

Chairman's Award - Team 503

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2020 - Team 503

Team Number

503

Team Name, Corporate/University Sponsors

Magna Seating Systems (Primary Sponsor) / Denso / The Nissan Foundation / Tata Technologies / Ford Motor Company / Novi Community School District / NGK Sparkplugs / ASCO Numatics Inc. / Autodesk / Michigan Department of Education & Novi High School

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

On 503, our team members discover how their interests become a career path and gain confidence to achieve their goals. They develop technical, leadership, communication and teamwork skills that transfer beyond robotics. FIRST opens doors to scholarships, internships and a career network. Our alumni volunteer at events and mentor teams during college and beyond. FIRST inspires our team members to share their passion for STEM by breaking down barriers for others in underserved communities.

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

We've shared FIRST at 34 community events this year. We've included our library, elementary schools, Girl Scouts, summer lunch program, and afterschool CARE to offer STEM activities for students, reaching 1200+ this year alone. We participated in the Advanced Manufacturing Expo to show FIRST to over 200 exhibitors and attended Brickworld, reaching 1000s of LEGO enthusiasts. To give every student the opportunity to participate in FIRST, we implemented registration through the school district.

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

Our annual townhall meeting, team training and embedded mentor models create a pipeline where students progress through FIRST and mentor younger teams along the way. We've taught other teams how to implement this model by including them in our townhall and sharing our resources. We work with 2 separate Detroit community centers to form a sustainable pipeline of FIRST programs for underserved youth. We partnered with the Detroit Police Athletic League to scale that model to 29 Detroit schools.

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

We run 5 FIRST events annually and have taught other teams how to run a competition by sharing our experience and key volunteers. This fall, Frog Force Frenzy hosted 36 FTC and 7 FLL Jr. teams. We host a Detroit FTC Kickoff and Detroit FTC Qualifier to give teams the opportunity to compete locally and increase awareness of FIRST in the city. In it's 19th year, our FRC Kickoff has reinvented the way teams around the world receive their kit of parts.

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

We started FRC teams 3547 and 4840 in southeast Michigan. We also shared our mentors and buildspace with 6 local teams to ensure that they had a strong foundation in their early years. We provided the FIRST expertise needed to start the robotics program at the Robotics & Engineering Center of Detroit (RECD) and mentored the first 2 teams. The RECD is now a self-sustaining, successful robotics program housing 10 FRC, 3 FTC, 2 FLL and 2 FLL Jr teams. This year we started a new FRC team, 8426.

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

We've started 99 FIRST teams in 3 years. We introduce new families to FIRST via our townhall-style meeting, resulting in 45 new or repopulated teams in Novi over the last 3 years. Sharing our experience, we reached beyond our borders, to partner with Detroit PAL and start 22 FLL and 22 FTC teams to date in Detroit schools. In 2018 and 2019 we started an additional 10 teams within Detroit Public Schools by sharing FIRST, registering the teams and sourcing grant funding.

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

We've held 60 workshops, camps and training events in the past 3 years, committing 3,475 hours to help teams. We run FTC Kickoff and FTC girls camp annually. For Detroit PAL teams, we run a workshop every 3 weeks to help them for their competition. We've spread across the globe, holding a competition for 11 FLL teams and workshop for 5 FTC teams in China. We created The Motor City Alliance, which ran 2 much-needed scrimmages for Detroit teams, and The Orange Alliance website for all FTC teams.

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)

Our embedded mentors spend hundreds of hours every season with our Novi FIRST teams. We travel every week to mentor our teams at SAY Detroit Play and our newest FTC team at Keidan Special Ed Center. More importantly, we teach other teams the importance of mentoring. The RECD teams we mentored are now mentoring new teams at the center. Our Novi FTC teams mentor Novi FLL teams and Detroit FTC teams. We've created a culture that ensures sustainability across all levels in multiple communities.

Describe your Corporate/University Sponsors

Our founding sponsor, Magna, has supported us for 20 years by providing facilities, mentors, printing, and the majority of our funding. Recently, we've reached out to our community, diversifying our sponsor base to include 12 automotive and technology companies. They provide monetary and in-kind donations such as equipment, software, and internship opportunities. Novi Schools provides meeting, machining, assembly and practice space to support the growth of FIRST in our community.

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

We engage our sponsors in a collaborative partnership through regular visits and monthly newsletter updates. We gain mentors for our team and valuable real-world professional feedback from an industry standpoint. As their flagship team, Magna invited us to their FIRST@Magna day and to star in a promotional video highlighting their support for FIRST. This year, our team conducted product testing for Autodesk and Magna. These partnerships lead to scholarships, internships and future careers!

