ALEDO EDUCATION FOUNDATION

Innovative Educational Grant

Cover Page

(Submit as an email attachment with appropriate approval signatures separate of the Grant Application)

Project Title: __Programming our Future_____

Name of Applicant(s) Signature of Applicant(s)

Emily Felker

School(s) McCall Elementary

Grade(s) K-4
Subject(s) Library

Number of Students_____424_____

Amount of Grant $____2439.53_____

Primary target population to be served:
__X_ students (target group:)
___ parents
___ teachers

Implementation dates: Upon arrival of materials

Signature of Principal_____ Date _____

Abstract (no more than 100 words)

Computer science is an important skill to prepare students for tomorrow's jobs, and I see a need for more relevant programming resources at the elementary level in Aledo ISD. Just like learning a language, the earlier students begin computer programming, the more natural it becomes. Many large technology corporations have recognized this need and are funding online coding resources for elementary age students. We have begun using two of these resources, code.org and Scratch via Google CS, on our campus. I would like to help students take what they have learned and use it to program robots for an authentic learning experience.

Central Office Administrative Review Committee Meeting:_____ Date of

General Notes and Comments by the Administrative Review Committee

(Pages 6 & 7 of the Application Packet will not be seen by the Review Committee)

Innovative Educational Grant Application

(Submit electronically as an email attachment separate of the Cover Sheet Pages)

IMPORTANT - Do not include the name of your campus in the Project Title or application.

Project Title:__Programming our Future_____

Grade(s) K-4 Subject(s) _Library___Number of Students __424_____
(List each grade level)

CHECK ONE:
This project is:
X new to the district □ new to my campus □ new to me.
Have you received funds for this project from AISD previously?
□ Yes X No
Have you previously received an AEF Grant?
X Yes □ No

DIRECTIONS: Please provide a summary for each area listed below.

Description of Proposed Project/Activity: (Describe what you want to do with the grant funds. List activities and timeline. How is it a new, innovative or creative for Aledo ISD)?

With the grant funds, I will purchase different programmable robots that students can write code for and operate using iPads. I learned about these robots and was able to demo them while I was at the technology conference,TCEA 2015. I have also visited Curtis Elementary in Weatherford ISD where they are successfully using Spheros as part of their makerspaces, and their students are training other students, teachers, and librarians at the Region 11 Education Center. I plan on getting three different types of robots with different difficulty levels, so that all students may participate. Students have already been exposed to coding during library lessons, and I was able to purchase two Spheros with book fair funds to test during enrichment time with 4th grade. I have used code.org with all grade levels to teach different computer science concepts to every age level. We go deeper into that concept in my 4th grade technology option during enrichment time where students are using Google CS and Scratch to produce actual games. Since students already have this knowledge base, we will be able to begin using the robots immediately upon arrival.

My plan is to purchase Spheros for the entire student population to use in our existing makerspaces. Students participate in makerspaces every time they visit the library for check-out. Spheros allow students to operate the robot using the iPad OR to build their own macros to program the robot using lines of code. For this reason, Sphero could be used with all students of any academic ability. Dot and Dash are more complicated than Sphero and include more accessories and options. These robots will be reserved for 3rd and 4th graders during their makerspace time. Finally, the MakeBlock robots actually have

to be assembled before they can be programmed and operated by students. These robots will be used during 4th grade enrichment only. They will be for students that have a more advanced knowledge of computer science and have been developing those skills since the school year began. I have also invited a Director of IT to come speak to these students about how he has used coding in his job and all of the different tasks that programming can accomplish. I plan to continue to search for partnership opportunities, so that students can learn from those currently in the field of technology.

Up until this point in Aledo ISD, we have only offered programming and robotics opportunities to secondary students. By using the free resources (code.org, Google CS, and Scatch) in conjunction with these programmable robots, we can make computer science accessible to elementary students while also meeting the requirements of the state technology learning standards. In my educational experience, students develop passions and gifts during their elementary years while they are building a strong educational foundation. I want to make these opportunities available, so that when they go to secondary campuses and later in life into their careers, they already have a passion as well as computer science skills.

