

Chairman's Award - Team 503

[Print](#)[Close](#)

2021 - Team 503

Team Number

503

Team Nickname

Frog Force

Team Location

Novi, Michigan - 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.

Our team members develop real-world skills through group training and work with mentors to explore career interests. All of our members graduate and attend college, with 92% pursuing STEM careers. 503 opens doors to scholarships, internships, and a career network. Each year, about 90% of our graduates are offered scholarships to attend college. Last summer, 6 team members were recruited by a local vehicle electrification company looking for FIRST-specific skills and leadership experience.

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

We consider our community to be greater Detroit. There are a lot of FIRST teams in the area but there are pockets without teams where we have the opportunity to make an impact. We've taken the time to understand the challenges that make it harder to start and sustain teams in underserved communities: a lack of mentors, transportation, technology or food security. We find community partners including sponsors to lower those barriers while we provide the FIRST knowledge to build the programs.

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?

We effectively transformed our K-12 registration process making it easy for families to join FIRST, measured by 26 new teams in Novi since implementation. We partnered with Detroit PAL to start FIRST teams in Detroit schools because the model is scalable to all Detroit schools, growing from 20 teams the first year to 54 teams in 41 schools this season. We measure success by the sustainability of the teams we start. Even during COVID, 84% of teams we started in the last 3 years are still around.

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

Our team members act as role models by sharing our expertise. Following the example of her mentor, Ashna teaches build skills during girls FTC camp and mentors the girls on their FTC team. On The Compass Alliance, Sydney writes official FIRST resources for FRC team sustainability. Josh presented advanced programming concepts during 24 Hours of STEM to take FRC teams to the next level. Because of their experience, Ankith & Megan were asked to create and run an FTC workshop for FIRST Australia.

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

We've started 75 teams in the last 3 years across Novi and Detroit by introducing FIRST programs, registering teams and sourcing grant funding. We mentor our Novi teams and teach our FLL and FTC teams to mentor other teams. In Detroit, we mentor 2 teams at SAY Play and a special education team. We assist our teams with summer training, kickoff events and in-season workshops taking all events virtual for 2020. This year, we are mentoring the 5 FTC teams from our workshop last year in China.

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?

We organize district-wide STEM nights for over 1,000 people. We partner with our local summer lunch program for weekly STEM workshops. We've taught 3D printing in our elementary schools, resulting in a kindergarten classroom project to model their school. This year we taught TinkerCad and Scratch classes for 25 4th graders, creating an interest in coding. Our Superintendent was inspired by our team and decided to start an entrepreneurship class that uses FIRST style project-based learning.

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 most impactful partnership is with Detroit PAL and the 44 teams we started together. We created a non-profit, The Motor City Alliance, with Detroit FIRST teams to make the program sustainable. We provide weekly workshops, resources and a collaborative network. We worked with FIRST teams on 5 continents to produce 24 hours of STEM content streamed around the world--twice. We partnered with our school district, sponsors, and community members to create and distribute 4400+ pieces of PPE.

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

We focus our efforts on bringing FIRST to underrepresented populations. We hold an all-girls FTC camp and Girl Scout robotics badge workshop. We received the FIRST Equity and Access Grant to bring events to Detroit, lowering barriers so students can compete in their community. In 2020, we started a Special Olympics Unified Robotics league in MI, including students at all learning abilities. We ensure that every team member takes the FIRST ED&I Youth Training by including it in our team meetings.

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

Our progression of programs continuously populates our team with experienced members and mentors. We develop the next generation of leaders through team training, and by providing opportunities to lead events, be group leads and be team officers. We don't just aim to start initiatives, we work to make them sustainable. We teach the participants the skills needed and involve them in project leadership. Then, we form partnerships with other FIRST teams or community groups so our programs grow.

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

Our sponsors are our partners. When recruiting, we opt for a face-to-face presentation because talking to our students better showcases FIRST and encourages support for the next generation of STEM leaders. This year, we created a podcast to introduce students to our sponsors and what opportunities their company has to offer. We've done product safety testing for Magna and software testing for Autodesk. We invite our sponsors to an open house and a sponsor recognition night with the school board.

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

Our biggest challenge is sustaining student participation during the build season when too many members struggle to find a way to stay engaged. To improve participation, we hold group training so students have the skills to contribute, and are growing a second team to give more students hands-on robot experience. To encourage involvement, we support students in creating and leading events they're passionate about. Our student leaders plan team icebreakers and social events for students to bond.

