



**2011-2012 Impact Grant Application
COVER SHEET**

For Office Use Only	
Date Rec'd:	_____
Grant #:	_____
Grant Score:	_____
Awarded:	_____

The Hill Country Education Foundation created the Impact Grant program to help provide teachers and campuses with the resources and tools needed to significantly enhance student educational experiences. Grants of up to \$2,500 will be awarded.

Project Title: Finch Robotics

Participating School(s): Vandegrift HS

Total Dollar Amount Requested: \$ 2271.51

Grant Manager/Primary Contact's Name: Rad Allen

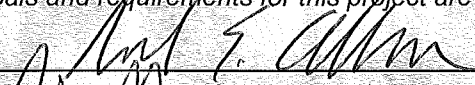
Position and Campus/Dept: Teacher / Vandegrift HS

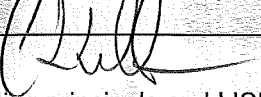
Mailing Address: 9500 McNeil Drive, Austin, TX 78750

Day Phone: (512) 570-2300 Night Phone: (512) 570-2300

Email Address: irad.allen@leanderisd.org

I certify that this would be a good use of funds and supports the district goals and/or the campus improvement plan. I will ensure that the goals and requirements for this project are met.

Grant Manager Signature: 

Lead Principal Signature: 

Please list all other participating principals and LISD staff and obtain their signatures of commitment.

_____ <i>Printed Name</i>	_____ <i>Signature</i>
_____ <i>Printed Name</i>	_____ <i>Signature</i>
_____ <i>Printed Name</i>	_____ <i>Signature</i>
_____ <i>Printed Name</i>	_____ <i>Signature</i>

APPLICATION DEADLINE IS NOVEMBER 1, 2011.

Impact Grant Application

COMMITMENT LETTER

Project Title: _____ Finch Robotics _____

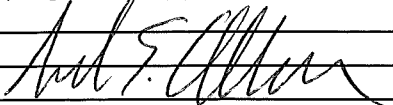
As the party(ies) responsible for the execution and administration of the proposed project, the undersigned pledge to:

- Submit a detailed accounting of all Hill Country Education Foundation funds expended as part of this grant, to be submitted to the HCEF Treasurer.
- Submit a final project evaluation within thirty (30) days of completing this project.
- Obtain parental permission to photograph or videotape participating students.
- Inform HCEF of program events and other opportunities within participating campuses to use for publicity purposes.
- Gather work samples, and/or other visuals to be submitted with the final project report.

I/We recognize that providing the accounting, reporting and publicity items listed above are a condition of funding and therefore are my/our obligation as a grant recipient and manager.

Note: Final project report forms will be sent with grant award letters.

Applicant(s) signature(s):

_____ 

Date: _____ 10/20/2011 _____

Hill Country
Education Foundation
Empowering Tomorrow's Leaders

Impact Grant Application

For Office Use Only

Date Rec'd: _____

Grant #: _____

Grant Score: _____

Awarded: _____

NOTE: Several copies of your application will be made for the selection committee. Please adhere to the number of pages provided. The application should be **no more than 7 pages long, including the cover sheet, this page, project details, and the budget request form.** To ensure anonymity during the selection process, **please do not include your name, the name of your school, or the name of your school's mascot in the title or body of your application.** To denote different locations, use **Campus A, Campus B, Campus C or Site A, Site B, Site C.**

OVERVIEW OF PROJECT:

Project title: _____ Finch Robotics _____

Grade level of students served: Elementary (PreK-5) Middle School (6-8) High School (9-12)

Specific group of students served by course/club name: _____ Computer Science Courses / Engineering Club _____

Proposed project term: One year Two years Three+ years

Start date: _____ January 2012 _____ End date: _____ May 2012 _____

NOTE: Funds will be granted for one year only. For this grant period, the project must be implemented in the 2011-2012 school year, completed by June 1, 2012 and evaluated by June 30, 2012.

Key personnel conducting project: _____ Rad Allen _____
NOTE: Use descriptive terms, not specific names. (for example: 3 middle school campuses, five 1st grade teachers, etc.)

Category (Circle): Leadership Entrepreneurship Science, Technology, Engineering & Math (STEM)

Useful links to your program information: _____ <http://www.finchrobot.com/> _____

Summary of project (100 words or less):

Finch Robots are simple robots created by Carnegie Mellon University to teach programming concepts.

Finch Robots have

- Light, temperature, and obstacle sensors
- Accelerometers
- Motors
- Buzzer
- Full-color beak LED
- Pen mount for drawing capability
- Plugs into USB port - no batteries required

I will use the robots to introduce first year programming students to the Java and Python programming languages. The robots are a great way to show real time results of looping structures, conditionals, and dynamic programming. The Finch Robots do not need to be built. It is a fixed design so that students can focus on problem solving and programming behavior.

