

## Chairman's Award - Team 5298

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2022 - Team 5298

**Team Number**

5298

**Team Nickname**

E-TECH CHARGERS

**Team Location**

Astoria, New York - 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.**

E-Tech Chargers FRC 5298 was established when Energy Tech High School was created, to give students in this early college school opportunities in hands-on STEM as well as business skills, teamwork, and gracious professionalism. 100 percent of our team members pursue STEM majors. Team members say that Team 5298 has helped them find their path, with many of them pursuing different fields of engineering. Graduates return and mentor, and current members take part in internships with NYC FIRST.

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

Energy Tech High School is a Title 1 school in Astoria, Queens. Team 5298 engages the community with robot demonstrations at open houses and town halls to recruit students and raise awareness. We have hosted a Hack-O-Lantern Village with the Advanced Engineering class for three consecutive years. Students designed interactive hacked pumpkins and invited members of the school and community to vote for their favorites. During the COVID-19 pandemic, we moved the event online and had over 600 views.

**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 COVID-19 pandemic brought many challenges to students, particularly in hands-on learning. This inspired team members to create a "CAD for Kids" curriculum to teach Computer-Aided Design virtually to 9th graders using the Onshape platform. We created 165 robot kits for the Brooklyn Public Library as well as the Advanced Engineering class at our school. We have reached over 270 students through our workshops and camps alone, and our team has grown by 12 students through the workshops.

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

Team 5298 recruits new members through pre-season workshops. One such workshop was a Women in STEM workshop, where we had a panel of women STEM professionals and stations where attendees got a taste of skills they would learn on the robotics team. This year, we held a design workshop where we taught the school basketball team how to screen print their own jerseys in our lab. Team members help plan and set up community events and participate in internships to run summer camps with NYC FIRST.

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

During the COVID-19 pandemic we contacted elementary and middle schools around our neighborhood about starting *FIRST* teams. In November, we started a *FIRST* Lego League Explore team for 1-3 graders at Henry David Thoreau Elementary School in Astoria, the PS17 Tigers #24606. We purchased supplies for them and are mentoring the team on a weekly basis. We will soon be hosting a workshop for PS17 using our CAD for Kids curriculum to teach them about 3D drawings and how to use 3D printers.

**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?**

Energy Tech High School formed a partnership with the STEM Center at Cornell Tech, through which two FTC teams were started, 13367 Ingenium, and 17522 Project Synthesis. Team 5298 serves as mentors for the currently active FTC 17522. Team members help run the Summer Bridge program at Energy Tech High School, and also designed and ran camps for NYC *FIRST*. We also had the opportunity to run a CAD for Kids workshop for a local Girl Scout troop.

**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**

Throughout the past few years, we have been able to create and maintain strong sponsor relationships with ConEdison, National Grid, Bloomberg, and Pershing Square Foundation. We support and work together with Laguardia Community College and Cornell Tech to empower students who are pursuing STEM. We are excited about our new partnership with Xerox, and look forward to running a summer FLL camp for the Boys and Girls Club in Stamford, Connecticut with them this summer.

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

Our school is 75% male and 25% female. We are acutely aware of the gender gap in STEM fields, and it is for this reason that we held a Women in STEM workshop, where we invited women STEM professionals to sit on a panel to share their experience to inspire the young women in our school to pursue STEM. We have both female and male mentors, and crews are led by both female and male team members. Our team is 75% minority (mainly Latino and Asian) and we hold an "All are Welcome" policy.

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

A successful team is one in which members work collaboratively and respect each other's thoughts and perspectives. This is the culture we strive to have on Team 5298. We have mentors among the faculty as well as outside professionals; alumni also come back and serve as mentors. With the support of our administration, partnership of our sponsors, and dedication of our mentors and team members, our team can continue to run effectively even as members graduate and new ones come in.

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

Team members write a reflection at the end of the season, to thank our sponsors for the impact they are making in our lives. Sponsors are recognized on our team gear and robot, and are invited to our competitions. We send updates during the season and a thank you packet at the end of the year. In 2019, we did a robot demonstration at the Career and Technical Education event at Tweed Courthouse in 2019, where over 100 business professionals from New York City were present.

