

Chairman's Award - Team 2526

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2021 - Team 2526

Team Number

2526

Team Nickname

Crimson Robotics

Team Location

Osseo, Minnesota - 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 has enabled the members of Crimson Robotics to develop invaluable skills and experience for their future endeavors. With 82% of members planning on pursuing a career in STEM and 56% having their career choices influenced by their time on Team 2526, FIRST robotics provides a first step into the world of engineering. 100% of our members graduate high school, and all are equipped with practical experience and knowledge as they venture into higher education and the workplace.

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

Located in the fourth largest district in Minnesota, our location has given us the opportunity to spread robotics to a large number of schools where it would otherwise not exist. In this pursuit, Team 2526 recognizes the importance of addressing the socioeconomic challenges in District 279, and has ensured that all students are able to participate in FIRST programs. In addition to non-FIRST initiatives, Crimson Robotics has initiated 38 FLL, FLL Jr., and FTC teams in our district.

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?

Abiding by our mission to provide robotics to every student, in every grade, in every school, in our district, we hosted the largest joint FTC, FLL, and FLL Jr. competition in Minnesota in December of 2019. Regardless of socioeconomic status, we never turn students away. We work with each school's administration to ensure all students have the opportunities of robotics. Through Crimson Classroom, 2526 has provided opportunities to experience engineering in school for 520+ students since 2019.

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

Crimson Robotics is primarily a student-run organization, with over half of our team holding at least one leadership position. Each of our four departments—Administration, Business, Engineering, and Outreach—are led by elected student co-captains, who also run team meetings. In total, Team 2526 has 45 leadership positions, ranging from Electrical to Fundraising Lead. In the community, our members act as mentors for FLL and FLL Jr. teams and visit elementary schools to showcase FIRST and STEM.

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

Crimson Robotics is dedicated to spreading the opportunities of robotics to every student in ISD 279. Over the last 5 years, we started 26 FLL, 15 FLL Jr, & 7 FTC teams in ISD 279 as well as 6 FLL Jr. teams in Singapore. In addition to developing an FLL Jr. and FLL curriculum & working with local businesses to fund our initiated teams, we have consistently mentored many of these teams. Members of Team 2526 play an active role in maintaining the programs we have started throughout our district.

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?

Beyond official FIRST programs, Team 2526 has engaged in multiple initiatives to spread STEM in our community, including events held in classrooms throughout our district, volunteering at STEM nights in elementary schools, panels about women in STEM, and programs for local girl scouts troops. Through Crimson Classroom, our elementary school robotics curriculum, Team 2526 has provided opportunities to experience engineering in the classroom for over 500 students in the past 3 years.

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

Team 2526 has developed robust partnerships with schools, sponsors, and other organizations. Our relationships with schools have allowed us to better serve our community, running FIRST programs, volunteering at STEM nights, and holding classroom visits. In 2019, we partnered with High Tech Kids to host an FTC, FLL, and FLL Jr. Tournament for 127 teams—the largest in the state. In addition to funding, some of our sponsors have provided us with mentors, allowing them to become a part of our team.

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

In 2017, Team 2526 established Crimson GEARs (Girls in Engineering and Robotics), a program that creates an environment for women to express their passions in STEM within the team and our community. Over the past 3 years, it has helped local Girl Scouts receive numerous STEM badges, built a robot for outreach demonstrations, and hosted a career panel featuring women in STEM. GEARs' efforts have resulted in a more equitable team, with a near-majority of leadership roles now held by women.

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

Team 2526 strongly encourages new members to participate in our FTC program, which introduces new members to the core values of FIRST and skills important on our team. Returning members act as mentors and allow new members to develop independent solutions to problems. Our new Skill Duck program also serves to ensure that the knowledge of our team is passed on through the years. Combined, these two programs ensure the continued sustainability of our team and our initiatives.

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

Recruiting sponsors is a full-team effort. Each year, all members of Crimson Robotics take part in cold-calling, reaching out to hundreds of local businesses. We then work to keep sponsors involved in our team year-round, updating them with bi-monthly newsletters and social media posts. Team members visit our sponsors and give presentations, sharing new information on our progress and giving robot demos. Additionally, they are invited to our annual banquet, where they are presented with plaques.

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

This past season, we have seen a significant decline in new and returning members. Rookies on our team are encouraged to participate in FTC, which provides them with the opportunity to get to know other team members, form connections, and develop foundational skills for FRC. We are working to better integrate new members into our team by reformatting our FTC program, expanding recruitment events, and using our Skill Ducks program in order to ensure that new members find their place on our team.

