

## 2014 Chairman's' Award Essay

The fields of science, technology, engineering, and mathematics (STEM) are vital. The continued growth of STEM fields is necessary in order to continue improving the world. This is why FIRST is necessary; the program encourages the growth of STEM by inspiring young people to pursue fields in STEM, encouraging them to find and follow their passions. Through this they will leave a positive impact on the world with their creativity and innovations. FIRST Team 342: The Burning Magnetos fully embodies this idea; the team's mission and motto is to "Take the message farther!" 342 seeks to spread this message to as many people as possible through our activities in the local and global communities. Moreover, we have expanded our vision by seeking to instill a passion so strong that they will in turn inspire others.

After Team 342's inception in 1999, members consisted of students from 13 high schools, mainly those in Dorchester District 2 (DD2): Fort Dorchester (FDHS), Summerville (SHS), and Ashley Ridge. We always supported area FLL teams, who became the feeding pool for our successful FRC program. As the team grew, we saw how FIRST positively impacted the students and our local community. 75%+ of students on the team went on to pursue careers in STEM, either after earning a degree or directly entering the workforce. Through our strong partnership with Robert Bosch, LLC, several have gone to the Bosch apprenticeship program in SC and later joined Bosch full time. 8 team alumni came back to mentor 342, and 20+ others have mentored FIRST Teams throughout SC, including FRC Teams 3196, 4451, 4171, sharing their knowledge and inspiring other students to take our message farther.

Our team has been a crucial part in the growth of FIRST in the Low country. By working with Bosch and other local industry, 342 was actively involved with the Palmetto Partners in moving the SC Palmetto Regional location to Charleston for 2011-2012. As a result, local students, mentors and new sponsors experienced first-hand excitement of FIRST and learned what it is FIRST was all about. The relocation of the Regional aided 342 to grow the FIRST FRC program. Since 2010, 342 has contributed to the formation of 8 FIRST FRC teams: 3475, 3489, 3490, 4083, 4243, 4261, 4533, and 4748. 342 assists these teams by providing mentoring, training, supplies and funding support and helping troubleshoot. In this environment, both teams' members and mentors collaborate and share knowledge. This especially shows rookie FIRST Teams gracious professionalism in action, a skill they will soon learn and emulate. Team 342

also supports other FRC teams at competitions in the spirit of co-opertition and gracious professionalism by helping repair robots, giving parts, lending tools, and aiding in strategy.

We are actively involved with 6 FLL teams. Our team members attend the work sessions and mentor the young FLL students weekly, allowing them to develop their critical thinking through the research, design, and build aspects of the program, teaching them the core values of Gracious Professionalism and Co-Opertition. We plant the seeds for future involvement in FRC and success in STEM.

342 promotes awareness and the importance of STEM and FIRST throughout the community at every opportunity. It starts by bringing Burnie, the team robot, to professional events like Barcamp CHS and Dig South to gain the recognition and inspire local business leaders to become involved. Burnie participates at events, like Bosch Family Day, to involve young children, who someday may become FLL/ FRC participants. In the community, 342 volunteers in 10+ local events yearly, taking Burnie to the Walk for Autism, Water Missions International, Earth Day, and others. When not in competition, 342 spends 100+ hours helping local organizations.

342 is currently working with our sponsors to establish a “Bosch Academy STEM Room” at Fort Dorchester High School (FDHS). In September 2013, 342 met with the FDHS principal to request 4,000 sq. ft. open space in the school’s engineering wing for our robotics activities. The purpose was to begin the process of fully integrating the FIRST FRC activities into their engineering curriculum and to begin the first steps toward a Youth Apprenticeship with Bosch. The team moved materials and equipment to the room for use in training and build activities. By the end of this season, we will have completed the transition and will have a complete machining center, programming work stations, and assembly area and even an area for a practice field. By working at the school site, FRC and FIRST will become an integrated part of the daily school life. It will be a location where not only FDHS students, but team members from the other local teams can continue working toward the ultimate goal of a career in our manufacturing community; inspiring more students to take part.

