

Chairman's Award - Team 3655

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2022 - Team 3655

Team Number

3655

Team Nickname

Tractor Technicians

Team Location

Mason, 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.

In the past three years, every member of our program has graduated high school and a large majority of those members chose to continue their education through college. Our program allows members to experience a real world application of STEM so naturally most of our members go into STEM majors and/or careers. Through our FIRST program we have created connections and unique opportunities for students that help them in their college and career choice.

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

Mason is a rural community, providing us the unique opportunity to spread FIRST values in an area with limited opportunities for students to participate in STEM programs. Our main focus is to build STEM literacy from kindergarten to high school. We have the privilege of utilizing fantastic equipment in a recently-updated workspace which assists us in encouraging young students to be involved later in life, and providing older students with a strong foundation in fields from STEM to business.

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?

With recent efforts devoted to a Level Up Summer Robotics Programming camp, 3-D printing class, and both introductory and competitive levels of robotics classes, we have expanded STEM opportunities outside of the traditional extracurricular realm and into the classroom environment. Not only have we measured results in our increasing number of participants in robotics; we have also observed an increase in general STEM literacy among students that participate.

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 3655 embodies productive, insightful leadership. Our students work with local teams like 6591 and 8374 to provide field practice and robot fabrication assistance-and, of course, to build strong interpersonal connections. We have also hosted several events over the past three years: local build days in 2019, 2020, and by appointment 2021; Mason Districts in 2019 and 2022; a virtual kickoff for 2022; finally, we have hosted 4 FTC events as well as a 2021 LEGO elementary state competition.

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

For the past seven years, our team has hosted the only district event in Mid-Michigan. We invite local admin and teachers to spark interest as well as engagement. Spreading the message of FIRST this way has started 17 new FIRST teams in Mid-Michigan over the past five years, including an additional FRC team for advanced FTC students to prepare them for the next level, all of which we continue to assist and mentor alongside the pre-existing teams we were helping.

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?

Mason Public Schools cooperated with our team to create an engaging STEM and Robotics curriculum for K-8th grade. Level Up Summer Programming involved past and current members of our team structuring the lego curriculum and STEM based projects, as well as assisting with the rest of the program. The impact was a large increase of younger members excited to be in robotics. Our FTC teams went from 10 members to over 50 members and our elementary teams expanded from 23 teams to over 30 teams.

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

A partnership with Mason Public Schools allowed us to convert an old school gym to a lab and fully-functioning machine shop and support their new summer programming. Additionally, sponsorships and grants assisted us in the purchase of new machines, equipment, and tools. Our team partners with robotics teams in the Mid-Michigan Robotics Coalition, focusing on building a sustainable base for robotics in Mid-Michigan. This combat struggles for newer teams and supports all teams in Mid-Michigan.

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

Despite Mason having a small proportion of students of color, we pride ourselves on being an inclusive space for all people. Our team has proudly taken the same stance as FIRST Robotics by celebrating pride month and supporting Black Lives Matter. Our culture and communications team cultivates discussions about making sure the culture on our team stays equitable and conscious of these culturally sensitive topics, like implicit bias within programming. Especially when interacting with teams.

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

Though COVID-19 has negatively affected abilities to communicate FIRST opportunities and maintain long-term membership among members, our team continues to uphold sustainability. Mentoring Next Gen and FTC teams ensures that newer members establish strong foundational skills, while the presence of leadership positions pushes older members to maintain responsibilities. This "teach as we go" model allows our robotics program to perpetuate success as knowledge and skill is reused and recycled.

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

Among a variety of sponsors we keep engaged with video and emailed updates on our progress and the impact of their fiscal contribution, one of our most significant sponsors, a Japanese software development company Kudan has allowed for us to pay the registration fees for our entire program. Stateside sponsors are regularly invited to our facilities for tours and demonstrations. Team members enjoy visiting our sponsors' facilities and the priority is to develop a relationship with all sponsors.

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

Our team actively works to improve all areas because we realize that perfection is impossible. One area we choose to highlight is engagement. COVID-19 has taken a toll on our engagement, but the team has been working on this issue for a while. To counter this, we have stressed the importance of engaging members on a personal level to leaders and mentors. This has been a more effective strategy and improves our retention of past members, recruitment of new members, and engagement of current ones.