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

Since its inception in 2007, Crimson Robotics has strived to spread the opportunities of robotics and STEM. 2526 has expanded the impact of FIRST within our community, throughout the nation, & all six habitable continents. With 54 FLL Jr., FLL, FTC programs initiated, we provide FIRST regardless of socioeconomic status or location. Our global initiative, Crimson Global, allows us to spread FIRST beyond our own community, and has initiated FIRST programs in South Africa, Brazil, and Singapore.

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.

Throughout the last 14 years, Crimson Robotics has worked to provide robotics to every student regardless of socioeconomic status or location. This has resulted in our Skill Duck program. Skill Ducks are online curriculums based on all departments of our team, from programming to fundraising, that can easily pass on knowledge and skills to new members. Implemented last year, Skill Ducks are designed to allow any FRC team to embrace all opportunities of robotics for years to come.

Essay

FIRST at Home:

In 2007, Team 2526: Crimson Robotics, from Maple Grove, Minnesota, started our rookie season with ten students and a single mentor. Over the past 14 years, our team has grown to a peak of 18 mentors and over 60 students. Crimson Robotics is a student-run organization, with elected co-captains leading each of the team's four departments: administration, engineering, business, and outreach. In total, over 50% of members hold a leadership position. From the first meeting a rookie attends to their last before graduation, Team 2526 offers the opportunity to explore all aspects of robotics.

Administration serves as the foundation of Crimson Robotics. The department oversees all of the team's logistics, ranging from managing the registration of members each year and tracking attendance to ensuring that there are snacks available at all meetings. Since 2017, administration has been in charge of Crimson GEARS (Girls in Engineering and Robotics), a program that facilitates an environment for women to express their passions in STEM within the team and our community. Thanks to GEARS' efforts, our team has grown to become over 30% female.

The engineering department of Team 2526 encompasses mechanical and electrical engineering, programming, and pneumatics: everything needed to create a functioning robot. First-year members participate in a fall FTC season to expose them to the engineering process. FRC begins with a cost-benefit analysis involving all team members and mentors, culminating in a series of votes to decide on the tasks we want to accomplish and what type of robot can best serve those purposes. The season then progresses at a rapid pace, with all parts of the robot prototyped, CADed, and machined before finally being incorporated into a final product—in recent years, an increasing number of parts have been 3D printed.

Business on Team 2526 serves the vital purpose of making everything our team does possible. The business department leads all of our fundraising efforts, including grant applications, cold-calling businesses, restaurant fundraisers, and annual full-team fundraisers selling Krispy Kreme donuts and Gertens plants. In total, our budget this year is \$124,485, funding Crimson Robotics' outreach programs, FTC, FRC, and event fees. In addition, our team is able to reduce travel expenses to ensure that all team members can attend competitions regardless of cost.

FIRST in Our Community:

Crimson Robotics is an established and ever-growing presence in our school district; over one third of our members enter our team having been involved in FLL and FLL Jr. programs in the past. In 2015, we created a plan to spread the opportunities of robotics to every student, in every grade, in every school in ISD 279—the fifth largest district in the state of Minnesota, encompassing 3 high schools, 4 middle schools, and 17 elementary schools. Since then, we have initiated a total of 44 FIRST teams, 38 of which are within our district.

Our efforts started at the high school level, seeking to ensure that robotics was available to all students at the Osseo, Park Center, and Maple Grove high schools. After helping to stabilize Osseo Senior High's VEX robotics program, we worked with staff and students at Park Center Senior High to restart their FRC program: Team 3291, the Au Pirates. After missing two seasons, our mentorship helped them reestablish their team and compete in 2016—they have continued to do so in the years since. Crimson Robotics then moved on to providing robotics to all of the middle schools in our district, initiating FLL teams in each of the 4 schools. In order to ensure the success and sustainability of these programs, our members served as mentors for these teams.

Since 2016 we have actively involved students in all 17 of District 279's elementary schools in robotics through a combination of FIRST teams and classroom visits. Having started a total of 38 FLL, FLL Jr., and FTC teams in our district, Crimson Robotics has provided access to the opportunities of FIRST throughout our community. In addition to initiating these programs, our team members have frequently served as mentors. To reach all schools in our district, Crimson Robotics started a new initiative in 2018: Crimson Classroom. With this new program, Team 2526 provides students with the opportunity to explore engineering right in the classroom. We work with students to program WeDo 2.0 kits, build LEGO Mindstorm robots, and drive FTC robots. Students also learn about engineering and robotics through activity stations.

