

Chairman's Award - Team 1710

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2022 - Team 1710

Team Number

1710

Team Nickname

The Ravonics Revolution

Team Location

Olathe, Kansas - 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.

FIRST gives the members of Team 1710 a variety of real-world skills. Through FIRST challenges, members are required to develop discipline, time management, and various other technical skills to compete with top teams around the world.

These skills give our members the upper hand in obtaining jobs wherever they go. All of our alumni have graduated high school, 100% attend college, and a staggering 92% of them are pursuing STEM fields in post-secondary school.

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

Team 1710 is located in Olathe, Kansas, which is home to a diverse community, including students who speak 82 different languages and the Kansas School for the Deaf (KSD). The varying backgrounds of Olathe residents create opportunities for our team to interact with people from many different walks of life. Specifically, we have hosted workshops, mentored, and helped start 3 FLL teams at KSD. We connect with many of these people on a regular basis through our initiatives and outreach events.

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?

Social media posts and outreach events are a few of the ways we spread the message of FIRST. We have recently created a TikTok account to share engaging, informative videos. Additionally, we have expanded our outreach in the past three years by creating virtual options for our programs and hosting events for underrepresented groups, such as our You Go Girl (YGG) workshop. In addition, we implemented a series of Scratch programming lessons to encourage youth coding in our community.

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 1710 establishes itself as a role model within FIRST through our initiative, You Go Girl where we welcome women into the STEM community. In addition, through our You Are Not Alone initiative we educate team members on how to cope with their mental health, something we have extended to other FIRST teams through our speaker series. Additionally, every year our team hosts an FLL qualifier for local teams where we volunteer as MCs, referees, judges, and more.

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 extremely involved with FLL teams and other *FIRST* teams. We helped start and continue to mentor FTC team 17210. Additionally, we helped start and mentored the 3 Kansas School for the Deaf teams. We assist many of the FLL teams in our area by hosting an annual FLL qualifier at our school and refereeing and volunteering at other events. Additionally, after our annual summer camp we host a meeting with parents sharing information on what *FIRST* is and the process of starting an FLL team.

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?

Our team reaches over 4,000 people each year in events intended to teach STEM and explore robotics. We interact with younger students by doing presentations and activities at local schools, STEM clubs, and hosting events, such as YGG, summer, and winter workshops. In addition, our initiatives empower students from minority groups to be part of the STEM community. For example, from the YGG camp we hosted, 25% of students originally indicated an interest in STEM. After the event, this grew to 80%!

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

Our team loves working with younger students to teach them about engineering, programming, sustainability, and collaboration. Recently, we took our outreach robot to an event with Code Ninjas, one of our sponsors, and taught participants how to drive our robot, while explaining the engineering process. 1710 and the Society of Women Engineers (SWE) formed a partnership to host luncheons at *FIRST* regionals and they have helped financially support our newest program *FIRST* Fund.

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

Team 1710 promotes diversity, equity, and inclusion through our initiatives. Our You Go Girl (YGG) initiative has helped other teams work together to promote women's involvement in STEM. Last year, we hosted our first YGG workshop to teach young girls about STEM. Through our Rainbow Alliance initiative, we focus on promoting and sharing an inclusive, diverse environment, and have created a diversity statement to promote diversity in STEM fields.

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

Team 1710 is organized into subteams, each with a student leader. This creates a cycle of students passing on accumulated knowledge; new members are educated by returning members in their subteam. We have used this system for 17 years, proving to be successful and sustainable. This design has supported our initiatives' success, as knowledge is continually passed down through the years. Additionally, in 2020, we implemented a subteam dedicated to maintaining the team's initiatives.

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

Our team engages potential sponsors by showing how their contributions support our team. We go out into our community and give presentations about our team to businesses. To recognize our sponsors we display their logos on our robot and other merchandise. Additionally, the CEO of a sponsoring engineering firm came and spoke to the team about leadership. New this year, we have partnered with a local pizza distributor who donated pizzas for the team to sell at home basketball games.

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

Recently, we identified inefficiencies in the construction of our robot. To improve, we reorganized our storage areas, mobilized our workspaces, focused on building high fidelity prototypes, and restructured the build subteam. We found that having smaller groups specialized in certain skills and implementing a zip tie certification system for safety and skill identification has improved our robot construction efficiency.

