FIRST Impact Award - Team 125

2025 - Team 125

Team Number

125

Team Nickname

NUTRONs

Team Location

Revere, MA - USA

Describe the impact of the *FIRST* program on team participants within the last 3 years. Think about percentages of those graduating high school, attending college, in STEM careers, leadership skills, and serving as mentors/sponsors in *FIRST* programs.

The NUTRONs have shown resilience and a love for problem-solving. Our district's graduation rate is 82% with only 45% of them attending higher education. In comparison, 100% of our students have graduated and pursued higher education in the last 3 years, with 96% of them pursuing STEM careers. Currently, all of our mentors are FIRST alumni, with 58% of them being NUTRONs alumni. Additionally, 15 current students mentored our 5 FLL teams, demonstrating a passion for giving back within our team.

Describe your community along with its unique opportunities and circumstances. Think about your geographic region, diversity of town/school, language barriers, socioeconomic barriers, and cultural expectations.

The NUTRONs consist of students from 5 schools joined under Greater Boston Robotics. We're based in Revere, a diverse community that is 65% low-income, 80% high-need, and 72% ESL students. As an accurate representation of our community, we are 88% minority, and 33% of us speak English as a second language. With 16 languages spoken, the NUTRONs break language and cultural-based barriers, allowing us to collaborate with teams worldwide and provide a welcoming space to all.

Describe the team's methods, with emphasis on the past 3 years, for spreading the *FIRST* Mission in ways that are effective, scalable, sustainable, and creative.

Our team embodies FIRST's mission both locally and globally. We are working with NE FIRST to engage students with disabilities, guide them in building FLL robots, and showcase their work at NE DCMP. Internationally, NUTRON students mentor middle school girls and staff in Cambodia in FLL Robotics through weekly Zoom calls. To supplement their learning, we provided a curriculum in Khmer. As always, we'll continue to build confidence and skills in students who never saw robotics as a possibility.

Describe your team's goals and the progress you have made towards them to fulfill *FIRST's* Vision.

Our goal is to provide affordable and accessible STEM to all. Summer Bridge is a free program for incoming RHS freshmen, where NUTRONs lead a mandatory robotics class, introducing them to robotics and STEM. Starting in 2017, we created a robotics elective focused on developing problem-solving skills

through FIRST-based curriculum. Additionally, our FLL-based programs, like our FTC program, have always been free to all in our district, making robotics accessible and affordable.

What impact has your team seen from your efforts described in the above question? How does your team measure impact?

We measure impact by the number of people we can expose to robotics through our programs, initiatives, and events. Because of our FTC and FLL programs, 100% of FTC students have joined us for FRC, and we're able to mentor 30 youth annually through FLL. Summer Bridge has allowed us to reach 400+ RHS students since its start in 2021, and through our robotics elective, we've reached 200+ students, which when combined with our demos, results in 1000+ students learning about FIRST every year.

Please provide specific examples of how your team and team members act as role models within the *FIRST* community with emphasis on the past 3 years. How do you share these best practices with other teams?

The NUTRONs host all levels of FIRST and run FLL and FRC events. To support other teams, we host an annual kickoff and quick build. We founded resources like The Compass Alliance and initiatives like Hear For You for the FIRST community. We've also started two Unified Robotics teams in MA. With our achievements off-field, we consistently perform on-field, reaching world champs yearly since 2012. Everything we do demonstrates selflessness, efficiency, and leadership for others to emulate.

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

Our team is proactive in assisting other FIRST teams. We host a yearly quick build, in which rookie teams come to our space and we help them assemble and program their kit bot. Additionally, we've hosted practice sessions: four weekends in which 4 teams sign up and utilize our full practice field. Our mentors and veteran students also work personally in mentoring nearby teams, alongside our veteran students who fully mentor and coach our 7 FTC and 5 FLL teams.

What other initiatives have you created, grown, sustained, or participated in (*FIRST* or otherwise) to help inspire young people to be science and technology leaders and innovators? What outcomes have you seen from your efforts in the past 3 years?

Every year, the NUTRONs hold demos of our FRC and FTC robots at 5 elementary schools in Revere. We communicate with Happy Chandara School in Cambodia weekly, aiding them in running their program which has taught 120 girls in the past 2 years. We offer a mandatory robotics class with a student-made curriculum in our summer bridge program, required for 100 incoming freshmen each year. This empowers them to try STEM and develop an interest in it, pushing them to pursue STEM through school.

Describe the partnerships and relationships that you've created with other organizations (teams, sponsors, educational institutions, government, philanthropic entities, etc.) and what you have accomplished together, with emphasis on the past 3 years.

We collaborate with NE FIRST to run FLL and FRC events yearly. Additional collaboration with FIRST brought quiet rooms to FRC events. By connecting NE Unified Robotics programs we laid the foundation for a Unified league next year and exposition at 2 FRC events this year. Our long-term partner PTC provides us with enterprise Onshape accounts and 12 laptops for team and class use. Finally, our

relationships with Amazon, Molex, Medtronic, and RPS have covered competition fees and team operations.