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

Our goal is to create sustainable FIRST programs and make them big through community partnerships. With Detroit PAL, we jump started a thriving robotics community, changing the culture in Detroit schools to embrace and support robotics. We've been partnering with FIRST Australia to start a brand new FTC program in a rural province in China. To create a sustainable FIRST ecosystem for all FRC teams, we helped found The Compass Alliance, which provides resources and support to ensure team success.

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.

FIRST enables students to take the skills they learn and do big things! One member was recognized by Forbes 8 Under 18 for leading efforts to 3D print 3380 face shields for frontline workers. Another created a STEM night for 1000 people involving 19 STEM organizations. Team members presented how math is used in robotics to 2600 attendees on the JumboTron at Detroit Tigers Math Day. A Frog Force student organized the team to leverage our computers and utilize their power to aid in COVID research.

Essay

Remember when we thought the biggest change for 2020 was no bag day? This has been a year of challenges but FRC 503 students are uniquely prepared to innovate and adapt. FIRST provides the tools we need to change the world around us.

FIRST IS A TOOL TO ADAPT

When we were forced to take everything virtual this year, we maintained our normal activities without missing a beat. We converted team meetings and training to a virtual setting, and even learned to create livestreams for our community townhall and FLL & FTC Kickoff. It's hard to keep everybody engaged in virtual meetings after online school or work all day, so students created fun weekly quizzes and social activities to keep everyone fresh.

We're proud that in a year where it was difficult to reach out face-to-face, we stayed engaged with our community. Usually we do over 100 events, and despite the obstacles this year we still managed over 90. We modified in-person outreach events or created new ones to be done safely. We took a preschool robot "show and tell" outside to the playground and used student "pods" to bring socially distanced STEM activities to summer camp.

This fall, FIRST in Michigan (FiM) was also navigating virtual events. In any other year, we run 5 FIRST events and as early adapters to run virtual kickoff events, we were able to provide FiM with tips for this season. Our suggestions were included for FRC modified in-person events. We helped FiM develop an FTC judging schedule for remote events and shared our experience judging virtual events. Seeing our Novi FLL scrimmage in action showed how breakout rooms could be used as "virtual pits".

This year has been difficult on our sponsors too. We knew it was important to strengthen our relationship and let them know we are still making a difference on and off the field. We tested Autodesk updates to their Fusion 360 software to run on Chromebooks, so they could add a competitive product for school districts. This also allowed us to introduce CAD to the teams we work with in Detroit.

Adapting virtually meant more than just modifying outreach events. Our robot is the vehicle we use to inspire, so we didn't just stop when we couldn't get in the shop. We sent the robot, or separate mechanisms, home with students to work on, using web meetings and cameras to collaborate. Our programmers also created a simulator to test code on a virtual robot until they could test in person.

FIRST IS A TOOL TO INSPIRE

As the virtual school year ended, it was time to register students for fall FIRST programs. Although a lot was unknown, we knew it was more important than ever for students to continue being FIRST game changers. We brought our information meeting to families via YouTube and partnered with Community Ed so they could easily register for a FIRST team online. We have 35 FIRST teams in our district, and even in this virtual year we retained 80% of our teams compared to 55% in the rest of MI. This is because, with 745 hours of mentoring and training, teams are confident we will provide them with the resources to be successful.

Going virtual actually allowed us to increase the number of students we can reach. This summer we created an FLL Task Force to provide training and serve as a helpdesk for any FLL team. We grew our introductory FRC Java classes to include FTC teams. We also moved our FTC programming classes and new FLL programming classes to a remote platform, demonstrating how teams could meet virtually. Unable to meet in person with our team at Keidan Special Education Center, we created STEM "Learning Boxes" so each student could work hands-on to build an FTC chassis at home.

It's been a hard year for students and teachers alike so we looked for ways to add something fun. After our project to 3D print prosthetics in all the 4th grade classrooms, a Kindergarten teacher asked us to introduce CAD and 3D printing to her class. We also created a series of virtual Scratch and TinkerCAD classes for 4th graders to explore new STEM skills.

On our own team, we wanted to inspire girls to try one of the build groups so we created a 5 part robot-centric "Women in STEM Training" covering strategy, robot design, CAD, machinery and driving for the girls on the team. One of the girls on our team used her FIRST programming skills to develop a Chrome extension, Eye Watch, that helps with eye strain by giving regular reminders to look away from the screen and rest your eyes.