PROJECT DETAIL:

Please answer questions #1 through #5 using no more than 3 pages total while adhering to the format guidelines.

1. Details of Proposed Project

Outline the procedures, methods, or activities for the project and *include the timeline* and resources to achieve each step.

In the Spring semester of Computer Science I Pre-AP, we move from GUI based programming languages (Scratch and Alice, drag and drop) to code based languages (Python and Java.) During the 1st semester, students focus on problem solving without the limitations of a highly structured language such as Java. When we make the transition to Python and Java, students have difficult time with syntax. Also, we move from 2D and 3D graphic based output to straight console based output. With the combination of console based output and highly structure syntax, I lose kids. Finch will help us with the transition by using Robots as our output. Instead of seeing black and white text on a screen, they will see a robot move and perform tasks.

Finch Robots also come with a curriculum and a database of programming activities.

Step 1 – Robots must be approved by LISD Technology – Submit Upon Grant Approval

Approval should be immediate. Finch Robots do not require any drivers or software installation. Java and Python are already approved by LISD Technology.

Step 2 – Introduction to Python – January (Week 1 and 2)

I will spend about a week introducing Python and formal syntax. Once students are able to compile and run programs using variable manipulations, I will introduce Finch Robots.

Step 3 – Introduction to Finch Robots – 3rd Week of January

Students will begin compiling programs to operate their Finch Robot. We will explore the Finch sensors, and begin structuring problem solving algorithms.

Step 4 – Integration of Loops, Conditionals, & Algorithms – January through Spring Break

Finch Robots will be integrated into daily lessons and programming assignments.

Step 5 – Transition to Java and Object Orientation - Spring Break through April

Students will migrate from Python to Java since Finch Robots run with different programming languages. I will integrate Finch Robots as I introduce advanced programming concepts such as inheritance, objects, and recursion.

2. Benefits

Please describe how this project will benefit students in Leander ISD. Describe how your project enhances the educational experience in one of these categories: Leadership, Entrepreneurship or Science, Technology, Engineering & Math (STEM). Be specific about the advantages your project offers. Give reasons why this proposal should be funded.

Finch Robots will help students become better problem solvers. Typically, the roadblock for Computer Science students is creating solutions to complex problems. Programming courses teach students to think analytically by breaking problems down into more manageable smaller problems. Finch Robots will help students solve complex problems by visually observing the robots perform programmed behavior. Feedback is immediate.

This proposal should be funded because “real-time” behavior feedback, student ownership of work, and immediate engagement in the learning process is essential to student learning. Finch Robots provide a unique way to teach programming concepts by engaging students directly with their own robot, observing “real time” behavior of their robot, and developing their own solutions to complex problems via the robot.

3. Need and Rationale

Why do you need to do this project? Please list the educational goals and objectives of this project. Indicate how the project is related to a specific school district goal, curriculum area and/or the TEKS.

I am looking for innovative ways of teaching and engaging students. I have been successful with increasing participation numbers in Level 2 and Level 3 programming classes using Video Game Design and Mobile Application Development. The key to this success is that students “see” programming outcome via a game or an application. Unfortunately, the skills needed to produce video games and mobile applications is beyond the scope of a 1st year programming course. Finch robots could provide this level of interactivity and visualization. I hope to see more implementation of higher order thinking skills and a better development of complex problem solving skills.

TEKS Addressed using Finch Robots:

§126.33. Computer Science I

- (c) (2) (A) create and properly display meaningful output;
- (F) display simple vector graphics using lines, circles, and rectangles;
- (H) seek and respond to advice from peers and professionals in evaluating quality and accuracy.
- (3) (A) use a variety of resources, including foundation and enrichment curricula
- (4) (A) use program design problem-solving strategies to create program solutions;
- (B) define and specify the purpose and goals of solving a problem;
- (C) identify the subtasks needed to solve a problem;
- (D) identify the data types and objects needed to solve a problem;
- (E) identify reusable components from existing code;
- (F) design a solution to a problem;
- (G) code a solution from a program design;
- (H) identify and debug errors;
- (L) analyze and modify existing code to improve the underlying algorithm;
- (M) create program solutions that exhibit robust behavior by understanding, avoiding, and preventing runtime errors, including division by zero and type mismatch;
- (N) select the most appropriate algorithm for a defined problem;
- (O) demonstrate proficiency in the use of the arithmetic operators to create mathematical expressions, including addition, subtraction, multiplication, real division, integer division, and modulus division;
- (P) create program solutions to problems using available mathematics libraries, including absolute value, round, power, square, and square root;
- (Q) develop program solutions that use assignment;
- (R) develop sequential algorithms to solve non-branching and non-iterative problems;
- (S) develop algorithms to decision-making problems using branching control statements;
- (T) develop iterative algorithms and code programs to solve practical problems;
- (U) demonstrate proficiency in the use of the relational operators;
- (V) demonstrate proficiency in the use of the logical operators; and
- (6) (C) differentiate among current programming languages, discuss the use of those languages in other fields of study, and demonstrate knowledge of specific programming terminology and concepts;
- (E) understand concepts of object-oriented design;
- (F) use local and global scope access variable declarations;
- (G) encapsulate data and associated subroutines into an abstract data type;
- (H) create subroutines that do not return values with and without the use of arguments and parameters;
- (I) create subroutines that return typed values with and without the use of arguments and parameters;
- (J) understand and identify the data-binding process between arguments and parameters;
- (K) compare objects using reference values and a comparison routine;
- (O) choose, identify, and use the appropriate data types for integer, real, and Boolean data when writing program solutions;
- (P) demonstrate an understanding of the concept of a variable;
- (Q) demonstrate an understanding of and use reference variables for objects;
- (S) demonstrate an understanding of the concept of scope;
- (T) identify and use the structured data type of one-dimensional arrays to traverse, search, and modify data;
- (U) choose, identify, and use the appropriate data type and structure to properly represent the data in a program problem solution; and
- (V) compare and contrast strongly typed and un-typed programming languages.