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

Our team needs to continue to recruit more women to join our team. We would also like to have more representation from underserved populations, particularly Black and African Americans. This needs to begin with our school. We want to support the recruiting department by suggesting specific middle schools to reach out to, and volunteer to do robot demonstrations and presentations about our team. Next year, we would like to do two Women in STEM workshops and start planning early.

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

Team 5298 wants to fulfill the mission of *FIRST* by continuing the initiatives we have started, and engaging in more outreach that will increase awareness of the opportunities available through *FIRST* programs. We will continue to pursue starting *FIRST* teams at schools in our neighborhood, and participate in leading STEM summer camps for NYC *FIRST* and the Summer Bridge program at our school. We look forward to expanding our outreach in collaboration with Xerox this summer in Connecticut.

**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.**

Energy Tech High School's twelfth grade Advanced Engineering Class is streamlined with FRC season, so 60 students

participate in the designing and building of our FRC robot along with our 30 team members.

## Essay

The E-Tech Chargers FRC Robotics Team 5298 began in conjunction with the opening of Energy Tech High School in 2013. The vision behind the creation of our school was to provide an innovative space where hands-on Science, Technology, Education, and Math (STEM) education and opportunities are prioritized. Principal Hope Barter had been a coach of 22 public schools in New York City, some of which had FIRST Robotics Competition teams. She was so excited to witness the joy and enthusiasm of these students who were fully engaged with robot building and determined to start a team when she opened her new school. Her mission was to cultivate the spirit of a STEM community through our FRC team and get students engaged in STEM education.

During the first competing year of the E-Tech Chargers, we began with less than ten team members and one rookie tool kit. Our main coach, Louis Petrocelli, was not yet working at our school but mentored part-time. It was a struggle to teach ourselves how to create a robot from scratch with little mentoring available. There were many late-night build sessions and runs to Home Depot to buy desperately needed tools; it was hectic.

In the end, we came up with a rushed built robot called "Green Machine," which came in last place during the competition. With that underwhelming first year, our team took advantage of that first breath of FRC experience as a catalyst for growth. We learned a tremendous amount from other teams' strategies and designs. We obtained more experienced mentors and sufficient funding from our sponsors. Overall, our founding team members were determined to continue raising a better legacy for the team.

Our robots have been improving every year. They have gotten more efficient and precise with all the new parts, machines, and applied engineering skills we've acquired. We no longer need to start from scratch, a relieving moment for our team. Coming out of our shell was a significant step in becoming more known, we were able to create relationships with Stuyvesant, Townsend Harris, and La Salle Academy team members who graciously helped us with our robot during the competition. Finally, the E-Tech Chargers climbed out of that rookie hole and into the spotlight to be a well-known team in New York City; we were one spot away from making it to the playoffs in 2019.

In May of 2019, team members did a robot demo at the Career and Technical Education (CTE) partner appreciation event at Tweed Courthouse, where over 100 New York City business professionals were present. We even did a demonstration on the 7 train on our way there, seizing the opportunity to share with local commuters about FIRST.

In the fall of 2019, our team gained a new coach, Joel Bianchi, who came in with 14 years of experience with the Harlem Knights Robotics FRC Team 1660. He met with eager veterans and faculty members and mentors, and structured the team into crews: mechanical (drivetrain / manipulator), construction, programming, electrical, and business. We ran pre-season workshops and grew our team from 15 to 60 members. In a school that has a 3:1 male to female ratio with very little female representation, we held a Women in STEM workshop to recruit and empower female students to join the team and pursue STEM pathways. We were honored to host a panel with women professionals from Con Edison, Accenture, and the Department of Education, and team members led stations that gave female students a taste of things they would learn and do on the robotics team. We built a beautiful robot which we named "Chompy" to compete in Infinite Recharge. Our business crew submitted for awards for the first time in our team history; however, the week we were going to leave for our first regional competition, New York went into lockdown due to the COVID-19 pandemic. We had meetings online for the next year and a half, with our own Isaiah Wilson becoming a Dean's List finalist in New York City in 2020.