FIRST IS A TOOL TO BUILD ALLIANCES

Essay - page 2

We can do big things when we bring together diverse teams. We partnered with teams from around the world to co-run 24 straight hours of STEM-related presentations on two livestreams. As part of this international alliance we devoted 200+ hours to organize the online event, recruit and schedule presenters, and train host teams. Based on our experience with virtual events, we developed the online structure and streaming guides for the hosts to use. This event was such a success that our alliance organized a second, this time with up to 4 simultaneous streams and even more content. In total, our team was on-air 11 hours, created 7 presentations, and oversaw 36 hours of livestream.

After starting a handful of teams in community centers, we looked for a partner to bring FIRST to more students. We approached Detroit PAL to include FIRST robotics in their sports program and reached out to Quicken Loans to fund the partnership. This alliance created 44 FIRST teams and jump started future growth of teams in the city. To have a sustainable robotics program in Detroit, we need to grow a community where teams support and learn from each other. We created the Motor City Alliance (MCA) as a platform for that collaboration and invited Detroit teams to join us. This year, MCA has grown to include community partners Wayne State University and Amazon. We knew the season would be challenging for teams so we held preseason training and an FTC kickoff with 9 workshops over 3 livestreams. We developed a helpdesk for quick questions, a robot shop so teams can get emergency parts quickly and office hours for teams to drop in and get help whenever needed. Knowing the teams need a little extra time, we'll run the Detroit FTC Qualifier in May to celebrate their hard won success.

FIRST IS A TOOL TO CHANGE CULTURE

Change is slow. Real change is hard work. Although we've worked for several years and put in the "hard yards" to bring robotics to students in Detroit, we're now seeing the change, and working with Detroit PAL was the tipping point. Starting so many teams and seeing their success attracted the Detroit Public School district's attention and they appointed a new STEM director to support robotics. We work directly with him to start teams and support coaches, which is a huge change. Now we have a partner inside the district who is as excited about FIRST as we are. In the last 2 years we started 18 FLL and FTC teams, including 8 new teams this year. The impact can be seen even during COVID, when the district has allocated resources for coach training and purchased practice fields as hubs around the city. The district has prioritized robotics because they see the impact on students and don't want to lose momentum even during a pandemic. It has been a challenge to support the teams during virtual learning but in addition to leading the MCA events, we join monthly coach meetings and chat or meet with teams over the district's Teams site to provide training and answer questions. Even in these crazy times, we're finding a way to work together for an awesome season!

Urban USA and rural China couldn't be further apart, but the challenges are similar. FIRST Australia took note of our success in Detroit and looked to us to start FTC in a similar underserved area. We created a curriculum and translated documents to run a workshop--in Mandarin--along with running an FLL tournament. Our plans to return to China this year were cancelled so we are using WeChat to mentor the teams this season. We remain an active partner in the Fujian Province FTC program and until we can return, are volunteering remotely at their upcoming events.

FIRST IS A TOOL TO BUILD COMMUNITY

When the 2020 season abruptly ended, we turned to our 3D printers to answer the desperate plea for PPE from our neighbors on the front lines of the pandemic. With the help of doctors in our neighborhood, we researched and tested several designs, making modifications to meet their exact needs. We formed an alliance with FIRST teams, our sponsors, and community members to provide a way for people to give back and find purpose in the early days of the crisis. After hearing on local media outlets how we hopped on the opportunity to shield our community, our school district sent 3D printers home with students so we could create 1,000 face shields for all district employees.

Our Frog Force shield is well known in Novi. This year the parades, maker faires and STEM nights were all canceled. So we leaned into helping our hurting community with over 4,450 hours of community service. Instead of holding weekly STEM workshops at a summer lunch program, we packed bag lunches and created 600 STEM-at-Home kits for students. We held fundraisers and food drives, volunteered at area food banks and provided PPE for volunteers at Forgotten Harvest. We reached out to seniors with cards of encouragement, collected care packages for homeless children and became virtual storytellers for families without access to books. We learned how to harness our collective computing power to fold proteins for Covid research. We found a way--where there was no way--to stay connected and inspire learning.

This year brought many new challenges, and amplified old ones. We stepped up to the challenges and used the tools we have as FIRST team members to heal our community, inspire students to learn new STEM skills, create new alliances and promote cultural change. FIRST gives us the tools to be Game Changers.