

Chairman's Award - Team 2526

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2020 - Team 2526

Team Number

2526

Team Name, Corporate/University Sponsors

Boston Scientific / TURCK Inc. / Premier Banks / Hitesman & Wold PA / Maple Grove Lions Club / Tennant / UAS Labs / Banner Engineering / National Engineering Resources / RJM Construction / Medtronic / International Computer Appliances / Industrial Tool, Inc. / N.A.S.A. / Lockheed Martin / Development Resource Group & Family/Community & Maple Grove Senior High School

Briefly describe the impact of the *FIRST* program on team participants within the last five years.

For students of Crimson Robotics, *FIRST* enables members to develop into critical thinkers and problem solvers. 93% of our students plan on pursuing a career influenced by their time on Crimson Robotics, 80% plan on majoring in STEM, and 100% graduate. From their rookie year, students undergo Gracious Professionalism and Cooperation training. Between *FIRST* values and *FIRST* scholarships, Team 2526 is developing for post-secondary education and beyond.

Describe the impact of the *FIRST* program on your community within the last five years.

In order to combat the scarcity of robotics prior to our existence, Crimson Robotics introduced FLL Jr., FLL, and FTC to District 279. Over the past five years, we have initiated 44 *FIRST* Robotics teams. Our students mentor these teams throughout the fourth-largest district in the state: ISD 279. Since the start of this school year, our classroom visits, Girl Scout Badge Sessions, and robot demonstrations have reached more than 450 students in addition to STEM Nights and science fairs.

Describe the team's methods for spreading the *FIRST* message in ways that are effective, scalable, sustainable, and creative.

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 this December. 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 the classroom for 420+ students since 2019.

Describe examples of how your team members act as role models and inspire other *FIRST* team members to emulate

With 41% of our students holding a leadership position, Team 2526 cultivates students for the future. Four captains lead each department, Administration, Business, Engineering, and Outreach. In addition to the captains, our team hosts 42 other positions. Student responsibilities range from Electrical Lead to our head Writer. 46% of veterans mentor an FLL Jr. or FLL team outside of Team 2526. With 21 rookies incoming this year, our team's sustainability is ensured for the future.

Describe the team's initiatives to help start or form other FRC teams

5 years ago, 2526 dedicated itself to help restart FRC Team 3291 at Park Center Senior High. Team 2526 provided them with mentorship, as we shared tools and equipment to help restart their team. Today, this has turned into a partnership where both teams attend parades, mentor FLL programs, and host FIRST tournaments together. Since 2018, Crimson Robotics has mentored Team 6974 from New Mexico. We advise Zia Robotics through all aspects of FIRST from fundraising to programming.

Describe the team's initiatives to help start or form other FIRST teams (including Jr.FLL, FLL, & FTC)

In 2015, 2526 created a plan to spread the opportunities of robotics to every student, in every grade, in every school in ISD 279. We developed an FLL Jr. and FLL curriculum & worked with local businesses to fund our initiated teams. In 2016, Team 2526 started FLL teams in our district's 4 middle schools. The next year we expanded programs to ISD 279's 17 elementary schools. Over the last 5 years, we started 18 FLL, 13 FLL Jr, & 7 FTC teams in ISD 279 as well as 6 FLL Jr. teams in Singapore.

Describe the team's initiatives on assisting other FIRST teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the FIRST program

In addition to initiating 44 FIRST teams, we provide a curriculum for each of our associate teams. These curriculums allow a weekly schedule for each FIRST program as they progress through their build season and allows teams to later become self-sustainable. To guide teams through the design process, we have shared our Cost-Benefit Analysis method to team 6974, Zia Robotics, and the FIRST Global Bosnia team.

Describe how your team works with other FIRST teams to serve as mentors to younger or less experienced FIRST teams (includes Jr.FLL, FLL, FTC, & FRC teams)

In ISD 279, students struggle with transportation and financial needs. To combat this, Team 2526 ran 4 FLL Jr. Expos, 4 FLL & 2 FTC competitions at our school in 2019, and at Park Center Senior High in 2017. In addition, we designed a trilingual FTC & FLL guide for South and Central America in collaboration with Under Control from Brazil and Team Migbotics from Uruguay. In its first year the FLL & FTC guides have reached 47 teams across South America, spreading FIRST to underserved communities.

Describe your Corporate/University Sponsors

Team 2526 works with 18 sponsors which contribute \$22,000 to our \$143,000 budget. With an 83% return-rate, our sponsors enabled us to fund over 45 outreach events, machine robot parts, and purchase a new 3D printer. In addition, sponsors have provided 5 of our mentors who help guide students along the build season in everything from programming to business. We update our sponsors with a bi-monthly newsletter and social media updates along with presenting them a plaque at our annual banquet.