In the 2021 season, we moved our team's communication platform over from Slack to Discord, which gave us all the functionalities of Slack and Zoom combined, and was already a commonly-used platform for our team members. We sent out at-home robot kits to team members, so that we could brainstorm and build "together" even while physically apart. We brainstormed ideas for the Innovation Challenge, and while we did not end up presenting, we enjoyed hearty discussions and learned how to conduct surveys and collect data. We concluded the season by researching and contacting elementary and middle schools around our neighborhood about starting FIRST teams.

During the pandemic, team members Naomi Cordero and Victoria Cai wanted to support the freshmen who were missing out on the hands-on learning opportunities in the Foundations of Engineering class, so they created a curriculum called "CAD for Kids," in which they taught freshmen how to draw Computer-Aided Drawings using Onshape. They created a lesson plan, ran workshops via zoom, and shared videos and information about our FTC and FRC teams. The first lesson on creating a claw bot model was such a success that a second one was created, where students learned to take a 2D Among Us drawing and convert it into a 3D model. We reached 116 freshman students through this, and since then, twelve students have joined either our FTC or FRC team.

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Over the summer of 2021, team members helped lead CAD for Kids workshops for 60 students at Energy Tech High School's Summer Bridge program, and ran summer camps for 64 students as an internship with NYC FIRST. We created and assembled 165 "Robot in a Box" packages that were distributed for free through the Brooklyn Public Library system, complete with instructions and video tutorials. In the fall, we were able to conduct an in-person "CAD for Kids" workshop for a Girl Scout Troop at the STEM Center. They created and drew 3D mythical creatures on Tinkercad, then printed them with 3D printers.

As our city emerged from the COVID-19 pandemic, our team learned to adapt and adjust to limited hours in the building and last minute changes that came with waves of different variants. We learned to build a robot while social distancing and wearing masks. We held as many workshops as we were allowed to. One workshop was for the school basketball team, who was in danger of not being able to compete because the jerseys they had ordered would not arrive in time for their first three games. We were excited to teach them how to screen print their own jerseys!

In October, we participated in RoboRama, an off-season event at Francis Lewis Academy. It was the first FRC competition for almost everyone on the team, including the seniors. We loved the experience and were ranked third after the qualification matches. We were excited to see Chompy doing successful climbs at the end of each match!

This year in November, we started a pilot FIRST Lego League Explore team for 1-3 graders at Henry David Thoreau Elementary School in Astoria, the PS17Q Tigers #24606. We purchased supplies for them and are mentoring the team on a weekly basis. Over 80 students expressed interest in joining the team, so we are planning to host a workshop for PS17 to teach more students to do 3D CAD drawings and teach them how to use 3D printers. We will continue supporting PS17Q in expanding access to more students and discuss the possibility of upgrading to an FLL Challenge team. Many of our senior team members have also been mentoring younger students on E-Tech Chargers FTC Team 17522, which meets at the STEM Center at Cornell Tech.

In our mission to spread awareness and accessibility of hands-on STEM education, we have hosted a Hack-O-Lantern Village with the Advanced Engineering class for three consecutive years. Students designed interactive "hacked" pumpkins and invited members of the school and community to vote for their favorites during the week of Halloween. In 2019, we held the event in our lobby, and elementary and middle school students came as part of their after school program to see how high school students were using their science and engineering skills to make interactive creations. During the COVID-19 pandemic, we moved the event online using the Flipgrid platform. We sent sensors and Arduino kits, and students uploaded videos of their creation. Our virtual Hack-o-lantern village had over 600 views. In 2021, we had our event outdoors in a public park. We had many excited young students come and vote, as well as families that were at the park. This latest event reached 200 people in our community.

Building a robot is not our only mission. As individuals, we have each received and gained so much through the generosity of our sponsors and the faith of our mentors, and we want more people to share these opportunities with us. We are deeply grateful to Con Edison, National Grid, Mr. and Mrs. Robert Schwartz, Bloomberg, Pershing Square, and Xerox; we wouldn't be able to have a team without their generous support! As ones who have received abundantly, we also seek to give back to our community with the same fervor.

We have constructed our legacy from the ground up, and are excited to be part of a thriving, growing team. The robotics community we have created welcomes everyone, no matter where you come from or what STEM experience you have. Here you are accepted, loved, and can expect to grow and thrive in a nurturing and inspiring environment. This is us, the E-Tech Chargers Robotics FRC Team 5298.