

Team 359 Hawaiian Kids-NASA 2011 Program Growth Grant Writeup

Waiialua High School depends annually on the FIRST program to help students become interested and excited in pursuing math, science, technology and engineering as possible career choices in post secondary education. The main factors in defining success on our team are when students annually are able to successfully complete a set of rubrics that we have established ranging from a set of core values to meeting academic learning opportunities. For example, the specific set of core values that we assess/target are teamwork, responsibility and commitment. These are real-life skills that students will need in order to be successful in whatever career choice(s) they make. FIRST Robotics is an excellent "vehicle" in which we can target more than just academic skills alone. If academics alone were the only criteria in which we operated our team, we would not be able to meet the challenge of creating a robot in 6 weeks, in addition to participating in regional(s)/championship events. The past success of our team is a representation of the hard work and effort that has gone into this program and a measure of the program being able to effectively address the academic and real-life skills our FIRST Robotics program offers.

A. As in the past, our team has an ongoing focus to improve the collaboration between students, faculty and community partners in successfully meeting the challenges of FIRST. Our team has been very successful in having mentors teach and work with both teachers and students as we all work together towards meeting the tasks provided by FIRST. Our Robotics team is comprised of 5 major areas: Administration, Construction, Construction Support, Outreach, and Documentation. The faculty is in charge of Administration and Documentation. We have mentors that have taken the lead in the areas of Construction and Construction-support with faculty members working closely with them. The Outreach program is led by our student team captains this season.

B. It is our belief that in order for each stakeholder to be successfully involved with the team, there must be some benefit (learning experience) that they can attain while working with others. It cannot be just students gaining positive learning experiences and faculty/mentors providing them. Mentors have just as much to gain when they too learn about teamwork, responsibility and commitment in making sure that learning objectives are being transferred to students. The success of a teacher/mentor is judged by how effectively they have transferred their knowledge and skills to team members learning them.

The Waiialua High School Robotics team operating budget is projected at \$110,000.00 this school year. The breakdown is as follows:

Budget 2010/11SY:

Dated proposed revenue and expense budget for the project, indicating other potential and current funding sources and the duration of time over which funds will be needed:

Start Date, Source of funding, Description of Item, Expenses, Duration:

8/1/2009, Balance from previous year, Donation and thank you letter expenses, startup costs, \$1,000, 10 months
8/1/2009; 21st CCLC grant, Learning Center, and donations; Robot materials, parts, and equipment; \$15,000; 7 months
8/1/2009; 21st CCLC grant, Learning Center, and donations; Computers, computer supplies, computer; \$10,000; 10 months
8/1/2009; 21st CCLC grant, Learning Center, and donations; Lesson activities, units, and class supplies; \$3,000; 10 months
1/1/2010; Donations; Uniforms; \$1,500; N/A
1/1/2010; Donations; Gifts to other teams, event coordinators; \$1,500; 6 weeks
11/1/2009; 21st CCLC grant and Learning Center; FIRST Robotics competition entrance fee: \$5,000 San Diego event (hopefully covered by NASA grant), \$4,000 regional events, \$5,000 championship event; \$9,000; N/A
8/1/2009; Team fundraising, business partnership; Robotics regional expenses: Airfare, hotel, transportation, meals; \$34,000; 8 months
8/1/2009; Team fundraising, business partnership; Robotics championship expense: Airfare, hotel, registration; \$23,000; 9 months
4/1/2010; Donations; Thank you awards, plaques, and gifts; \$2,000; 2 months
Total Amount needed:\$100,000

Mr. Melvin Matsunaga, Retired Machinist, University of Hawaii.
Mr. Randy Wood, Computer Programmer, Retired Computer Engineer
Mr. Stuart Nishimura, Mechanical Engineer, NAVSEA Warefare
Mr. Floyd Matsumoto, Retired Telecommunications Field Worker, Hawaiian Telcom.
Mr. Malcolm Menor, Nuclear (Electrical) Engineer, Pearl Harbor Shipyard
Mr. Matthew Menor, Graduate Electrical Engineering student, University of Hawaii.
Mr. Jeff Bruno, Undergraduate Mechanical Engineering student, University of Hawaii.
Mr. Joseph Gudoy, Pipe fitter and Welder, Honolulu Community College.
Mr. Garrick Ferreira, National Guard, Schofield Barracks
Mr. Cody Smith, University of Hawaii, Engineering Student, Alumni
Mr. Adam Butac, University of Hawaii, Engineering Student, Alumni
Ms. Brianna Acosta, University of Hawaii, Business Communications Student, Alumni
Each individual listed above is a member of the Waiialua High School Robotics team. Each person either has previous experience working with FIRST Robotics and/or are experts in the areas of fabrication, mechanical and electrical concepts, computer programming and control, and the use of Autodesk software for CAD and animation. In addition, faculty members also have experience in all of the above mentioned areas necessary to be successful in this project.