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

To fulfill the mission of *FIRST*, we seek to impact and include all communities in STEM. Through our You Go Girl and Rainbow Alliance initiatives we educate our team and community so we can support those identifying as women, LGBTQ+ and BIPOC in STEM. We show our support through social media campaigns that highlight the contributions of these groups to STEM. We internally conduct monthly climate surveys with our team to make sure the inclusive, diverse environment we promote consistently happens.

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 created two new programs to assist others in the *FIRST* community. *FIRST* Exchange encourages cooperation and the exchange of resources among *FIRST* programs. We created the website for teams to donate parts to other teams in

need. FIRST Fund is designed to assist teams with needed funding and mentorship. Each team affected by FIRST Fund also receives a financial handbook to help with future financial success. Both of these innovative programs are designed to bring balance to the playing field.

Essay

Team 1710 is a pillar in our community. We believe that innovation through inclusion is the future. We are building the next generation of leaders in an inclusive and welcoming environment because we believe that STEM is for everyone. Most importantly we reach beyond ourselves to spread STEM.

Mental health illnesses are pervasive in modern society, especially among teens. In 2017, Team 1710 started You Are Not Alone (YANA), our mental health initiative. Within our team, we began mental health hours during build season, provided counselors for team members, and started an annual speaker series to discuss mental health. We expanded the reach of YANA to our community by putting mental health related posters throughout our school district, meeting with a group of local counselors to discuss our research, and interviewing local first responders about their mental health coping mechanisms. In 2020, we hosted a mental health seminar at the Greater Kansas City Regional featuring speaker Jack Sernett. During the pandemic, we developed a mental health social media campaign partnering with Teams 1108, 1730, 1806, and 3928 to share coping mechanisms. These posts were viewed over 48,000 times and some were retweeted by the FIRST official account.

Rainbow Alliance was formed by Team 1710 to support the LGBTQ+ and Black and Indigneous People of Color (BIPOC) communities. We want to show underrepresented communities that they belong in STEM so Team 1710 created buttons and posters to hand out at competitions to spread inclusivity to other FIRST teams. We also created a diversity video that other teams can watch to see how Team 1710 promotes diversity beyond ourselves. We make social media posts during African American History Month, Pride Month, and Asian American Pacific Islander Month. These posts feature different influential figures in STEM to bring awareness to their achievements. At the 2020 GKC regional, members of Team 1710 wore buttons identifying their pronouns. We experienced some resistance, but we stood by our team values in actively fostering an inclusive environment.

You Go Girl (YGG), our team's oldest initiative, seeks to empower women in STEM. Our team creates materials such as T-shirts, buttons, trading cards, and posters that are displayed at events, in elementary and middle school classrooms, and in our workrooms to build a norm of women in STEM. These posters, featuring each of the team's women, not only instill a sense of pride in the female members of Team 1710 but also inspire future generations. Many of our female team members were inspired to join the team after seeing the posters hanging up in their classrooms or in our workrooms while attending workshops or other events as middle schoolers. 1710 has inspired thousands of young girls through this initiative. Last year at our first YGG workshop we asked girls if they see themselves going into a STEM-related career. Before the camp, only 25% said yes. However, after the camp, the results more than tripled with 80% of students saying they were very likely to go into a STEM career! In addition, 90% of the people that came to the camp said they would love to attend future camps.

Outreach to our community, especially to underserved populations, is the cornerstone of Team 1710. This season, our team members have participated in over 900 hours of outreach at more than 15 events and reached more than 4000 people. We are projected to hold more than 60 events, reaching thousands more people by the end of the school year. Annually, we host a STEM winter workshop and 16 summer camp sessions to teach students grades 3-8 about engineering, programming, and LEGO robotics. Each year we develop a unique curriculum for these camps, culminating in an FLL style game designed by our team. This year, we are creating our second LEGO Robotics game entitled 'Cosmic Craze' with 10 unique challenges for students to work through. We partner with local community organizations around Kansas City. Our team works with students at the Kansas School for the Deaf (KSD). We held LEGO workshops at KSD and assisted them in starting 3 FLL teams. We also mentor a local middle school STEM club before school twice a week. We give presentations around the city; most notably, robotics demonstrations at Science City, the regional Code Ninjas showcase, Boy Scouts, Girl Scouts, and local elementary and middle schools. With each partnership, our goal is simple: to look beyond ourselves, excite the next generation, and provide them opportunities to engage in STEM activities.

