

FIRST Impact Award - Team 316

2023 - Team 316
Team Number
316
Team Nickname
LUNATECS
Team Location
Carneys Point, NJ - 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.
Since '20, our 11 graduates all attended STEM post-secondary education and 1 became an EMT. We attribute this success to the partnership we have with Salem Community College (SCC). SCC provides our students with 18 free college credits over a 2 yr period. Having these credits listed on college applications is a huge bonus while also helping to offset college expenses. This year, we have 13 mentors, of which 53.3% are FIRST alumni, and 85% have STEM degrees or are working in a STEM field.
Describe your community along with how your team addresses its unique opportunities and circumstances.
Our shop is located in Salem County, NJ. This area has a minority population of 79%, and where free and reduced lunch rate eligibility is 71%. We are a community-based team, thus fundraising is a top priority. We focus on seeking partnerships with local schools, creating fundraising events, and we seek grants. Our partnership with SJR helps to provide financial assistance to our members when needed. To give back, we attend many outreach events to engage new people and to seek sponsorships.
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?
The Robot Run & STEAMFest is the largest robotics event in South Jersey that shows students a STEM path (start with FIRST > go to college > get a STEM job). We host a 5K and 1 mile walk to encourage sponsors to attend and financially support FIRST. In '21 we added a College Row to provide information booths; it has now grown to 8 colleges in '22! We had an exciting 173 runners in '22 (50% increase from '20)! Over the last 3 years, we estimate our outreach to the community to be 1000+ people.
Please provide specific examples of how your team members act as role models within the FIRST community with emphasis on the past 3 years.
As role models, we like to inspire peers/younger kids at outreach events, showing them FIRST opportunities: Kingsway HS demo '22 for 35 people; Clearview HS demo '22 for 150 people; Penns

Grove MS demo '21 for 400 people; Trinity Church Camp '22 for 35 people; Penns Grove STEM intensive '20-'22 for 1315 people. We facilitate several competitions and ensure others act with gracious professionalism: FRC Duel on the Delaware for 350+ people; Explore Festival and Challenge Qualifier for 350+ people.

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

We love starting new teams! In '21 we started a school Challenge and FTC team. In '22 we started 3 community FLL teams who met at SCC with us (2 Explore and 1 Challenge team). Every Sept-Dec, we conduct FastTrack sessions for our SJR Challenge teams to provide mentoring advice on coding. We also give feedback on their project concept, prototypes ideas, and provide assistance finding guest speakers. In fact, our mentor Eric, is a solar engineer, and was asked to be a guest speaker in '23.

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 support a federal college-readiness program with SCC, called GEAR-UP by creating and teaching STEM courses for 7-12 graders. We facilitate Spring and Fall monthly Sat. sessions and a 6 wk summer program. This continues to grow each year ('20=5 students, '21=45 students, '22=90 students). We also inspire students via summer camps (RoboQuest '22=8 campers, STEM Quest '21 & '22 =49 campers, Little Sparks '22 =40 campers). Our feedback surveys showed that ½ the attendees wanted to join FIRST.

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

In '21 we worked with Renaissance Village to host a STEM camp which started a Challenge team; and helped Penns Grove Middle School create a Challenge and FTC team. In '22 our mentors initiated talks with Atlantic City, Camden (started Challenge team in Fall '22), and Cumberland schools to create more teams for the '23 season. Our most valuable partnership is with SCC, a gracious host dedicating a space for our robotics lab, the use of classrooms, and their theater and gym areas for events.

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

We believe in supporting women's health to improve gender equalities by opening up the dialogue on period awareness care and breaking down social stigmas. In '22 we reached out to Team 1868 who launched the M.E. program (Menstrual Equity ambassadors who provide free period products at events). We are proud to have provided these products at 4 FIRST events over the last year. We've learned that 1 in 5 women can't afford products and we are seeking more opportunities to break down that inequity.

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

We started in '99, and in '08 we incorporated a nonprofit called SJR, to help create more team levels in FIRST. Our team helps SJR by providing technical and mentoring guidance to those other teams with coaching, hosting FastTrack sessions, and facilitating the Qualifiers. Working with SJR teams, we

develop and encourage growth for younger students. We hope many will join Team 316 in the future to maintain our sustainability. We added 2 Explore, 2 Challenge, and 1 FTC team in the last 3 years.

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

We love our annual Robot Run to prominently display sponsor names at the race, and ensure they are recognized with social media shout outs. In addition, we invite our sponsors to set up exhibits/information booths at our Duel on the Delaware as well as the FLL Qualifier we host. These events help us encourage additional engagement. For example, a Lockheed rep is interested in joining SJR, and a Wedgewood Pharmacy rep is interested in mentoring Team 316 after they both judged the FLL Qualifier.