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

The NUTRONs are a linguistically diverse team who share our space, tools, and financial resources aiding students in need and lowering barriers to entry to FIRST within Greater Boston. Our robotics classes, which have evolved from FTC based curriculum to our platform due to increasing popularity, expand STEM access to students who are unable to attend meetings. We also expand robotics to neurodiverse students through Unified Robotics, working together to build a competition-ready FLL robot.

Explain how you ensure your team and the initiatives you have created will be sustainable.

The NUTRONs have built a sustainable pipeline of students in Greater Boston. Middle school students start in FLL, where they find a passion for robotics and eventually join FTC and FRC. As students progress through our pipeline, our seniors and NUTRONs alumni transition knowledge and leadership of initiatives to them. Our pipeline has ensured the sustainability of Quick Build and Hear For You, and the creation of new initiatives like our Unified robotics program.

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

The NUTRONs aim to provide a more welcoming environment for women in Greater Boston. Our team went from 5% to 18% women in the last year and strives to increase this number in the following years. We've created a program that assigns an experienced NUTRON to each new female student creating a more welcoming and equal environment. We also aim to promote women in STEM, beyond our community, by bringing FLL kits and curriculum to 60 new girls a year at an all-girls school in Cambodia.

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, particularly noteworthy, or had a large impact.

Our team has a long history of innovating solutions in our communities; from being a founding TCA team to creating Hear For You, and starting Unified Robotics in Greater Boston. Additionally, we brought FRC district events to Boston, and FIRST robotics to Cambodia, a country with no previous FIRST programs. As we have gained recognition from our district, we have used our influence to uplift our students, creating meaningful curricula, and even donating our new practice space to another program.

Judge Feedback

	What would be the best decision our team could make to grow and impact our community? In other words, are there opportunities you see that we might have overlooked? **An area the team has an opportunity to improve.** **Something that really impressed the judges.**

Essay

Like neutrons at the core of an atom, the NUTRONs are the binding force that brings our community together. We lead by example locally, uplift communities globally, and sustain our impact through a cycle of students who carry our mission forward. Just as neutrons enable stability and growth in the atomic world, we strive to create stability and opportunity in STEM for all, breaking barriers to ensure inclusivity is at the heart of everything we do. From mental health initiatives like Hear For You to expanding STEM access worldwide through our FLL-based program in Cambodia, we spark connections, inspire innovation, and build a better future—one NUTRON at a time.

LEADERSHIP Whether by inspiring our communities, innovating solutions, or assisting other teams, we aim to lead by example and make lasting change everywhere we go. We've demonstrated leadership through collaborating with FIRST to create long-lasting and impactful initiatives within our community. In 2018, a group of NUTRON's students recognized FIRST's lack of mental health support. We created Hear For You (HFY) and began working with The Compass Alliance (TCA) to implement it. HFY is a platform that serves as a way for students, mentors, and volunteers to support each other in building a culture of empathy. Creating HFY brought the implementation of Quiet Rooms (QRs) at all FRC competitions globally, providing an oasis for students who need a break from the chaos of FRC competitions. Recently, we've worked towards providing these resources for FTC and FLL, as no matter the age, participants can still experience the same anxiety and stress. This year, we've brought the first QR to the FTC MA State Championship, with plans to continue expanding and making a lasting impact on all of FIRST.

We host multiple events, setting an example for the rest of the FIRST community and encouraging teams to assist each other. Having hosted Kickoff for 17 years, we've been the center for over 30 teams in the area to pick up their kit of parts and experience a day of excitement and strategy. Many of our events occur yearly, such as the Greater Boston District Event and an FLL Qualifier. Our team gains leadership experience by hosting these events and students on our team volunteer to help with these initiatives. Hosting is a way that we encourage other teams to run events and set an example of what FIRST events should be like, often advising teams seeking to host.

The NUTRONs have always found ways to uplift teams around us and level the playing field. In 2024 we started our practice sessions, providing our full-sized practice field for 4 different teams on 4 weekends. While we don't have the full practice field anymore, we will still host 2 teams on each of the 4 weekends. By doing what we can to help teams around us, we promote Coopertition and hope to inspire others to do what they can with what they have, exemplifying leadership in Greater Boston.

In the summer of 2023, we expanded our message of affordable and accessible STEM opportunities on a global scale. Focusing on bringing STEM opportunities to Cambodia, we partnered with NGO Toutes à l'école to go to Happy Chandara School, providing FLL kits to an all-girls school for students with household incomes of under $150. We've grown our relationship with the school through weekly virtual meetings. Providing the schools with LEGO kits and support has impacted 120 students so far, and we've planted the seeds to continue working with other NGOs in the Phnom Penh area to provide more opportunities to those less fortunate. By bringing FIRST to Cambodia and sustaining it, we encourage other teams to spread the mission of FIRST overseas, demonstrating our leadership globally and willingness to expand our initiatives.