Bosch and DD2 see the value in having this room and transforming it into a “STEM Room” to promote science and technology in the school and district. 342 is working with Bosch, DD2, and Trident Technical College (TTC) to form introductory machining and technical classes which will be conducted in our team’s facility. Classes would be taught by a mix between Bosch

apprenticeship and TTC instructors, with year-round support/involvement of our team members. It will be called the “Bosch Academy” at FDHS. This would primarily be used to train students who plan to enter the workforce directly after high school, as a recognized Youth Apprenticeship. 342 has taken the responsibility to develop / transition this space for our FIRST needs. We are coordinating with our sponsors the specific activities. For example, sponsor Phillips Industrial Services Corp. renovated the room, adding chemical-resistant industrial-grade flooring. Bosch will soon professionally install machining equipment that it donated. The linkage of industry and school as an initiative to promote STEM has already become an attractive prospect to other schools in the district. Summerville High School (SHS), one of the two high schools with FRC Team 3489, is looking to copy our plan, searching for possible local industrial companies to partner with in order to establish their own STEM room. 342 will assist Team 3489 and with other local companies in order to spread “STEM Room” concept across the Low country.

In 2009, 342 established the Summer PyGames, a programming competition in using the programming language Python to code open-source educational games for elementary schools. These games support basic arithmetic computation, reading, and writing. Teams programmed these open-source games primarily to run on the XO laptops. The One Laptop per Child foundation designed these XO laptops to be rugged, low-cost, and low-powered. The Summer PyGames witnessed rapid growth, growing to 12 teams in from 2009 - 2011 throughout the country. Through the Palmetto Project, a non-profit founded by Phil Noble dedicated to innovating solutions to SC’s socioeconomic problems, nearly 3000 XO laptops were distributed throughout elementary schools in SC, in economically troubled regions in particular.

Extending on the idea of taking the message farther globally, Team 342 has expanded STEM to Port Victoria, Kenya. Through our link with a volunteer in the US Peace Corps there, Team 342 sent 3 XO laptops with educational games developed during the Summer PyGames as a pilot project in 2012. The laptops had a positive impact with their local school. Team 342 sent 10 additional computers, monitors, and other hardware in August 2012, with the help of a large transportation company, Panalpina. Working together with their community leaders and the Peace Corp volunteer, we assisted in what was forming a community computer lab for adults and students. Due to the high demand, grants were acquired to buy more XO laptops and computer hardware in summer 2013, and Team 342, together with DD2 schools, set up a mobile classroom

with four elementary schools in Port Victoria. Team 342 also sent XOs that were decommissioned from the Palmetto Project's XO program. These young students are receiving math, reading, and writing lessons through the laptops. On days that classes use the computers, attendance skyrockets! Children in Port Victoria have obstacles in their education, like poor educational infrastructure and the need for them to work to provide for their families. On average, \$2 is spent per student per year. So, by sending these computers, Team 342 is increasing these students' desire to learn and go to school, leveraging the STEM work done by the OLPC Program.

Team 342 works with DD2 in establishing a cultural link between schools in Port Victoria and DD2 schools. In February 2013, representatives from 342 and DD2 communicated with a Peace Corps representative and Port Victoria high schoolers through video call at local Joe Pye Elementary School with FLL Team 13275, asking and answering questions about life and education. After the initial call, the district began formulating a plan to expand the program using STEAM, which is STEM infused with arts. Team 342 contacted EnvisionSC, an organization by Phil Noble created to enhance SC's status. By partnering EnvisionSC with DD2, a "World Scholars" program has been established in which classes will be partnered with a class from another nation. So far in FDHS, there have been 4 classes partnered with Kenya, Spain, Jamaica, and Romania. These connected classes video call one another periodically using the VGo Robot, a drivable robot with a camera and screen. This allows classes to talk to each one another, giving students an opportunity to learn from the different cultures with a focus on STEAM while working on projects specific to that subject, like math or Spanish. Team 342 will help expand this program to more classes and schools, ensuring that FIRST robotics is also tied in in order to "Take the Message Farther!" on a global scale.

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