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

FIRST is more than building robots -- it is a tool for breaking down barriers. It helps students discover their passions, achieve their goals, and inspire others. It brings together students of all backgrounds and challenges them to work towards a common goal. It provides alternative, hands-on methods to explore STEM and motivates us to give back to something bigger than ourselves. FIRST is inspiring the future generation of scientists, engineers and leaders who will change the world.

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

From the start, we've been trailblazers. We invented the FIRST local Kickoff. Now with 140+ Kickoffs on 5 continents, we changed the way teams around the world experience FIRST. Our "FIRST Pitch" baseball robot idea has been copied around the country as a way to "make it loud" by reaching tens of millions of people who wouldn't have experienced FIRST otherwise. We also teamed up with the Detroit Tigers sharing FIRST and the math behind it with 2600+ students at their Class Outside Math Day.

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

We paved the way for more students to participate in FTC in MI. During the critical time when FTC was growing, we provided key volunteers at every competition, every weekend. When FTC switched to the Android platform, we held 5 workshops across the state and became the FIM "helpdesk" for FTC. In 2016, we won the Positive component of the MI Governor's Relentless Positive Action Award for growth in the state. In 2018, we won the Action component for our efforts to grow FIRST teams in Detroit.

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

Vandan Shah

Essay

OUR VISION

We believe FIRST is a program without boundaries. From our own neighborhood to inner-city Detroit, from the Australian outback to rural China, our goal is to provide every student, no matter the challenges they face, the opportunity to be a part of FIRST.

OUR TEAM

Coming from 14 countries and speaking 14 languages, we share diverse perspectives and ideas. Working collaboratively, our design process based on Quality Function Deployment includes every team member's voice in the robot design. 10 student-led subgroups create 6-week training programs where members gain self-confidence and skills such as CAD, programming and budgeting, allowing each student to be a productive part of the build season. This year, we added a RoboCamp with sessions on team history, prototyping, and marketing.

Our sponsors are an integral part of our team, providing funds, mentorship, fabrication and industry expertise. Working alongside them gives us the benefit of their experience and advice. In turn, we assist with product testing, volunteer at sponsor events, hold an annual open house and recognize sponsors at the school board. These partnerships lead to internships, scholarships and careers.

IMPACTING OUR SCHOOL

Last year, we implemented FIRST registration through the school district. As a result, joining a team is now accessible to every student. FIRST is also publicized through community ed and over the district listserv, reaching every family. Our signature townhall meeting draws 175+ people annually. We've started teams in every school in our district at every level by introducing families to FIRST, registering teams, ordering equipment and applying for grants. In Novi Schools, there are now 44 FIRST teams: a 29% increase over last year! We provide sponsorship, student mentors, coach training, programming classes and workshops for our teams and we added an FLL Kickoff this year. Most exciting, the recently-passed district bond includes funds to create a K-12 robotics center.

Our school district was inspired by our FIRST teams to create a high school class, "The Incubator," where students develop products in partnership with local companies to address real world problems and gain life skills. Modeling FIRST, this year the Incubator students have started and are mentoring a similar class in a neighboring district spreading the values of innovation and cooperation.

We pushed for the first programming classes in our school and now it's spread across the district. This year we are teaching kindergartners to design in CAD and 3D-print a model of their school. 743 people attended a STEM Night we created where we invited 19 organizations from universities, science centers and businesses. Due to the impact a team member had at this event, she was asked to participate in a districtwide STEM Equity Panel.

INCLUDING OUR COMMUNITY

We include our community in our FIRST experience by sharing our robot at 25+ community events annually. We introduced STEM Days at a summer lunch program, leading activities for 170+ students and introducing them to FIRST. This year, we implemented the idea at an afterschool CARE program.

We constructed 200 3D-printed prosthetic arms for the non-profit e-NABLE in partnership with our library and school district, showing 400 4th graders that they can make an impact at any age. This year, FOX2 News "Made it Loud" by featuring FIRST and our e-NABLE project on their TV broadcast.

Our shield is recognized all around town. More than just a robotics team, we give back to the community that supports us by regularly volunteering for Relay For Life, community restoration, and local fundraisers.

BREAKING DOWN BARRIERS

All students should have the opportunity to be STEM leaders. In summer, we run a 5-day STEM workshop--by girls, for girls--to teach how to build, wire and code an FTC robot for a game we create. We also designed a Girl Scouts workshop where 3 levels of scouts earn their robotics badges. We compete at an all-girls competition to create another way for girls on our team to explore build, programming and driving roles.

