

Financial Plan

Our long term financial goals included raising enough funding to purchase laptops and equipment to improve the quality of our work, build a practice robot identical to our competition robot, and attend a second regional. We wanted to improve our relationships with current corporate sponsors and secure additional sponsors to enable us to meet these goals. We also wanted to build a base of individual donors giving small and large donations from our neighborhood and around the world. In the event that we qualified for the World Championship, we would need an emergency action plan to raise the funds necessary for us to compete in St. Louis.

In the 2013 Build Season, through grants from our old and new corporate sponsors as well as donations from our first crowdfunding campaign, we were able to build a fully functional frisbee-throwing robot named Sir Tinko and purchase a few programming laptops. At the New York City Regional Competition, we made it to the finals and won the Chairman's Award, the most prestigious honor given at the competition. This qualified us for the World Championship in St. Louis. We had one week's time to secure pledges for the \$5,000 registration fee plus the travel expenses involved for our team of 40 students and our mentors. Within a week, our founding partner Con Edison and our new partner, Bloomberg, pledged \$25,000 towards our trip. An additional \$4,000 was raised through team fundraising efforts.

A surplus of 2013 funding as well as supporters through Donor's Choose and a friend of the team allowed us to introduce to our workshop two 3D printers and a CNC machine in 2014. In addition, though we were not able to build a functional practice robot, we built a second drivetrain to practice our driving skills as we waited for the NYC regional competition.

In the 2015 season, four Bloomberg mentors committed their Dollars for Hours to our team, and Xerox increased funding to make it possible for us to travel to a second regional event in Rochester, NY. In the same year, we held another successful crowdfunding campaign, raising over \$3,000 with more than 50 supporters sponsoring specific pieces of our robot, DragoKnight.

Our goals included the addition of STEM classes to FDA curricula, and getting necessary equipment and supplies for those classes. In 2012-2013 we secured a grant through Mr. Robert Schwartz to purchase new VEX kits for the robotics class. 2013-2014 came with the new offering of a Mechatronics class, which is a combination of mechanical and electrical engineering for tenth and eleventh graders. The generosity of Mr. Schwartz enabled us to purchase soldering equipment and other needed supplies for this class. In the summer of 2014, Mr. Schwartz's support enabled us to remodel the work tables and furnish the room with uniform stools. This has vastly improved our work environment and productivity.

Technical Plan

Room 108 is the home of the Harlem Knights; however, it began as a cluttered storage room with “tables” that were made of large slabs of wood on top of 50 year-old roach-infested lockers; for years, we cut wood and metal with an ancient table saw or a hand saw; the school also has a lathe that no longer works. Our long term technical plans included renovating our workspace, obtaining new laptops for our Programming and Business committees, a CNC machine for cutting wood and metal, a 3D printer in order to create customized parts, and a drill press.

Our big leap came in the 2014 season, when we added a CNC machine and two 3D printers to our workshop. We viewed our season as a building year, knowing there would be a steep learning curve with our new equipment. Students learned to do CAD drawings, and our robot, Tinko Stallion, had pieces that students designed and printed with a Makerbot. One year later, we are still learning, but our long-term goal is to become experts with our machines and be able to offer assistance or tutelage to surrounding teams.

In the summer of 2014, our workshop got a facelift. We said goodbye to the dirty old lockers and reconstructed the work tables with new legs and electrical outlets along the tables, storage under the tables. Broken stools were replaced with new adjustable stools. This has allowed for a better work environment with increased productivity.

Outreach Plan

Our goal is to spread the message of FIRST and raise awareness of STEM education in the Harlem community, the city and the world. The Harlem Knights has had such a positive influence on our school that our principal, Joseph Gates, decided to form a School of Engineering with a four-year course of study. In three years, FDA1, a Title 1 school, has integrated robotics, mechatronics, art for engineers, engineering and computer science courses into the curriculum. During Build Season, three of these courses interface with FRC, resulting in over 200 students working on our robot each year and drawing students to join the team. It is our goal to streamline all five classes with the FRC season.

While the influence on our school community is evident, we also strive to let the public know about these opportunities available in STEM education, opportunities not only for elite and wealthy schools, but even possible at a Title 1 public high school filled with students from low-income families. We participate annually in the District 5 Super Saturday! STEM Expo, where robotics team members design a new VEX robotics game, mentor robotics class students, and facilitate and judge the FDA1 VEX Robotics Competition at the event. We would be happy

to help other schools implement this class into their curriculum as well, and perhaps in the future, it can be a District 5 competition.

In October 2014 the robotics team assisted in a public event in the plaza of the Adam Clayton Powell Jr State Office Building on 125th Street. We brought our robot Tinko Stallion to do demonstrations, and invited the public to cast their votes for the “hack-o-lanterns” designed and programmed by mechatronics and art for engineers students.

From 2013-2015, we have written press releases to local and national newspapers and magazines, speaking about our team and the spread of STEM through FIRST. In March of 2013, we were featured on NY1. In April of 2014, we were interviewed by NY1 for its segment, “It Ain’t Rocket Science.” In 2015 we were interviewed and filmed for Columbia's weekly video series called “Seen in NY” for their online publication New Learning Times (NLT). In the fall of 2013 we also had the privilege of representing FIRST to 800 technologists at the NYTech Meetup. Looking forward, we would like to continue to explore new avenues of making it loud to the public about the impact FIRST is having on children and teenagers worldwide.

Recognizing the importance of giving back when we have been given so much, our team would like to continue engineering solutions for the needs of local non-profits after the robotics season is over. The impact of FRC on us as individuals and as a team motivates us to make this opportunity available to younger children nearby. In 2016, we would like to start a Jr. FLL team in C.S. 200, the elementary school adjacent to FDA1.