Describe the strength of your partnership with your sponsors within the last five years.

This year, Crimson Robotics hosted a community-wide presentation for 10+ potential sponsors at Cyber Advisors IT Support. Our partnership with Tenant allows us to machine our parts annually. At our yearly sponsorship presentations, we update our contributors with new information on our progress and a robot demo. In addition, we publicly show our appreciation to our sponsors through social media posts resulting in 450+ likes and comments.

Describe how your team would explain what FIRST is to someone who has never heard of it

FIRST is an international robotics competition that brings direct real-world STEM experience to students of all ages. FIRST promotes a generation compiled of tomorrow's innovators and problem-solvers. Guided by values of Gracious Professionalism and Cooperation, FIRST encourages learning in and out of the classroom. FIRST allows the opportunities of robotics to every student, regardless of circumstance.

Briefly describe other matters of interest to the FIRST judges, if any

Throughout the last 13 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 written, designed curriculums based off all departments on our team, from programming to fundraising. Implemented this year, Skill Ducks are designed to allow any FRC team to embrace all opportunities of robotics for years to come.

For FRC teams older than 5 years, briefly describe your team's broader impact from its inception.

In 2007, our team started as 10 students & 2 mentors. Now we've grown to 64 students and 18 mentors. 2526 expanded the impact of FIRST within our community, throughout the nation, & all six habitable continents. With 44 FLL Jr., FLL, FTC programs initiated, we provide the FIRST regardless of socioeconomic status or location. Our global initiative, Crimson Global, allows us to spread FIRST beyond our own community. Today, we have initiated FIRST programs globally including South Africa & Brazil.

Team Captain/Student Representative that has double-checked this submission.

Sahana Vandayar

Essay

In 2007, Team 2526: Crimson Robotics from Maple Grove, Minnesota, started our rookie season with two mentors and ten students. We have now grown into a community of 18 mentors and 64 students. Five years ago, Crimson Robotics initiated our plan to spread the opportunities of robotics to every student, in every grade, in every school, in our district. Since 2015, we have shared the opportunities of robotics with all 24 schools in District 279. Since 2017, we have helped expand robotics across all 6 habitable continents. 2526 focuses on spreading robotics regardless of 1) socioeconomic status and 2) physical location. We have initiated 44 FIRST robotics teams that extend from our own community to around the globe. We are Team 2526: Crimson Robotics, and this is our story.

THE STORY OF TEAM 2526

Student captains lead each of our departments: Administration, Business, Engineering, and Outreach. Administration fosters a cohesive environment by overseeing our team's logistics and holding 2526 to the values of Gracious Professionalism and Cooperation. Administration Captain Lauren Kadlec says "Administration is the checks and balances of Team 2526; it allows students to be held accountable for themselves." Since 2017, Administration has managed Crimson GEARS (Girls in Engineering and Robotics). The GEARS program 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 34% female. This past winter, GEARS hosted a career panel with 30+ attendees ranging from 4th grade to college students.

Our business department finances and markets our team. Whether they're designing logos or cold calling a potential sponsor, students experience the business world in a FIRST environment. Every cent of this year's \$143,750 budget was student-raised through fundraising, sponsorships, and family contributions. Members are expected to contribute their own personal 100% towards Crimson Robotics through cold calling, fundraising, and sponsorships. Last year, our Krispy Kreme Doughnuts, Gertens Plants, and restaurant fundraisers netted \$47,449. Fundraising allows us to lower competition fees per student as well as fund outreach programs. We also provide financial aid for students whose families are unable to pay, and help fund local FIRST teams in need. Additionally, Team 2526 has worked towards ensuring the stability of FIRST by teaching all of our initiated teams how to apply for grants and sponsorships. We maintain relations with 18 sponsors through bi-monthly newsletters and social media. Our Art team rests within Business. By maintaining a style guide and designing merchandise, Art promotes our branding.

Team 2526 exercises all elements of the engineering process. We spend our summers introducing rookies to skills such as CAD and coding, involving them in our research. Rookies compete on one of our seven FTC teams, developing necessary engineering skills. We utilize free OnShape CAD software, so all students have access to the necessary tools. Team 2526 starts the FRC season by completing a cost-benefit analysis, rating manipulators based on their value. Students map out their final products by writing pseudo-code, building prototypes, and CADing mechanisms. Students design and 3D print our parts, select the drive team, and complete robot assembly. Engineering on Crimson Robotics aims to go further than just our robot. In 2019 we started collaborating with Enabling the Future to create 3D-printed prosthetics for the community. This process allows us to intertwine both Gracious Professionalism and engineering for those in need.

