). We will continue spreading the message of UR for years to come with the hope that someday UR will have a spot at the FIRST World Championship.

Community Impacts Year-round, we've impacted people at many locations, educating our community about FIRST. Over the last three years, our team has reached around 113,000 people at 53 outreach events. In 2023 alone, we reached 109,000 people across 27 events, amassing a collective 509 hours of active community involvement over 76 hours of event time. The summer of 2023 brought with it a new addition to our impact: our now-annual summer camp, Summer of STEM. Spanning one week, we offered 5 camps with 2 sessions each (AM/PM) to 90 K-8 students; topics included FLL robotics, 3D printing, and Scratch. We are growing our reach next summer by expanding to 2 weeks of camp, projected to reach 368 students.

Gender Minorities in STEM In 2020, we hosted our first ever Wonders of Women in STEM (WOWS) Workshop, where we educated middle school 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. IP members taught attendees about CAD, coding, careers in STEM, and more. Our commitment to ensuring the inclusion of all gender identities required a rebranding of WOWS. The IP 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. In 2023 we partnered with the King County Library System to hold 6 free monthly GEARS workshops at 2 local libraries, teaching 47 students LEGO robotics, Scratch, and Java and providing all youth a space to explore, learn, and be at the forefront of STEM.

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. The DEI committee brings together students and FIRST Washington staff to discuss and implement positive change at district events. Through our extensive work with UR and free STEM programs for gender minorities, our team provides opportunities for everyone to participate in robotics, no matter their ability level, gender, or socioeconomic status. Three Year Plan To ensure our impacts are lasting, we created our Three Year Plan in 2016, outlining 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. We have already successfully accomplished 2 of our 3 goals for the 2023-24 season: spreading our FLL curriculum and expanding our GEARS initiative. Our third goal, creating and distributing technical resources to developing FRC teams, is being actively pursued, with our subteam heads creating detailed guides outlining their technical and administrative advice based on what they learn throughout the season. Looking forward, our goals for the 2024-25 season include implementing our curriculum into 4 more schools in our district, bringing UR to 3 new regions, and improving team sustainability through subteam lead handbooks.

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 recruiting 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. To provide for a large surge in interested underclassmen, we formed another Liberty FTC team this season:

24621 – Total Chaos. From our rookie year in 2012, we have grown from 10 students to 38, 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 twelve years, we have grown both in number and 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.

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