

Chairman's Award - Team 2169

Team Number
2169
Team Name, Corporate/University Sponsors
Boston Scientific Corp/UTC - United Technologies/Seagate/Rotary Club of Prior Lake/Lunds & Byerlys Grocery/Engineering Partners/VTI security/Prior Lake-Saveage area schools/Mankato State University (MSU)&Prior Lake High School
Briefly describe the impact of the <i>FIRST</i> program on team participants with special emphasis on the 2016/2017 year and the preceding two to five years
While in FIRST, students have the opportunity to hold small-scale leadership positions and contribute to several technical projects. Team members develop instruction, cooperation, organization, innovation, and communication skills. Because of participation in FIRST, 87% of KING TeC alumni have pursued STEM-based post-secondary education. Alumni have gone on to work at Sandia National Laboratory, Boston Scientific, National Instruments, the US Navy, and have started their own companies.
Describe the impact of the <i>FIRST</i> program on your community with special emphasis on the 2016/2017 year and the preceding two to five years
KING TeC reaches out into the community through outreach and partnering with other activities. The team demonstrated their robot to fairgoers and provided information about FIRST at STEM Day at the Minnesota State Fair, where attendance reached 111,902 people. At Synergy Night in Prior Lake High School, KING TeC allowed children to operate their robots to peak interest in FIRST. In support of the high school's theater program, team members built a robot to serve as a prop in some productions.
Team's innovative or creative method to spread the <i>FIRST</i> message
KING TeC maintains an app targeted at rookie FRC teams to help them not only survive their first year, but also build a well structured and sustainable team. The "FRC Survival Guide" App contains valuable resources including detailed knowledge of strategy, mechanical, electrical, programming, fundraising, and business along with a week by week schedule of build season. The app is already available in Android and web versions, and an iOS app is in the works.
Describe examples of how your team members act as role models and inspire other <i>FIRST</i> team members to emulate
KING TeC members embody the spirit and ideals of FIRST through Gracious Professionalism and taking initiative to assist other robotics teams. High school students mentor participants in Jr. FLL, FLL, FTC, and KING TeC's own in-house middle school robotics program. Within these high school students, designated leaders serve as head mentors for these subprograms, and work to create an inclusive learning experience for all program participants.
Describe the team's initiatives to help start or form other FRC teams
KING TeC exists in an area of Minnesota saturated with FIRST Robotics Competition teams, and as a result works to improve sustainability within the FRC community. The team has created an FRC Survival Guide to provide other teams with detailed guidance on a variety of topics. Teams can use this in their early years to build a strong foundation for a lasting program at their schools. KING TeC also presents at various events and workshops to share the knowledge needed to maintain successful teams.
Describe the team's initiatives to help start or form other <i>FIRST</i> teams (including Jr.FLL, FLL, & FTC)
KING TeC provides young students with the resources necessary for building a successful team able to stand the test of time. Every year, the team hosts an FLL Summer Camp, where student mentors teach children entering the program about strategy, building customizations for their robots, and FLL in general. KING TeC has also released an FTC Survival Guide to include in teams' kits of parts, designed to create an understanding of all aspects of the program and start a thriving team.
Describe the team's initiatives on assisting other <i>FIRST</i> teams (including Jr.FLL, FLL, FTC, & FRC) with progressing through the <i>FIRST</i> program

KING TeC, along with mentoring several teams in all levels of FIRST, also teaches classes to members of their subprograms. The team hosted an FTC Summer Camp with classes covering topics including awards, fabrication, and tools, designed to help students have an easier transition from KING TeC's in-house middle school program. The camp also built teamwork skills within newly formed teams, ensuring team members worked well together before the FTC build season began.

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)

KING TeC mentors over 40 teams in Jr. FLL, FLL, FTC, and their own in-house middle school program. On Tuesdays and Thursdays through fall and winter, all the subprograms meet under one roof and work on their robots. Members of FRC provide guidance throughout the engineering process on a variety of topics for each team depending on the team's needs and the mentor's specialty. These mentors attend almost all of their team's build sessions and guide the team throughout the length of the session.

Describe your Corporate/University Sponsors

KING TeC has a variety of sponsors, ranging from local companies to corporate entities. Due to extensive involvement in their community, KING TeC has numerous local sponsors, including Engineering Partners International, Lunds & Byerlys, and Prior Lake Rotary. In addition to local support, the team has major corporate sponsorship from PTC, UTC, and Boston Scientific. Monetary and material donations provided by these sponsors play a key role in sustaining the team.