4. Specific Method of Evaluation

How will you measure the success of this project? Describe the methodology you plan to employ. You must be able to statistically demonstrate the impact of this grant. Relate the methodology to the stated objectives and make the evaluation measurable. In your final report you will need to include hard data from tests, surveys, participation rates, etc.

Goal 1 : Increased Participation in Computer Science 1

If students use Finch Robots and enjoy the class, hopefully they will share their experience with peers. Success for this goal will be measured by increased enrollment figures for the 2012-2013 school year.

Goal 2 : Increased Proficiency in Algorithm Development

Students will use same objective tests as previous years. Success will be measured by test scores on specific problems addressing algorithm development from previous tests.

Goal 3 : Better Problem Solving Skills

In the past, students stall or give up when confronted with difficult programming tasks. To measure success, will measure completion rates at different levels when solving difficult problems.

Goal 4 : Smoother Transition to Python & Java

Students spend a lot of time learning Python and Java syntax. I will measure success by monitoring the number of syntax and compile errors at beginning of unit versus end of unit.

Goal 5 : Increase Student Confidence in Programming

I will measure by conducting pre and post implementation surveys.

Goal 6 : Increase Female Participation in Programming Classes

Research shows that female students shy away from Computer Science courses. By using Finch Robots, I hope to attract more female students based purely on the novelty of the Finch robot. I will measure this by comparing enrollment numbers of female students to past years. I will also conduct a survey at the beginning of the year to find out if female students were attracted to the course because of robots.

5. Sustainability

Explain any plans to continue this project on a short-term or a long-term basis. Describe *how* your project will be sustained in the future. Include any reasons why this project would not be continued.

Finch Robots will become an integral component to teaching Computer Science at Vandegrift. Once purchased, there is no need for upgrades or future purchases of the robots. I have 24 computers in my classroom. There will be a robot for each computer and an additional robot for the teacher. Since the software resides on the computers, there is no need to have separate robots for different class periods. This program requires no further funding. Broken robots or replacements will be purchased via CTE budget.

Reasons for discontinuing Finch Robots:

- If LISD moves to non-conforming operating system with the Finch USB drivers
- If unable to replace broken, lost, or stolen robots
- If Finch Robots did not support new programming languages.

BUDGET REQUEST FORM:

Be as specific as possible with your budget information. Include materials, supplies, equipment and fees. Itemize direct costs, specify prices of, and include make and model of any equipment and materials to be purchased.

Budget Item	Is this item reusable? (yes/no)	Number of Budget Item(s) Needed	Vendor	Total Cost, Including Shipping
Finch Robot	YES	25	Finch Robots	\$ 2271.57
				\$
				\$
				\$
				\$
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				\$
				\$
TOTAL AMOUNT NEEDED FOR PROJECT=				\$ 2271.57
AMOUNT REQUESTED= (MUST NOT EXCEED \$2,500)				\$ 2271.57

- Total number of students **directly** impacted by HCEF Impact Grant: 110
- Budgeted Cost per Student Participating in Project (total amount requested/# of students impacted): \$
- Without funding from the Hill Country Education Foundation, will this project still be implemented?
 Yes **No**
- Does the amount requested cover all expenses?
 Yes No; How much remains to be funded by other sources?
- Is the success of this project contingent upon other funding?
 Yes **No**
- If you have applied for funding elsewhere, please list the names of the organization and the amount requested. Please indicate whether or not that funding has been approved and if not, the expected date of approval.

No other funding requested from other sources for this project.

The HCEF looks forward to reviewing your application.
 Submit your entire application packet by **November 1, 2011** to:
 Hill Country Education Foundation
 2900 N Quinlan Parkway Suite B-240 PMB 109
 Austin, Texas 78732

Award notifications will occur in December.
 ANY QUESTIONS? Email: GrantRequest@HillCountryEdFoundation.org