SUSTAINABILITY Historically, the NUTRONs have created initiatives for facilitating sustainability such as TCA, a platform for teams to learn how to keep their team afloat. TCA was the first initiative to do so,

setting a precedent for initiatives that sustain our fellow teams worldwide.

Leveraging our leadership to promote sustainability locally, the NUTRONs host a Quick Build (QB) event, in which teams may come to our shop so that our mentors and students can help them build the kitbot. Since starting QB in 2008, we've helped 96 teams assemble and program their kitbots in a weekend. QB assists young teams in making significant progress early in the season and learning technical skills that will continue to empower them for future seasons.

We stay sustainable by recruiting from all of our programs - building a cycle that keeps a consistent number of students on our team. At the youngest level, elementary students become interested in engineering or FIRST through the demos we hold at our elementary schools. Once they reach middle school, they join one of our FLL teams and begin developing robotics skills. In high school, they join one of our 7 FTC teams, which we use as a stepping stone to more complex robotics. Once the FRC season begins, the students will be ready to join in building a comp-ready robot. After a NUTRON graduates, they often come back to mentor new students and lead the initiatives they worked on as students. Due to our efforts to cycle our students through our family of programs, the NUTRONs have continued to succeed, and remain a model for sustainability amongst FIRST Teams.

With Revere being a low-income community, we understand the importance of accessibility in programs. Our team's sustainability and inclusivity go hand in hand, as our numerous free programs allow anyone in Greater Boston to participate in FIRST while keeping our team alive and our initiatives running.

INCLUSIVITY We've always focused on making STEM and its opportunities accessible to all. All of our programs are free, with aid offered for travel costs. This allows all of our students, no matter their financial circumstances, to have the same opportunities.

We strive to bring the joy of FIRST robotics to all, focusing on often-overlooked students. This year, we've started one of the first Unified Robotics districts in Massachusetts (MA). We've created two teams of 10+ neurodiverse students in our high school, who build FLL robots to compete in a previous year's game. We've collaborated with other New England (NE) teams to take this year as a pilot year, with each team running Unified Robotics their way and a plan to demonstrate their approaches at NEDCMP. Using the teams' data, we'll create guidelines for next year's season. We're focused on working with the Life Skills population within Revere High School (RHS), who usually would not have the chance to work with robotics. Unified levels the playing field for all students, regardless of physical or learning abilities, so they may come together to build a robot, learn about the engineering process, and have fun. By introducing FIRST to neurodiverse students locally, the NUTRONs aim to include all students in building a better world.

Throughout our history, we have always been a team with students from different backgrounds. Our team prides itself in our linguistic diversity, speaking 16 languages, from Spanish to Khmer and Arabic. With so many languages spoken on our team, we create a welcoming environment for all people. With different languages spoken on the team, we break cultural and language barriers, collaborate with teams worldwide, and spread FIRST's mission within our community and the world.

The NUTRONs bring robotics to all students, even those not on our team. Starting in 2017, we've run a robotics elective at RHS, using a FIRST-based curriculum to develop problem-solving skills. Since its inception, we've reached over 200 students, expanding access to robotics and FIRST's values to

students unable to join our programs.

COMMUNITY Revere, MA is one of NE's most culturally diverse cities, consisting of 65% low-income, 72% ESL, and 80% high-need students. As an accurate representation of our community, we are 88% minority, and 33% of us speak English as a second language. In support of our community, we offer many programs suited to low-income families like our FLL and FTC teams.

The NUTRONs are always looking to invest in their community, like our Summer Bridge program. This class is free to all 8th graders, promoting access to free STEM education. Students mentor these youth on the engineering process and lead a project with FIRST foundations. As we teach, we also recruit for our FTC teams. Every year, our team hosts a free FTC program available to all students in Greater Boston. Each team has 7-8 people and is completely student-led. We aim to inspire the minds of youth and create an environment where they can learn about STEM for free. Our team fosters community by uplifting high schoolers with leadership opportunities and creating a pipeline of NUTRONs.

125 has always found passion within Greater Boston, providing opportunities for middle schoolers to get involved with FIRST. Every fall, the NUTRONs recruit middle schoolers through our free FLL program at RHS. Our students mentor 4 teams, guiding them through building a LEGO robot and strategy. Our mentors grow connections with these students as they provide help and a safe place for them. They learn cooperation by working side by side to build a robot. By the competition, we hope to have sparked a passion for the engineering process and FIRST. We provide a free innovative experience to the youth in our community, hoping they embody what it means to be an engineer and FIRST with them into their future.

The NUTRONs are more than a robotics team—we are a force for change, a catalyst for growth, and a beacon of inclusivity in STEM. Like neutrons at the core of an atom, we bind our community together, creating stability and opportunity for all. Through initiatives like Hear For You, Unified Robotics, and our global outreach in Cambodia, we demonstrate leadership that inspires others to act.;