Describe the strength of your partnership with your sponsors with special emphasis on the 2016/2017 year and the preceding two to five years

KING TeC has long term relationships with their sponsors, showing gratitude to supporters by holding demonstrations at company-hosted events and Community Fest at Prior Lake High School. This year, KING TeC presented their robot to UTC and Boston Scientific to showcase the impact they have on the team. At Community Fest, KING TeC conversed with local STEM oriented businesses to gain sponsors and spread the message of FIRST to industry professionals.

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

FIRST is an international organization which strives to create an environment where science, math, technology and engineering are as exciting as sports. This program provides youth with the opportunities to learn and practice lifelong skills including leadership, communication, and time management. Over the years, numerous corporations have extensively supported FIRST for one reason; the students in this program are the future - they are the engineers, programmers, and designers of tomorrow.

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

Seeking to improve alumni involvement, KING TeC members sought to engage former teammates by hosting an annual alumni night, titled Pizza and Panel. At this event, founding members start the evening by presenting about engineering as a career. From this, the event transitions into a panel of these members and other alumni who answer any questions posed by current students. Questions range from career and college major choice topics to methods of building a cohesive team.

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

Katie Rapley

Essay

The world does not change simply because we want it to. Transforming culture requires an entire community. But one idea can empower thousands. One act can ripple into something incredible. One team can make the difference. Ten years ago, FIRST FRC Team 2169 KING TeC began as 21 kids in a barn with an idea. One decade later, every person in our community has the opportunity to participate in FIRST robotics. From the moment its students enter kindergarten, through the day they receive their high school diploma, and into life as an adult in the workforce; Prior Lake-Savage's community is immersed in robotics culture.

One of KING TeC's top priorities will always be community involvement. We participate in over 20 community events annually. Lakefront Days, a local community celebration, continues to be one of our favorites. Each year since the team's founding in 2007, KING TeC members have created a castle float and donned their capes and crowns for the city-wide parade, kicking off a three day celebration. Recently, we have volunteered at other portions of the festival while demonstrating our robot to over 2,169 community members in attendance.

Beginning at Freshmen Orientation, KING TeC is ready to help students assimilate into high school. We believe in inclusion, and strive to ensure students are aware of all opportunities FIRST offers. This year we staffed four booths demonstrating FRC, FTC, photography, graphic design, business, and marketing opportunities to incoming freshmen. This year, in order to immerse students in STEM education as soon as possible, KING TeC brought an FRC robot and robotics related children's books to local libraries, giving the youngest members of our community the chance to see engineering fundamentals up close.

Demonstrating the benefits of engineering has made KING TeC one of the most prominent organizations in our city, but we wanted to reach our community more directly. By offering programs at each level of FIRST, KING TeC provides K-12 students with the opportunity to experience STEM first-hand. KING TeC is also committed to ensuring a high quality of mentorship, so we have appointed a student captain for each one of our subprograms. This captain oversees the KING TeC members who are mentoring their subprogram, conducting any necessary mentor training before the start of each season. KING TeC hosts build nights twice a week in our high school to give all Jr. FLL, FLL, FTC, and in-house program students full access to all KING TeC resources.

The reflection heard most frequently at our end of the year banquet is that students wish they had been involved in the KING TeC suite of programs sooner. At KING TeC, we believe it is critical to introduce students into STEM as early as possible. In 2016 the team invested in one of the largest single shipments of Jr. FLL kits, ensuring every student in our district can further their STEM education. This year we reached 51 students and formed 12 teams. From day one, KING TeC students establish a connection with Jr. FLL members, prompting them to ponder the way simple machine components such as gear ratios affect life, and demonstrating how essential engineering is in the modern world.

In fourth grade students graduate from Jr. FLL to FLL, taking the next step in their robotics career. Aware of this technical leap, KING TeC members who are fluent in EV3 programming encourage FLL students to reach beyond what they know in order to grow their engineering knowledge base. This year KING TeC mentored seven teams, two of which advanced to the State Championship. In the 2017 season, KING TeC also organized our first annual FLL summer camp. This camp provided inquiring students with a taste of the program before the season started, while simultaneously serving as an opportunity for returning FLL students to tackle missions they were previously unable to conquer.

In 2008 Minnesota lacked a statewide robotics program for middle school students, so KING TeC created their own in-house robotics program modeled on FIRST principles. This program is complete with a yearly competition challenge and field, culminating in a KING TeC-run tournament. The team saw the need to give 6-8th grade students the opportunity to work in smaller teams where each student has a more prominent role in robot design and build. This program helps students build technical skills before graduating to more complex robot design in FRC. In 2017, we reached 95 students and formed 20 teams, all mentored by KING TeC members who are experts in robot design.