Here are a couple of videos of students using programming in the library.

A 4th grade student teaching the enrichment group about his game developed using Scratch:

https://drive.google.com/file/d/0B10IPmF9qcHUaG9fM3M4NmxUUVk/view?usp=sharing

A 4th grade student during enrichment that decided to build a maze out of magnets for Sphero and program him to go through the maze:

https://drive.google.com/file/d/0B10IPmF9qcHUbUcwRGhXR0RqZVk/view?usp=sharing

Objectives: (State measurable objectives in terms of student behavior or performance).

The objective of this project is to teach students computer science and prepare them for future technology projects and careers. Upon completion of this project, students in the lower grades will be able to operate Sphero using the iPad and understand that they can speed it up, slow it down, and control its direction using the different iPad commands. Upon completion of this project, upper grade levels will be able to create macros to program Sphero to make its way through and around obstacle courses, and the students participating in enrichment will be able to build their robots and program them. All students will understand how the commands they give to the robot through the program affect its movements, and they will be able to problem solve when the robot does not do what they expected.

This project will address our technology Texas Essential Knowledge and Skills or TEKS.
Standards addressed for Kindergarten-2nd grade:
(1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products.
especially this task: (C) explore virtual environments, simulations, models, and programming languages to enhance learning
Standards addressed for 3rd and 4th grade:
(1) Creativity and innovation. The student uses creative thinking and innovative processes to construct knowledge and develop digital products
(4) Critical thinking, problem solving, and decision making. The student researches and evaluates projects using digital tools and resources.

Need: (Describe the area of student achievement you wish to address and give any data that supports the need. Please include how this grant addresses district and campus goals).

Computer Science is one of the fastest growing industries, and as educators we are not adequately prepared or funded to teach students how to be programmers and keep up with this trend. According to code.org, in the U.S. there are 586,107 computer science jobs available and only 38,175 computer science graduating students. In Texas alone there are 43,744 jobs with 1,813 graduating students. These jobs aren't only in tech companies but banks, retail, government, etc. Computer programming can be used in architecture design, tracking of materials, game and computer software development, and an endless other number of opportunities. You can read more about stats at https://code.org/promote. This grant will allow Aledo elementary students to develop a passion for computer science from an early age. I'm hoping that my students will claim some of these high-paying technology jobs that are available and possibly create jobs that we haven't even thought of yet.

According to our 2015-2018 Aledo Strategic Plan, we have several goals that this program will address.
Learning 1.2- The district will provide a variety of diverse, rigorous courses and programs/pathways to meet student needs and prepare them for the future to be successful in a competitive-global society.
Learning 1.4- The district will provide a variety of co-curricular and extra-curricular activities for the enrichment of all students.
Learning 1.6- The district will increase the opportunities for all students and staff to use developmentally appropriate technology in creative learning environments.

It will also address our campus goal to develop responsible digital citizens that use technology to advance their learning and our goal to develop partnerships with our parents and community.

Evaluation Strategy: (Describe how you will know if your objectives are met. How will you share your program's successes with your peers)?

I will know if students have met my objective if Kindergarten through first grade can operate the Sphero using the iPad and explain what commands they give to move Sphero the way they want. For second through fourth grade, I will expect them to be able to program Sphero and make it move thorough obstacles they create using ramps, cardboard or other available building materials from our makerspace. I will be able to make these observations as students visit the library each week. If students do not understand how to complete the objectives I will allow students that have mastered it to teach them. I will also use a Google form to survey second through fourth grade about what programming tasks they feel confident in after using the robots. They will be able to complete the short surveys during library time, and I will have immediate feedback.

I will continually share the program with all of the library's stakeholders through our library Facebook page. I will also be able to share with other librarians during our monthly librarian meetings.Our students can be leaders that are taking their knowledge to other campuses both inside and outside of our district. They can present what they have learned by doing Google Hangouts with other schools, creating videos using our library green screen room, or creating digital products using the iPads that can be uploaded to Facebook or the website to promote the program.

