



Grant Request: 2016-2017 School Year

Date: October 28, 2016 Name of Organization: Lahainaluna High School Robotics

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Date funding is needed: January 5, 2017

**Reason for Request** Describe project fully; include the monies needed, how it will benefit Lahainaluna High School. Attach additional pages if necessary.

The project is to teach the students how to use Auto Desk Inventor, manufacture what they design, and use those parts to create a functioning robot for use in the FIRST robotics competition. We have secured the Inventor software through an in-kind donation from Lahainaluna HS, but we need the computers with enough power to run the software program and they need to be laptops due to not having a permanent workspace. We also need a lathe and mill, bench top preferred because of the lack of permanent space. They won't be a CNC type yet as we wanted to take small steps in the beginning. These items will be purchased with the Lahainaluna High School Foundation grant.

The activities will be done afterschool through demonstrations, lecture, and practice time. Unit 1 is Safety, Unit 2 is the Basic use of Machines, Unit 3 is Intro to Inventor, Unit 4 is Inventor, and Unit 5 is Advanced Machine use. The students will be taught the Design Process through all the units. Some examples of activities will be: the students take a safety test, parts ID test, procedure test, operational test after all lessons, demos and lectures. Then the students will be given mini-projects like making shafts, bearing holders, and brackets in Inventor and then manufacturing them on the machines. The next step would be to make a manipulator on Inventor, like a simple lever to lift an object, manufacture the parts and then assemble it to use. All these activities scaffold up to the culminating project of the design, manufacture, assembly, and operation of a functioning robot that will compete at the FIRST Robotics Competition. The students will need to keep an engineering notebook to keep track of their work. We use the FIRST robotics competition as framework to teach the STEM skills because it encompasses all areas and not just one or two of them. For example some projects may use Engineering and Technology, but not the Math or Science. FIRST uses all 4 components of STEM.

The learning goals we will achieve through this project are: the students will learn the Design Process. The students will be proficient at using the Inventor program to create a functioning part(s) and/or manipulator for the FIRST robotics competition. The students will be proficient at using the lathe and mill to manufacture the parts created on the Inventor program. The students will be able to share the knowledge learned with other students to promote STEM school wide. The students will understand with clarity the connection between the skills they learned and the STEM field of careers and colleges.

Revised 09/15/2014

# LHSF Lahainaluna High School FOUNDATION

One of the best things about participating in FIRST Robotics is that everywhere and in everything they do, they embed STEM. Our students are exposed to STEM from the moment they start with our team and we introduce them to the FIRST organization. We show them the opportunities that are available to them by joining the robotics team, like scholarships and future internships when they attend college. The colleges and companies are at almost all the FIRST Competitions we attend, they have a lot of information about STEM based college degrees and careers. Our students are lucky to get first hand information from these organizations. One great example is while we were at the Los Angeles regional, there was a women in technology booth that was giving out information about STEM careers for women, our students enjoyed that. The project that we are proposing connects the real life skills needed for STEM careers to what the students have been listening to form various sources. By making a connection between the 2 will give students a realistic picture of the STEM occupations and what skills and training they need to succeed.

We have expanded our robotics program to include Princess Nahienaena Elementary school students. We started an afterschool robotics program last school year and have continued the program this year. Our high school students go to Princess Nahienaena every week to mentor the elementary school students. We have funded this through other grants and using our robotics team funds. We will host a Vex IQ Robotics Tournament on November 12, 2016 in which 18 teams from across Maui County will be competing. It will be held at the Lahainaluna High School cafeteria and 4 teams from Princess Nahienaena and 4 teams from Lahaina Intermediate will be competing.

\$1500.00- 1 laptop capable of running Auto Desk Inventor Software, i7 processor, 16gb ram, video card

\$2250.00- Grizzly Milling Machine with tooling and shipping

\$1250.00- Grizzly Bench top metal lathe and shipping

List any previous funding from LHSF, (year(s) & amount(s)):

2014- \$5900, 2015- \$1450, 2016 \$5000

Number of students who will benefit from this 50-60 Grade Level 3<sup>rd</sup>, 4<sup>th</sup>, 5<sup>th</sup>, and 9<sup>th</sup>-12<sup>th</sup>

Total Cost \$40,000.00 Amount Requested from LHSF \$5,000.00

How the balance, if any, will be obtained: We have secured funding from Lahainaluna HS, MEDB Ke-Alahele Educational Fund, Boeing, and our carryover Robotics Funds. We have grants pending with MECO, Monsanto, and McDonalds of Hawaii. We will also hold fundraisers and write letters asking for sponsor support.

Principal Approval: \_\_\_\_\_



11/14/2016

Office Use: Approved \_\_\_\_\_ Declined \_\_\_\_\_  
Reason for decline \_\_\_\_\_