Building on experience gained by creating and managing our in-house robotics program, KING TeC brought FTC to the state of Minnesota. In 2009, KING TeC ran a World Championship qualifying FTC event, and began laying the groundwork for what would become one of the largest and most successful state-wide FTC programs in the world.

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As students enter high school, they join one of KING TeC's nine FTC teams. Each team has at least one designated KING TeC student mentor and full access to our fabrication workshop. All KING TeC mentors who assist our FTC teams have been through the program themselves; their guidance helps our 51 FTC students excel within their teams. This year two of our teams advanced to state by winning the Innovate and first place Inspire awards. In 2017 we also introduced an FTC summer camp where we offered 15 different presentations to interested students. During the six week camp, new members were given the opportunity to learn more about basic FTC skills, and develop relationship building skills. Camp classes, taught by KING TeC members, ranged from Mechanical, to Programming, to the Inspire and Promote awards.

Over the past decade, KING TeC has grown from a small FRC team with no technical mentors and rudimentary tools, into a sustainable K-12 robotics organization of nearly 300 students who partner with industry professionals. In 2007, success was simply a rolling robot on the floor. Since 2007, the team has built on this success by creating an inclusive program for all interested K-12 students in the Prior Lake-Savage school district, while bringing knowledge of robotics to the community as a whole. Now success is much more; KING TeC strives to empower every FRC team to thrive for decades by helping others and sharing strategies to create a sustainable program.

This year KING TeC has focused on documenting useful information we have learned over the past ten years and compiling this information into a series of Survival Guides. We expanded our Six Week FRC Survival Guide into a much more comprehensive manual for both the FRC build season, and the FRC offseason. The guide is available on our

website and as an Android app. KING TeC FTC student mentors created a similar FTC Survival Guide covering topics including CAD, fundraising, and programming. This guide is also available on the KING TeC website, and will be given to each of our FTC teams in their Kit of Parts beginning September 2017.

Acknowledging that many teams may not seek out our guides on their own, KING TeC teaches live classes and demonstrations on material within the guides. The team teaches 20 unique classes for FRC and FTC at our summer camps, off-season competitions, FRC kick-off, and MN Splash to reach as many students as possible. Our cornerstone classes include our highly anticipated Drivetrains, unique 3D Printing, and greatly attended Business and Imagery presentations. This year we ran over 50 sessions, allowing us to reach as many people as possible. This keeps our student to presenter ratio low, giving us the strongest possible connection to students attending our classes.

KING TeC has grown from a single FRC team into a robotics enterprise. Our depth and breadth of programs is simply unparalleled anywhere in the state of Minnesota. Our favorite way to celebrate all ages of robotics coming together under one roof in our community is Minne-Mania. This event began in 2010 as the first offseason FRC event in Minnesota. Each year 36 FRC teams from the Upper Midwest come to our high school to compete in the Minne-Mini, a competition where teams replay last year's FRC game. The Minne-Mini remains the longest running offseason FRC regional in Minnesota, and requires the use of both our high school's gymnasiums, and our 92 FRC team members to organize and run. On the first and second floor, KING TeC students give presentations to rookie and veteran teams alike on subjects including Programming, Spirit, and Strategy. KING TeC encourages other teams to host classes with us, ensuring all 36 teams in attendance can learn something new at every Minne-Mini. This year there were 14 unique classes for teams to attend.

Two years ago, KING TeC evaluated the space our high school had to offer, and decided to broaden the scope of the event. The Minne-Mini expanded to include a Jr. FLL Expo, a full-day FTC showcase, and a complete FLL qualifying competition. The Minne-Mini became Minne-Mania, and over 2,000 people attended. This is the only event in Minnesota showcasing every level of FIRST. KING TeC students hosted our school board, superintendent, and local congressmen to experience the full scope of the KING TeC enterprise. For those unable to attend, KING TeC was active on our social media platforms and set up a livestream on our website. Because of the success of Minne-Mania, four teams have asked for our mentorship as they collaborate to create a off-season regional in their community.

Ten years ago, KING TeC began as 21 kids in a barn with an idea. One decade later we have evolved into a thriving community of nearly 300 passionate students. Through everything, KING TeC has never forgotten that change requires action, success requires failure, and one idea, one team, can make the difference. Our hope is that our actions will serve as a catalyst for change within other communities, and together we can make a lasting impact on the world.