Team 1710 connected with Children's Mercy Hospital through a teammate who battled leukemia. We wanted to give back to a place that does so much good in our community and provide their long-term patients a distraction from day-to-day treatment and illness. Through speaking with medical staff, we identified LEGOs as the optimal STEM activity because they are easily sterilized and are user friendly. We launched our annual LEGO Drive, which was a huge success and we donated over 120 LEGO kits to Children's Mercy Kansas City. This year we have aspirations to expand with a goal of receiving over 200 kits. The gratitude we receive from parents and children alike inspires us to continue the LEGO Drive. Future plans for this program include expanding to local domestic violence shelters.

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Our team structure mirrors the corporate world with nine subteams, each with an experienced student leader focused on a different aspect of FIRST. Student leaders collaborate with other leaders, their subteam and mentors to assemble comprehensive plans based on real world management training, complete with SMART goals. Leaders are responsible for communication, getting buy-in from their subteams, and accomplishing deliverables within their budget and time constraints. To ensure knowledge is retained through the years, leaders train their subteams and create a handbook to pass down. These handbooks ensure that the wisdom of previous leaders is always accessible and guarantees long-term sustainability.

Sustaining is also key for team funding. While the district graciously provides facilities and coach stipends, the remaining expenses are the responsibility of the team. Each year we raise the funds necessary to cover our expenses through sponsorships, grants, and fundraisers. To ensure success, we outline projected expenses, income, and risk management in a business plan. Two notable fundraisers are the Letter Writing Campaign (LWC) and coffee sales. For the LWC every member of our team sends letters to parents, relatives and friends all over the world, telling them about what FIRST is and what our team does. These letters serve as an excellent way to spread the message of FIRST and Team 1710 and give the recipients the opportunity to support us. Our coffee comes from a family owned business in Nicaragua and is ethically sourced and to reflect team values of diversity and fairness.

Goof Proof, our team's safety initiative, was created to spread the ideas of shop and general safety. To extend our safety initiative beyond our team we create a safety handbook and distribute safety themed buttons at competitions and other events. The items include buttons, an animation, posters, t-shirts, and a safety card game featuring The Safety Squad: a group of superhero inspired characters we created to demonstrate safety practices. We implement these practices in our team through our shop safety system, inspired by Team 4786, using color coded zip ties attached to each member's safety glasses to indicate their proficiency on each machine.

Based on our core value of student leadership, the entire robot is student designed, built, and programmed. Our design process involves using numeric data gathered from prototypes and mathematical based decisions. We used data from shooter prototypes to map out shot distances and hood angles. Each year Team 1710 pushes the quality of the robot forward. One innovation is the implementation of a swerve drive. During the COVID shutdown in the spring and summer of 2020, Team 1710 collaborated to develop this drive train in a safe, pandemic friendly manner. We created construction kits that were sent to individual team members' houses, constructed, sterilized, then sent in for final assembly. The result of this work was the most agile drivetrain in team history which is now used on our outreach bot. To share our learning, we shared our swerve drive code on GitHub, which was copied by over 185 users and seen by over 4.1K on Chief Delphi.

In the spirit of gracious professionalism and cooperation, 1710 seeks to ease the financial strain and lack of mentor resources teams can sometimes experience through the creation of FIRST Fund. This first of its kind program seeks to connect FIRST teams to mentor and monetary support. In order to do this, we sent out mentor applications to more than 20 local companies, held fundraisers, and received more than \$3,000 in donations. We sent emails to teams in the local area and reached out to the KC STEM Alliance to find teams that may need assistance. We also created a financial handbook to share with these teams to help provide financial guidance and fundraising ideas so they may become a sustainable team.

In an effort to look beyond ourselves, we created FIRST Exchange; a website where FIRST teams can post gently used materials for other FIRST teams to claim, paying only for shipping. This program not only decreases costs for teams and encourages cooperation, but also limits the FIRST ecological footprint. This is the pilot year of FIRST exchange, to advertise this new program, we posted it on our social media and Chief Delphi.

Team 1710 will continue to reach the members of our community and beyond while innovating its methods, using the diverse background of its members. As a 17 year-old FIRST team, we continue to innovate and inspire our community by reaching beyond ourselves.