Association for Excellence in Education
2018 - 2019 Grant Application
Cover Page 2

Title of Project:____Code It with a Raspberry Pi(e)_________________________

Curriculum Area/s:__Technology______________________

Grade Level/s:_9th - 12th______ Number of Students Involved:__250_____

Amount Requested:__$2699.70___

Can this project be matched or assisted by other funds? ( )Yes (X)No

If yes, from where and how much?

____

Is this proposal a resubmission of a funded grant written by someone else?

( ) Yes (X) No. If yes, list the name/s of the original grant recipient/s:

____

Is this proposal a resubmission of a grant for which you have received AEE funding? ( )Yes (X) No. If yes, check the appropriate space.

This is second ( ) third ( ) resubmission.

Part1. Complete the Project Description. This maximum **two page** description may be submitted in Word, Pages or PDF format. Use either 12pt. Calibri or Times New Roman font and one-inch margins on all sides of both pages. Any remarks past two pages will not be sent to reviewers. Omit names of grant writers and schools in the description and the budget spreadsheets.

Part2. Complete the General Budget Spreadsheet and the Speaker Budget Spreadsheet, if proposal involves guest speaker.

Part3. Submit the Project Description, the Budget Spreadsheet/s, Cover Page 1 and Cover Page 2 to Ginger Towery at the TPSD Central Office. Proposals must be received on or before the deadline.

Code It with a Raspberry Pi(e)

Overview: A few months ago I purchased a Raspberry Pi, which is a bare-bones, credit card-sized computer. It was developed in the United Kingdom a few years ago to promote the teaching of basic computer science in schools. After owning a Raspberry Pi for a short time, all I could think was "My students need this!" The Raspberry Pi is a series of small single-board computers developed by the Raspberry Pi Foundation to promote the teaching of basic computer science in schools. I want my students to have this opportunity. Many of them cannot afford to purchase a laptop computer, but many more could have access to a $35+ computer.

Need: Young people today need only to press a button or touch an app to access realistic graphics, physics engines, monitor the weather, etc. This has led to a "disconnect between the creator and the user." They can now access complex software and games with only a minimal amount of effort. With an iPad a student cannot look "under the hood to tinker with the settings or modify the code." It appears that this generation of students has no concept of how computers actually work, and this is why the Raspberry Pi is so important to education. The Raspberry Pi "strips back the slick marketing, the shiny cases, and the slick user interfaces of today's computers and allows students to tinker, experiment, and explore. It will pull out those students for whom computing will become a profession, and enlighten those for whom the iPad is a sealed box of magic tricks." The Pi is more focused on hands-on learning, rather than social media, or YouTube. A few of the possibilities of using the Raspberry Pi include: (1) making an old TV into a smart TV (2) streaming web videos (3) serving as a file storage server (4) making an old USB printer into a networked printer (5) extending a home network's range (6) emulating old school gaming (7) streaming music (8) playing minecraft (9) constructing a voice recognition model similar to Amazon Echo which will answer questions (10) networking (11) programming/coding.
To elaborate on the primary reason the Pi was created:
Tim Cook, CEO of Apple, was recently interviewed on NBC News. He said, " Coding trains you to think critically, trains you on problem solving. Coding should be the key second language that everyone should learn. Kids are growing up in a very different world than that of their parents. Cell phones, computers, YouTube, Netflix, and Facebook are embedded in their daily lives. It is one thing to know how to use these technologies, but it's quite another to understand the logic behind them. When learning to program, kids understand and tinker with the digital world they inhabit."
Many students have no idea what makes a computer function because they have never seen the inside of one. Laptops and desktops are too expensive to open up for observation and "tinkering." Other reasons that the Raspberry Pi would work well for my students involve robotics. If we were to construct a flying drone, we would be hard pressed to make it fly with a laptop computer attached to it. The Raspberry Pi lets the user control external devices by means of GPIO pins. The whole programming involves turning "on" and "off" these pins in a manner that it becomes the input for peripherals. This is very difficult with a regular computer. One other advantage of the Raspberry Pi over a regular computer (other than its cost) is its "community." There are thousands of Pi users doing similar projects, and they are great resources.

Purpose/Objectives: The objectives for this grant are the Mississippi curriculum objectives for technology classes which include: (1) Evaluate and resolve computer hardware and software issues. (2) Identify various pieces of hardware and the function(s) performed by each. (3) Differentiate between hardware and software in a computer environment. (4) Identify and describe computer types, purposes, and functions. (5) Identify and describe the internal components of a computer. (6) Identify and describe system resources to include input/output ports, processing, memory and storage. (7) Identify and describe the various peripheral components of a computer. (8) Identify and describe the components of an operating system. (9) Research programming languages. (10) Compare and contrast various programming languages. The Raspberry Pi would meet the needs of my students as they master each of these objectives.