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

As we embark on our 25th year, we've realized that our connection with alumni could be enhanced. To reconnect, one of our mentors has been leading our students to create an alumni network. We've had some success. For example, a '20 alumni provided post-match recaps at the Duel on the Delaware this year. Also, we had a '16 alumni return this year as an electrical mentor and a '19 female alumni return last year as our social media mentor. 66% of our '22 alumni continue to provide technical help.

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

We sought a need in our community with Project Propel (custom Swim Fin). We made a mold which forms a fin into an adaptive device. This is used by veteran amputees wounded in battle and spinal cord injury victims so they can scuba dive and be free from gravity's confines. This project benefited the Adaptive Diving Assoc. This was so successful, they asked us to create a pediatric fin, which we are working on this season. We love to see how our engineering skills can provide real time impact.

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.

We had an opportunity to build a robot designed to sterilize commercial airplanes. This idea came through our captain, who was a student on a Conrad Challenge team. Our students learned about NDAs and business plans involving a provisionally patented product. We created a CAD, helped redesign the prototype, revamped the BOM, then fabricated and built a prototype. The prototype helped the girls team advance to finals at the Conrad Challenge and was shown to JetBlue executives.

Essay

Why did FIRST, Disney and Lucas Films select Team 316, The LUNATECS to be featured in their “Build the Future Spotlight”? How do we make such a large STEM impact in a low-income area of South Jersey, with only 15 students? These are recent questions we have been excited to answer as we celebrate our 25th anniversary.

Engineering the Real World

Team 316 is motivated to grow and apply our skills now to solve real-world problems for others less fortunate. In Sept ‘21, we had an opportunity to build an autonomous robot designed to sterilize commercial airplanes. This prototype helped an all girls team (It’s a Girls World) compete in a global competition. Our students learned about NDAs, business plans, created a CAD, revamped the BOM, then fabricated and built a prototype. By March ‘22, the robot was given to the girls team to use in presentations at college conferences, to meet with JetBlue Ventures, and used to present at a global entrepreneurship conference.

We are passionate about finding new ways to help improve the lives of physically challenged individuals. Most recently we have been working with the Adaptive Diving Association. Team 316 designed, fabricated, and donated swim fins to spinal injury victims so they can scuba dive free from gravity’s confines. In ‘19 and ‘20 we manufactured a mold that produced 100 adult swim fins. In ‘22 we developed a pediatric version with plans to manufacture this summer. Our students gained precision engineering skills while also staying laser focused on the end user experience with their design.

Fostering STEM in the Community

We continue to seek out ways to provide STEM to the community. Over the last 4 years, we’ve partnered with Salem Community College (SCC) to support GEAR-UP (a federal, college readiness grant, offered in low income areas). To keep the grant funded, GEAR-UP is required to offer a STEM class, and we were asked to facilitate. This past summer, we hosted 50 students at our workshop, where students used our machinery and built potato cannons. During the fall ‘22 semester, our team hosted 25 students who learned the basics of coding. Since ‘20, the program had a 200% increase in participants, meaning that our efforts to engage this community have worked. In fact, many students look forward to GEAR-UP for the STEM classes.

We also wanted to focus on elementary level students, and in ‘21 we were excited to launch our first STEM summer camp (STEMQuest Adventure is a week-long science camp hosted in Pitman, NJ). Team 316 is proud to share that our ‘22 camp was a success as 25% of participants went on to join an FLL team this season. In addition, we launched the RoboQuest camp in summer ‘22 to expose upper elementary students to LEGO robotics. We hosted this camp at our workshop and noticed that 25% of campers joined a Challenge team. The third event we hosted this past summer was the Little Sparks Technology Camp in Bridgeton, NJ. When our sister FRC team (Team 5420) merged with us last year, we knew there was still a need to offer this camp as many parents rely on it each summer. Thus, we ran the camp’s 5th year with 40 students with a feature on the news website followsouthjersey.com.

We love hosting the Robot Rumble (FLL Challenge Qualifier and Explore Festival) and offering STEM activities to the younger students. The ‘23 event fielded 14 Challenge teams and 9 Explore teams, making it the largest qualifier in South Jersey. Team 316 was able to facilitate this year’s event, sending 4 teams (including 1 SJR team) to the regional competition at Rowan University. We hoped to have

inspired these young minds as we hosted tours of our workshop, provided STEM activities, and answered many questions about the next levels of FIRST.