Partners: (Identify any school and/or community partners involved in the project and their respective roles).

I will reach out to other elementary technology groups in our area to see if they will communicate via Google Hangouts to discuss our projects. I would love for students to learn from and teach other students about their ongoing projects. I also have had a father of a current student commit to speaking to students about how he has used coding as a Director of IT and the power of technology in his architecture and engineering firm. His fortune 500 company was involved in the building of the World Trade Center memorial where they used technology such as augmented reality during the design process. I'm hoping that by promoting our programming projects through our Facebook page and website that we will find more partnerships to bring professionals to speak to our students.

Sustainability: (If funded, how will you continue the program/project in the future? What will be the recurring costs? How will this program/project be funded in the future)?

The robots will last from year to year and they will work with IOS or android devices using free apps. This means we can use our school iPads (we have 2 carts of 22 iPads), or students can use their own device.

Budget Worksheet

DIRECTIONS: Note the budget distribution for each category. Be specific.

Budget Items	Amount	Vendor	Budget Code Business Office Use
Equipment			
Spheros- 10 ($129.99 each) http://www.amazon.com/Sphero-2-0-App-Enabled-Robotic-Ball/dp/B00F35P69C/ref=sr_1_2?ie=UTF8&qid=1442935129&sr=8-2&keywords=sphero	1299.90	Amazon.com	
Orbotix Nubby Cover (alllows Sphero to be "all terrain")- 10 ($14.99 each) http://www.amazon.com/Orbotix-Nubby-Cover-Retail-Packaging/dp/B00GOJR4AU/ref=sr_1_12?ie=UTF8&qid=1442935324&sr=8-12&keywords=sphero	149.90	Amazon.com	
Dot and Dash- 2 ($249.99 each) http://www.amazon.com/Wonder-Workshop-Dash-Robot-Pack/dp/B00QKFFN3I/ref=sr_1_1?s=toys-and-games&ie=UTF8&qid=1442244067&sr=1-1&keywords=dot+and+dash	499.98	Amazon.com	
MakeBlock- 5 ($97.95 each) http://www.amazon.com/Makeblock-Educational-Robot-Bluetooth-Version/dp/B00SK5RUQY/ref=cm_cr_pr_product_top?ie=UTF8	489.75	Amazon.com	
TOTAL	2439.53		

Grant Applications should be submitted to AEF electronically. *Email application as an attachment to* Lynn McKinney at lmckinney@aledoisd.org. Do not submit hardcopies of

grants. *Include the Cover Page with appropriate approval signatures as an attachment separate of the Grant Application.***A**

Aledo Education Foundation
Criteria for Grant Approval Reviewer Score Sheet

Application Number Evaluator #

Project Title _____

Please rank the effectiveness of each item with 5 being high and 0 being low. Circle the number that best describes each statement.

Criteria							Weighted Amount	Weighted Total
Need is clearly stated. Supports districts and campus goals.	5	4	3	2	1	0	X 4	
Objectives are specifically stated and measurable.	5	4	3	2	1	0	X 3	
Activities/procedures specifically stated and relate to purpose and objectives. Innovation is apparent.	5	4	3	2	1	0	X 4	
Evaluation strategy is clearly stated and relevant to the objectives and student performance.	5	4	3	2	1	0	X 3	
Budget is complete, realistic, accurate and appropriate.	5	4	3	2	1	0	X 4	
Project includes participation and support of parents, community and/or business partners.	5	4	3	2	1	0	X 2	
							GRAND TOTAL	

Please check the statement below that best describes how you would rank this application.

- □ I would definitely recommend funding this project.
- □ I would recommend partial funding. Amount? $ _____
- □ I would recommend funding this project if there were extra money.
- □ I would not recommend funding this project.

Additional Comments (please use back if necessary)