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

Our team defines success differently. Success is not just about winning competitions or awards, but how we impact our membership. Our goal is to expose as many people as possible to our program as we build them in all areas like leadership skills, knowledge of STEM, and the message of FIRST. Our team is proud of the individuals that we have fostered into the well-rounded adults. Increasing the team's membership allows us to continue to make progress towards our main goal of bettering people.

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.

A significant initiative on our team is the expansion and increasing accessibility of 3-D printing. Our high school 3-D

printing class allows students to learn the tenets of onshape in a supportive, knowledgeable environment. The team also has a large number of 3-D printers available; this makes prototyping easier, creating parts faster, and we can dedicate more time to an imaginative design. We extend our 3-D printers to all of our community and consistently create designs for these projects.

Essay

Our journey is proof that robotics can change a school, community and individuals for the better. The Tractor Technicians have shown consistent growth in size every year since its formation 12 years ago. As we enter our 12th year competing in FIRST Robotics, we take this time to reflect on the values of FIRST and how those values fuel the sustainability of our team. We are sowing skills, growing leaders, and harvesting futures.

Our team's sustainability starts with our leadership structure. The leadership team consists of students who have shown outstanding leadership and expertise in their subdivision. These students work with our mentors to elevate each other and the program. Each student leader mentors other students in their respective areas following our "teach as we go" method to communicate the information and knowledge essential to the subdivisions without inhibiting progress during the robotics season. Our subdivisions like fabrication, programming, and culture and communications have remained strong throughout the years because of this strategy. Existing students are not overwhelmed by new members because the teaching is intertwined with the development of the team and the subdivision's goals. This structure helps to advance the culture of our team, and long-term sustainability for our teams.

The FTC program allows us to expose middle school members to more basic concepts and furthers our sustainability model. Students are introduced to new STEM concepts and team culture by FRC team members, who are the main mentors for the teams. Student mentors educate our 6 teams of 6th-8th graders in basic Block and Java programming, simple designs in CAD, building, tool safety, and FIRST's core values. By engaging younger students, we are building skills that will prepare them for the next level of competition.

This framework of building skills in middle school allows us to have a second FRC team. Tractor Technicians Next Gen is made up of advanced 7th and 8th grade FTC students. These advanced students have the opportunity to participate in 3 full years of FTC and 5 to 6 full years of FRC. The valuable time in both FTC and FRC level of competition prepares students and contributes to the growth of our members.

In 2020 we expanded, adding 2 FLL and 5 Jr. FLL teams to the 8 FLL and seven Jr. FLL teams we had already. This season we expanded even further to have over 30 FLL and Jr. FLL teams combined. Hands-on learning experiences at all Mason elementary schools are fun while creating interest in robotics. More advanced learning at the Middle School fostered an interest in continuing at Mason High School. By encouraging discovery and leading to innovation, we have ensured a strong population of upcoming students with interest in doing robotics. We have fostered an environment conducive of confidence in one's self and creativity. Programming at the elementary level has been incorporated inside the classroom during a resource accessibility time for students that do not need those resources.

We cooperated with Mason Public Schools to incorporate FIRST Robotics values and programming into their summer curriculum. Past and current members of our team worked with these kids each day with the regular programming. As well as creating a unique STEM based project and Lego Robotics curriculum for K-8th grade. Robotics was a way to reintroduce concepts, like English and Math, that they had yet to master in a more captivating way. The impact was a large increase of younger members excited to be in robotics and new skills gained. Our FTC teams went from 10 members to over 50 members and our elementary teams expanded from 23 teams to over 30 teams.

Being one of the oldest teams in Mid-Michigan, we helped to found the Mid-Michigan Robotics Coalition. Along with 9 other teams, we partnered to help build a sustainable base for robotics in Mid-Michigan. We knew that young teams often struggle in their first few years. To combat that, the MMRC provides aid as requested. Since 2018, the MMRC has mentored 18 rookie teams and continues to specifically support these teams.