FIRST in Our Nation:

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Crimson Robotics' mission is to provide the opportunities of robotics to every child, in every grade, in every school. A big step was taken in 2017, as we spread FIRST programs to our community by hosting 2 FLL tournaments and 2 FLL Jr. expos. The success of this tournament motivated us to host an FTC, FLL, and FLL Jr. Tournament/Expo with High Tech Kids in 2019 at Maple Grove Senior High. Our tournament was Minnesota's largest; with 127 FIRST teams competing, the event offered the opportunity to compete to many students throughout our state.

However, our efforts have not just been confined to our local area. With the help of other teams in other communities, we have been able to extend our reach to people all over the state. Spreading FIRST throughout Minnesota, we demonstrate Gracious Professionalism by supporting fellow FRC teams. We collaborated with Team 1816 by attending the 2019 Minnesota Advocacy Conference and shared parts with Team 3291. To help spread FIRST throughout the nation, we reached out to Team 6974 Zia Robotics in New Mexico. We shared our cost-benefit analysis method with Zia, and one of our members joined them during kickoff.

Connecting with teams far away and establishing new programs and connections is always a challenge—especially given the circumstances introduced by the COVID-19 pandemic—but with our new program, Skill Ducks, helping, connecting, and collaborating with other teams has never been easier. With Skill Ducks, Team 2526 is able to extend our reach beyond the confines of our district, spreading our mission on a scale that will reach schools across the nation with the help of other teams just like us. The Skill Ducks program is a training curriculum to ensure FIRST's sustainability. From CADing basics to Cold Calling to how to mentor an FLL team, Skill Ducks are a way to pass on valuable knowledge to new members. With Skill Ducks, everyone is allowed to learn at their own pace. In case a rookie is unsure of what they want to pursue, Skill Ducks can allow them to explore different areas and find their role within FIRST. Additionally, we have posted these Skill Ducks documents on our website for everyone to access. Skill Ducks allow both rookie and veteran FRC teams to gain experience from a standardized curriculum.

FIRST Around the World:

Team 2526 has demonstrated our commitment to spreading FIRST around the world through our Crimson Global initiative. Founded in 2017, Crimson Global has allowed us to connect with other teams around the world, including Team 3132 Thunder Down Under, in Australia. Through this partnership we were able to join FIRST Global. We have also mentored the FIRST Global team from Bosnia and Herzegovina via Skype. Bakir Kapetanovi?, one of the students we mentored, remarked, "This is not just a competition. For us, this is a gateway into the world."

That same year, we worked with Parkwood Primary School in South Africa to initiate and fund a LEGO Robotics program. Moving into 2018, we continued our efforts to spread the values of FIRST by initiating an FLL Jr. team in Punggol Meadows, Singapore. By 2020, this program had grown to six teams. In 2019 we reached out to FRC Team 5985, Project Bucephalus from Australia, to spread FIRST outside of the classroom in each of our respective communities. Combining each of our nation's scouting programs, our teams collaborated to write a joint badge curriculum to spread FIRST robotics to scouting groups.

Also in 2020, we collaborated with Team 1156 Under Control as well as FLL Team Migbotics, from Brazil and Uruguay, respectively, to develop a trilingual FLL curriculum written in English, Spanish, and Portuguese. Last season, 37 schools used the publicly released program in their communities. Our curriculum covers costs, registration, and the FLL competition. After the success of the previous guide, we collaborated with 1156 to write a trilingual FTC curriculum. Following the same process, this guide helps introduce FTC into communities in South America. We hope the multilingual curriculum will allow a wider range of communities to take part in FIRST Robotics.

FIRST Moving Forward:

The COVID-19 pandemic has affected all areas of our team, including our outreach efforts. A lack of in-person contact with our community has reduced our impact in our district, and our communications with national and international teams has been strained. Despite these challenges, Crimson Robotics is poised to emerge from the pandemic stronger than ever. With our Skill Ducks program, we have an opportunity to not only ensure the sustainability of our own team, but also to increase our impact on teams across the country. In pursuit of this goal, we have recently begun sending out our Skill Ducks to other teams for feedback—so far, we have been in contact with 15 teams across the country about the program. We have also sought to engage with our community virtually, and have begun collaborating with Team 2169 King Tec to develop a virtual curriculum for elementary school classrooms. Our team recognizes that the COVID-19 pandemic has exacerbated the lack of STEM education and socioeconomic disparities in many places around the world, and we believe that this represents an important opportunity to not only rebuild, but strengthen Crimson Robotics.