Our Skill Duck system is a new training curriculum to ensure FIRST's sustainability. From CADing basics to Cold Calling, Skill Ducks allows anyone to learn at their own pace. In case a rookie is unsure of what they want to pursue, Skill Ducks allows them to find their role within FIRST Robotics. Additionally, we have posted these Skill Ducks documents on our website to be used globally. Skill Ducks allows aspiring FRC and rookie teams to gain experience from a standardized curriculum, embracing all opportunities of robotics.

BREAKING DOWN SOCIOECONOMIC BARRIERS

As the fourth largest district in Minnesota, District 279 is socioeconomically diverse. Recognizing this, Team 2526 created a five-year plan in 2015 to provide robotics to every student, in every grade, in every school, in our district. We first sought to bring robotics to all of the three high schools in ISD 279. After ensuring the stability of Osseo Senior High's VEX Robotics program, we worked with Park Center Senior High to help restart FRC Team 3291, The Au Pirates. We provided them with mentorship to reestablish their team. Providing robotics to all four middle schools in our district, we initiated after-school FLL teams for the students. In order to ensure the sustainability of these programs, our members mentored teams across schools in our district.

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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. In 2017, 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 FLL, FLL Jr., and FTC event. With 127 FIRST teams competing, the event spread robotics tournaments to our community where they didn't exist in the first place. Over the past five years, Crimson Robotics has initiated a total of 44 FLL Jr., FLL, and FTC teams, 38 of which are integrated throughout our district. To reach all schools in our district, Crimson Robotics started a new initiative in 2018: Crimson Classroom. With our new program, Team 2526 provides students with the opportunity of engineering right in the classroom. We work with students to program WeDo 2.0 kits, build LEGO Mindstorm robots and drive FTC robots. Students learn about engineering and robotics through activity stations. Spreading FIRST through the state, 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 rookie Team 6974 Zia Robotics in New Mexico. We worked with Zia to share our cost-benefit analysis method, with one of us joining them during kickoff!

FIRST BEYOND OUR COMMUNITY

In an effort to spread STEM outside of the classroom, Team 2526 started our Girl Scout initiative in 2017. Recognizing a need to introduce girls of all ages to STEM, we worked with local Girl Scout troops to teach them about robotics. In 2018, we were commissioned by the Arbor Lakes Service Unit to create robotics badge curriculums for the five Girl Scout levels. This past season, we collaborated with the Girl Scouts River Valleys to host council-wide events, open up to 30,000 Girl Scouts of all ages. In May, our hosted events attracted Brownie and Junior Girl Scouts from around the Metro Area. This allowed us to spread FIRST and STEM to a wider audience.

In 2017, Team 2526 started a new initiative: Crimson Global. On an international scale, our team has created a plan to help spread STEM across every habitable continent by the year 2020. This winter, we have finally accomplished that goal. Through connections our team has made with Team 3132 Thunder Down Under, from Australia, Crimson Robotics got involved with FIRST Global in 2017. We mentored the FIRST Global team from Bosnia and Herzegovina while Skyping the FIRST Global students during weekly 5:00 am meetings. Bakir Kapetanovi?, a Bosnian student remarked, "This is not just a competition. For us, this is a gateway into the world." In 2017, we worked with Parkwood Primary School in South Africa to provide students with the opportunities of robotics. Collaborating with staff at the school, we initiated and funded a LEGO Robotics program. In 2018, we started an FLL Jr. program in Punggol Meadows, Singapore. This year, the program has grown to six teams. This past season, we reached out to FRC Team 1156, Under Control from Brazil, and FLL Team Migbotics, from Uruguay, to create a trilingual FLL curriculum for all of the Americas. We have written the guide in English, Spanish and Portuguese. The guide has been publicly released and sent within our respective communities to 37 schools this season. This curriculum covers the costs, registration, and the competition process of the FLL experience. After the success of the previous guide, we collaborated with 1156 to write a trilingual FTC curriculum. Following the same process, this guide reaches communities with little FTC experience, concentrated in South America. We hope the multilingual curriculum will allow a wider range of communities to take part in FIRST Robotics. 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 are collaborating to write a joint badge curriculum to spread FIRST robotics to scouting groups.

Crimson Robotics is constantly driven to spread the values of FIRST, regardless of 1) socioeconomic diversity and 2) physical location. In the last five years, Team 2526 has spread the opportunities of robotics throughout our school, district, state, nation, and globe. We are never afraid to take on challenges, find ways to provide the opportunities of robotics, and spread the values of FIRST through each of our actions. Over the next five years, Crimson Robotics strives to involve FRC teams across our world and nation in the Skills Ducks program. We are Team 2526: Crimson Robotics and our story has just begun.