Implementation Plan: My plan to implement this grant will follow in this order:

August/September 2018: (1) Students will use Raspberry Pi's to identify and describe all the internal components of a computer. (2) Students will understand and explain how to network two or more Raspberry Pi's together. (3) Students will program a Raspberry Pi to send messages to another Pi.

October 2018: (4) Students will control hardware over a Pi network. (5) Students will apply basic programming constructs to solve a problem with a Pi. (6) Students will identify and use basic digital, analogue, and electromechanical components with a Pi.

November 2018: (7) Students will combine inputs/outputs to create projects to solve a problem using a Raspberry Pi. (8) Using Raspberry Pi's, students will collaborate on digital making projects with other community members.

In January 2019 I will begin this process of implementation over because my classes are a semester long.

Evaluation: I will pre-test my students to find a beginning point from which to track their progress. They will assess their coding skills and identify possible career goals. I will also periodically test them to make sure they are mastering each objective. At the end of the semester, they will answer the same pre-test questions to let me know if they believe they have benefitted from using the Raspberry Pi's. We will keep a digital record of all the ways they have used the Pi's and what they have learned., thereby documenting the implementation plan. At the end of the year, AEE members and other classes will be invited to visit and see our successes with the Raspberry Pi. (Raspberry Pi Expo) Students will also be comprehensively tested at the end of the semester to show their progress for the entire semester.

Sources:
(1) www.raspberrypi.org
(2) www.classthink.com/2014/08/24/getting-started-with-raspberry-pi-in-the-classroom/
(3) https://www.facebook.com/nbcnightlynews/videos/10156033511808689/

ASSOCIATION FOR EXCELLENCE IN EDUCATION (AEE)

GENERAL BUDGET

WORKSHEET FOR BUDGET DEVELOPMENT

(See Instructions at Bottom of the Page)

GRANT NAME: Code It with Raspberry Pi(e)

PAGE ONE

PAGE 1 OF 3

ITEM TO PURCHASE	QUANITY	UNIT PRICE	TOTAL PRICE	VENDOR	REUSABLE YES	NO
EXAMPLE	1	$2.25	$2.25		X	
CanaKit Raspberry Pi 3 Ultimate Starter Kit 32 GB Edition	30	$89.99	$2,699.70	Amazon	X	
			$0.00			
			$0.00			
			$0.00			
			$0.00			
			$0.00			
			$0.00			
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			$0.00			
			$0.00			
TOTAL PAGE 1			**$2,699.70**			
TOTAL PAGES 1, 2 & 3			**$2,699.70**			

INSTRUCTIONS: Insert quanity in Column B and price for each in Coulmn C. The total will be calculated in Column D.
Indicate if item is reusable by placing an "X" in either Column F or G.

GRAND TOTAL:						

ASSOCIATION FOR EXCELLENCE IN EDUCATION (AEE)

SPEAKER BUDGET

WORKSHEET FOR BUDGET DEVELOPMENT

Grant Name:____

DESCRIPTION	**QTY**	**UNIT PRICE**	**TOTAL PRICE**	
SPEAKER NAME:				
PRESENTATION COST:		$0.00	$0.00	
		$0.00	$0.00	
SUB-TOTAL:			$0.00	
	# OF DAYS	**COST**	**TOTAL PRICE**	
LODGING: (suggested $85.00/night) – must provide signed receipt of district		$0.00	$0.00	
MEALS: (max $6-breakfast, $9-lunch, $16-dinner) – receipt required				
Breakfast-		$0.00	$0.00	
Lunch-		$0.00	$0.00	
Dinner-		$0.00	$0.00	

SUB-TOTAL LODGING & MEALS:			$0.00		
	RATE	**MILES**			
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TRANSPORTATION:					
Automobile-	**0.555**		$0.00		
Plane-		X	$0.00		
SUB-TOTAL TRANSPORTATION:			$0.00		
	QTY	**UNIT PRICE**	**TOTAL PRICE**	**REUSABLE**	
				Yes	**No**
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SUPPLIES: (LIST BELOW)					
			$0.00		
			$0.00		
			$0.00		
			$0.00		
			$0.00		
SUB-TOTAL SUPPLIES:			$0.00		
	QTY	**UNIT PRICE**	**TOTAL PRICE**		
\					
OTHER: (LIST BELOW)					
			$0.00		
			$0.00		
			$0.00		
			$0.00		
			$0.00		
			$0.00		
SUB-TOTAL OTHER:			$0.00		
GRAND TOTAL:			**$0.00**		
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