Supporting our Programs

In '08, Team 316 incorporated into a nonprofit called South Jersey Robotics (SJR) to help with the team's sustainability and provide STEM growth in the community. Team 316 provides technical and mentoring guidance to all the SJR FIRST teams. By mentoring younger teams, we are creating a pipeline to inspire budding engineers to join Team 316 when they reach high school. This year, our team mentored 2 Challenge teams on a weekly basis. These teams both competed at the Robot Rumble Qualifier Jan '23 and 1 advanced to the regional event. In addition to mentoring individual teams, we host FastTrack sessions throughout the Fall for 4 Challenge teams to gain valuable insights on their project, robot design, and team building skills. In Jan '23 all of those teams scored at least 120 points in the robot game. We know our mentoring skills are successful as at least 3 female students are confirmed to join us for the '24 season.

To support our FIRST pipeline and financial needs, we host the Robot Run 5K & STEAMFest. Now in its 7th year, the Robot Run is the biggest community event for SJR. It might seem strange to combine running and robots, but it helps us connect with the community. Each Fall, all levels of SJR, runners, colleges, and sponsors come together to put on a fun-filled event. Through our event packets, we help spread the word about FIRST and how to get involved. In '22, we helped to host 173 runners, 8 colleges, and 7 FIRST teams. Over the past 2 years, we've had our local Dave and Buster's, a Kona Ice Truck, the Gloucester County Bomb Squad, and POP FM 99.9 radio station at the event.

Lastly, to engage with our FRC community, we have hosted an off season event, the Duel on the Delaware, for the past 20 years. In partnership with SCC and FRC Team 365, we are able to put on this 15-25 team event every fall. Being the first FMA off-season back from Covid-19, the '21 event was challenging with new logistics, but we were able to showcase our robots in action (especially to our GEAR-UP students). In '22, we were back in full swing and were proud to collect hundreds of items at this event for our Take a Byte out of Hunger food drive. In addition, we offered Impact Award practice sessions, invited our sponsors to set up information booths, and re-engaged our alumni to participate in the event.

Community Relations

In the '22 season, our team was proud to see our swim fin program on the FIRST Build the Future Blog hosted by Disney and Lucas Films (1 of 8 featured teams). The publicity continued as our work was later featured on the FIRST website's homepage. This excitement encouraged us to build a pediatric swim fin. Our adaptive device program has been well supported by key sponsorships such as Novelis, Lockheed Martin, and the Intuitive Foundation. Our team is focused on using our skills to help others in the community.

Our most valuable partnership has been with SCC as they have donated their facility space for our use to hold meetings and events. Through our relationship with the college, we have partnered to provide STEM activities via GEAR-UP to low-income families. SCC has also helped us host the FRC Duel on the Delaware event in which we were able to raise \$600 from the 50/50 fundraiser. This money was donated to SCC and is being used to support the post-secondary education of underprivileged students in the

community.

Even though we're a community team, we're still involved with our local school districts. In Spring '21, we hosted 2 events within the Penns Grove School District. At our virtual Penns Grove STEM Intensive, we reached over 1300 students. At our Penns Grove Middle School Demo, we reached 400 students. In May '22, we hosted a demo at Kingsway Regional High School for 35 of our teachers and peers. Over the summer of '22, we participated in a demo at Trinity Church, in Clayton, NJ for 40 students. The most recent and most impactful demo was at the Clearview Regional School District STEM night, for 150 people, where our robot helped the district gain referendum funding for a middle school STEM lab.

Equality

We believe that every student or mentor should be able to participate in FIRST without restriction. We are a community based team with 15 students from 3 NJ counties (Gloucester, Salem, and Camden), and 13 mentors who travel from 3 states (NJ, PA, and DE). We are diverse in other ways as our student body consists of 20% of Asian ethnicity, 20% female, and 27% homeschooled students. We meet in Salem, NJ which has a minority population of 79%, and where free and reduced lunch rate eligibility is 71%. By growing our SJR programs and providing options to engage others through programs such as GEAR-UP, Robot Run, SJR mentorship, scholarships, and summer camps, we seek to provide STEM opportunities to as many people in our community as we can.

We believe in supporting women's health to improve gender equalities by opening up the dialogue on period awareness care and breaking down social stigmas. In '22, we participated in m.e. FIRST (Menstrual Equity ambassadors who provide free period products at events) started by FRC Team 1868. Through this program we're able to fill the lack of menstrual products at FRC events, ensuring that no girl is left out of competition. In '22 we provided menstrual products at our District Events, District Championship, the FIRST Championship, and the off season events we attended. We've even expanded our chapter to FLL as we provided products at our '23 Qualifier, filling the void in younger levels. We have been recognized for this service by multiple teams and we are excited to be registered in '23 to support more events.

Developing the Future

Team 316 is energizing the next generation of problem solvers and community leaders. We're building robots, but most importantly we are developing our students who in turn are giving back and building up our community. We are looking forward to the next 25+ years! ;