We work to remove barriers for students who may need extra accommodations. This year we started an FTC team at a special education school where the students face various verbal, cognitive and physical challenges. We organize group activities to introduce the students to cooperation and teamwork. They practice technical concepts like gear ratios and soft skills like presenting their ideas. We were surprised when a student told us that his robotics knowledge helped him fix the dishwasher at home! We continue to mentor the team weekly as they prepare for their spring competition.

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We've found a unique way to share FIRST via e-NABLE. We are the first FRC team to form a chapter to design, fabricate and fit custom prosthetic hands for the non-profit. This summer we attended the Lucky Fin hand camp which celebrates and supports those with hand differences. We fitted 16 right arms and took special orders. After seeing 3 year old Emersyn's joyful reaction to our prosthetics, we made a custom left hand for her.

EXPANDING BOUNDARIES

Building on success in our own neighborhood, we've expanded our boundaries to give at-risk students in Detroit the FIRST experience. We were invited by FIM to develop the Robotics and Engineering Center of Detroit (RECD) at a community center in Mexicantown. During the first season of RECD, we mentored 2 teams 30-40 hours/week. The center now supports 10 competitive teams, paving a pathway for members to gain life skills, scholarships, internships and STEM careers. RECD was the beginning of the exponential growth of FIRST in Detroit.

If equity is the opportunity to participate, inclusion is meeting students where they are to make it possible. Using our community center model, we introduced FIRST to SAY Detroit Play, an afterschool center where kids receive tutoring and participate in extracurriculars. We started 5 FIRST teams in an underserved neighborhood where STEM role models aren't as common and brought \$100,000 in grants to the center to fund the program. We provided coach training, open houses and summer camps by transforming a workout room to a build space. We purposely started younger teams to introduce FIRST at an early age and create a progression of programs in Detroit. Mentoring weekly, we have a personal relationship with the kids. We see the excitement when an idea works and share their triumph at competition!

We know that it takes a dedicated effort to create opportunity and inclusion. In 2017, we pushed the boundaries by partnering with the Detroit Police Athletic League to include robotics in their sports program, starting 22 FLL and 22 FTC teams across 32 Detroit Schools to date. We met with Quicken Loans to provide funds and mentors for the teams. We break down barriers by training coaches, building fields, hosting kickoff, and running local competitions. During their season, we are onsite every 3 weeks to lead workshops and provide guidance. We coordinate with Detroit Public Schools (DPS) to provide teachers with professional development and teams with transportation to competitions.

We see a change in culture as FIRST takes hold in DPS. Teachers are starting new teams, meeting in the off-season, using advanced techniques and sharing their success on social media. To support this growth, we created the Motor City Alliance, inviting FRC teams to join our mission to give every student in Detroit the chance to be part of FIRST.

CROSSING THE GLOBE

FIRST is a universal language. Our experience locally and in Detroit applies halfway across the globe. In 2017, we were invited by FIRST to travel to China as a part of the Sino-US United Project to build new connections with FIRST teams in China. We mentored a pre-rookie FRC team that went on to win the FIRST China International Competition. This trip would become the first step in our journey to include students around the world in FIRST.

An unexpected benefit of mentoring in China was the chance to network with other FIRST teams that share our vision of reaching students in underserved areas. FRC 3132 invited us to participate in the Mentors Without Borders (MWB) conference in Sydney, Australia. The purpose of MWB is to provide remote rural communities with access to the experience and resources of veteran teams. We were excited to be part of a program that so closely mirrors our mission; to provide all students access to FIRST. We presented 3 seminars for the MWB teams: game analysis, awards, and team sustainability.

Building on this effort to expand FIRST without boundaries, we are a founding member and in the leadership group of The Compass Alliance (TCA), a coalition of world-class teams who share the mission of sustaining teams everywhere. By creating resources for FIRST and TCA's websites, matching new teams with experienced mentors, and staffing a 24/7 hotline, we give the necessary support for all teams to be successful.

In 2019, FIRST Australia was looking for a team with FTC expertise to introduce the program to underserved communities in rural China. We created and ran a 3-day workshop to build and program a robot, then compete in a modified version of the game. On the same trip, we helped run a local FLL tournament by filling a majority of the critical roles. The FTC workshop was such a success that administrators are anxious for teams at their schools. We are returning to Fujian province in July to run a weeklong FTC summer camp and competition.

MAKING AN IMPACT

Woodie Flowers inspired us to tear down barriers to continue his legacy of Gracious Professionalism through inclusion and diversity. We spread the message of FIRST in our school and community. We reach out to underserved populations. Although we speak different languages, live in different communities and learn differently, we can build a global network to give every student the opportunity to participate in FIRST.