Our school's biggest educational goal is to incorporate STEM (science, technology, engineering, and math) into our curriculum with the intent of increasing the number of students who pursue post-secondary endeavors in STEM and Communications. FIRST is one of the culminating assessment projects that students can participate in, demonstrating the concepts learned in their other core classes. In addition, other life skills learned in guidance class can be applied in FIRST as students learn to develop core values in their approach to learning activities. FIRST is currently offered as an Integrative, Technology

& Engineering (ITE) credit at our school as part of a capstone course in our ITE career pathway and the Arts & Communications career pathway. Students can utilize one of their elective courses every year in high school to earn credit for being part of the FIRST Robotics project. Our curriculum has been developed to meet both State and National standards while students participate in the FIRST Robotics project. Rubrics, formative and summative assessments, and data are utilized to ensure that every student who earns credit, has the necessary skills associated with that credit.

Our school has been very supportive in allowing us to utilize and develop 910 different classrooms/shops in the participation of the FIRST Robotics program. Some of the shops are utilized for other programs as well. Our Woodshop is a perfect example. It also services our Building and Construction Academy.

We utilize the woodshop, machine shops (2 total), electrical shop, autoshop (welding and fabrication), Robotics room (supplies and fabrication), graphics room (webpage documentation), Media center (video), and 2 Robotics classrooms(CAD, animation, Chairman's award, Woodie Flower's award, VEX and FLL robotics) to design, prototype, document and build our robot.

In addition to creating a robot, our team utilizes the facilities: To participate in the 3DStudio Max animation contest, Uses the Autodesk Inventor program to design our robot, Maintains a website to document the team's experiences throughout the year, Uses the woodshop to create a cart, game field pieces and crate, And creates a documentary video highlighting the teams learning experiences throughout the year.

Our robotics program is supported at all levels from the school, district, and Hawaii State government. Our district superintendent provides annual funding of \$2,000.00 in facilities/maintenance funds to ensure that all 10 of our facilities are properly equipped with supplies and operational tooling.

Our principal has allowed us to use 10 different facilities to support the robotics program, including access to the cafeteria whenever Robotics meetings, events, and robot testing is necessary. Most importantly, our Hawaii State Governor Ms. Linda Lingle, is a well-known advocate in the FIRST community, who has lead several initiatives to support Robotics education in Hawaii via legislation such as the TANF grant, ARRA federal stimulus funds, and Act 111 legislative funds.

Our FIRST Robotics team has one of the most fundamentally-sound structures in which we ensure that all areas of FIRST's objectives are addressed and met in terms of learning experiences, following State and National Standards (STEM); collaborative partnerships with student, faculty and mentors; mentorship of other schools and FIRST programs; long term financial support incorporating fundraising, businesses, community, and federal grants; participation in local and statewide service/outreach projects; and most importantly, preparing students for post-secondary education via core values.

Our team sponsors State-wide training workshops in the areas of engineering, program management, sustainability, CNC robot design/construction, and mentorship in the FIRST program. We continue to provide workshops to both rookie and veteran teams tailored to their specific needs, especially since the current world economic situation has forced teams to do more with less. The new FRC control system also provides a

challenge to the newer teams, where we can provide additional resources/assistance to them on a regular basis.

We have been able to sustain a program where the nearest competition was over 2,600 miles away, over the Pacific Ocean for 8 seasons up until the inaugural Hawaii FRC event in 2008.

In addition, we have had much success in competitions winning several regional championships, three Chairman's awards, several website awards, team spirit, good sportsmanship, several robot quality awards, entrepreneurship/sustainability plans, judges awards, and most proudly, the Championship Engineering Inspiration and Judges Award (the last two years) in past competitions which we feel are due to our team's philosophy and mission goals. "It's not all about winning.....it's about teamwork, commitment, and responsibility."

As a State leader in the Hawaii Robotics Community and the original first FIRST team in Hawaii, we are committed to helping rookie and less experienced teams create a formula for success so that their students can enjoy the benefits that FIRST can offer for years to come.