In 2014 we hosted our first ever district FRC event. Ever since that opportunity we have expanded the events we host to include FLL, FLL jr., and FTC. The impact of hosting competitions is demonstrated by the level of support we see from the FIRST community. We enjoy hosting and recognize the importance in creating opportunities for students.

Our persistence with robotics allowed members' to learn new ideas, gain knowledge and improve mechanical skills. The first year's experience not only inspired us to expand STEM opportunities in our community, but to establish it into our school's and community's culture. Technology is now a key aspect of Mason schools providing innovative ways for students to learn through our various classes offered. We have classes specifically designed by our robotics team for introductory and competitive levels of robotics as well as 3-D Printing classes.

During the 2019 season, we worked with our school district to build a new state-of-the-art robotics center. It was not intended to be used just for FRC, but for all levels of robotics programs and FIRST community use. We hosted small FTC scrimmages at the center and set up FLL practice fields for Mason teams, and we hosted other area teams for drive time on a real field.

The Robotics Center is the perfect setting to continue to grow future leaders in science and technology. The space itself provides students with ample workroom to innovate, create and maintain robotics. This year we are extensively using CAD and 3D printing to help not only identify problems before they occur in competition but also to create efficiencies that allow more time for the design process and drive training on a working robot. Team members are learning at a whole new level.

We recognized our ability to contribute more, and during the summer of 2019 we found a new purpose for an underused trailer that had sat in our school's parking lot for five years. We had the robotics center, which allowed teams to come to us, but we wanted to further increase our impact. Led by one of our team members, who was a local Boy Scout, the project collected resources and volunteers to turn an old trailer into a mobile robotics machine lab. This community collaboration helped us strengthen our visibility and reach in Mason and the FIRST community. The robotics student who led this project was able to demonstrate the leadership and skills he learned to the community and complete his Eagle Scout Service Project.

In the 2020 season, we provided the Mobile Machine Shop for use by all teams for the first time at the Jackson competition. Inside it, the necessary tools to build a robot from start to finish supported teams at the competition. Many teams utilized the shop and guidance from our lead fabrication members to assist in its usage. That season, we could travel to teams outside of competitions to help them create and develop their robots. The trailer is especially helpful in aiding teams who are unable to travel to our shop in Mason. This upcoming season the Mobile Machine Shop will be utilized for each week of the robotics competition season at events; impacting an extremely large number of teams. This promotes inclusion in the Mid-Michigan area, and allows us to have a greater impact within the FIRST community. In the future, we will use the trailer in hands-on demonstrations to continue to promote science and technology. We participate in outreach activities in our community whether that be going to a Rotary Club meeting to talk about robotics or the local Boy Scout Camporee to work with youth. Without a positive working relationship with our community, we would be unable to achieve our outreach goals.

Also important to our outreach goals are our partnerships with sponsors, which are key to our growth and continued sustainability. Without the support of the locally-owned small businesses in our community Mason Robotics would not have the resources we have to take our small-town team to the next level. This growth also allowed us to expand our sponsorships to non-local sponsors, even ones outside of our country. Though our small-town team values will always be a core part of our team, no matter how large we become. Mason, Michigan being a small town has that influence and further shapes how we interact with other teams and view FIRST Robotics, past just FIRST values.

We are also spreading the message of FIRST through our extensive connections with our local news and media outlets. We have been featured on many newscasts throughout the years. Some covering our grand opening of the robotics center, others our quick build at the high school. Footage of our district event ran on the 11:00 news, just like sports highlights. Our team had the same experience of watching live from a local restaurant that the high school football players do every Friday night in the fall. This truly shows how the robotics program is viewed as an important pillar of the community like our sports teams.

These opportunities are monumental for not only us but also for FIRST. We believe that organizations like FIRST Robotics are as competitive and as time consuming as any sport, and deserve the same recognition. We are giving FIRST that vision, allowing us to reach people far beyond the limits of our small town. In retrospect, Team 3655 is not just spreading the message of FIRST we are carrying that message with us wherever we go.

Our journey is not over as we continue to build hands-on K-12 learning in our community and increase the sustainability for the future of our program. We could not have done all of this without FIRST Robotics and the values that the program taught us as a team and a community. Tractor Nation is just getting started on our mission to spread the values of FIRST and create the next generation of leaders.