



This is a highly competitive grant. Only one grant will be submitted from Polk. Submitted grants across the state will be reviewed by an outside review panel before final funding decisions are made.

Grant Applications must be emailed as an attachment to Shannan.combee@polk-fl.net by 5pm EST on or before 9/8/17

****New in 17-18**

- **Projects may ONLY impact middle school through high school students (6th-12th grade).**
- **Bonus Points:** Up to five (5) additional points will be awarded in each area to projects that:
 - Incorporate engineering and/or IT concepts (such as coding, programming and robotics);
 - Incorporate public safety elements;
 - Incorporate vocational skills and/or certification in engineering or IT areas; and/or
 - Target females or specific under-represented groups.

Basic Information	
Foundation Name:	Polk Education Foundation
Project Title:	Powering the Future of STEM
Project Goal:	The goal of this project is to create hands-on learning S.T.E.M. activities and increase workforce awareness of S.T.E.M. careers focused on sources of energy production in Florida: biomass, ocean, nuclear, wind and solar. Students will also explore how electricity is generated and provided to consumers, and interact with diverse guest speakers, engineers, operators, technicians, and more from each of the related industries to help connect them to career potentials.
Project Objective: <i>(Specific STEM instruction goals. What problem will the students address in the project?)</i>	Students will explore how electricity is generated and provided to consumers. Guest speakers from the energy sector: biomass, ocean, nuclear, wind and solar, and related industries will provide students with access to career potentials and guide S.T.E.M. related projects. Students will address and research past, present, and future decisions related to energy shortages. Instruction goals include designing a circuit board and building a miniature house to demonstrate how electricity travels from the power plant to a home; microbit light boxes and utilities packages; solar arduino cars; building a portable, working model of a power grid system that can then be used by other classes and schools to learn about the power grid; electric bracelets and artwork using their new knowledge; exploration of how radiation is created and controlled in a nuclear reaction, disaster preparedness, designing and testing a wind turbine; safe solar viewing, and finally, tracking the sun's path to determine the optimum angle for energy generation by a solar panel. Students will also design a solar panel bank and determine how much water can be pumped over a set period of time using both parallel and series circuitry.
Business Partner Information	
Business Partner Name:	Duke Energy, Florida Energy Systems Consortium

Contact Name:	Jerry Miller
Contact Email:	Jerry.Miller3@duke.energy.com
Type of Industry or Business:	Electric power holding company
School and Teacher Information	
Teacher Contact:	David Lockett
School Name:	Bok Academy
Grade Levels to be Addressed (<i>ONLY grades 6th-12th may apply</i>):	6-8
Academic Subject:	Engineering, IT, Robotics, STEM
Teacher Email:	David.Lockett@lwcharterschools.com
Student Information	
Target Group of Students:	The project is aimed especially at serving student groups underrepresented in the STEM fields, such as African-American, Hispanic, female, and low-income students in rural areas.
Number of Students: (<i>Minimum of 100 per project</i>)	175
Number of Teachers:	2
Projected Project Completion Date: (<i>Final reports are due April 6 2018</i>)	March 2018

Project Detail (Be Specific)	
Curriculum Plan and Goals	
<ul style="list-style-type: none"> Describe your project plan <u>in detail</u> that includes a description of student / business partner interactions. 	<p>The set of 21st-century challenges and workforce development, serves as a frame and inspiration for "Powering the Future of STEM". At a time of heightened national attention to improving education in the fields of science, technology, engineering, and mathematics, workforce development is gaining momentum as a strategy to boost knowledge and interest in the subjects.</p> <p>In a project-based learning environment "Powering the Future of STEM" students will take part in unique hands-on projects with community partner Duke Energy. Business partner Duke Energy will provide diverse guest speakers, engineers, operators, technicians, and more from each of the related industries to help students connect to career potentials. Duke Energy will also provide plant tours, site visits, and introduce students to the high-tech world of energy. Students will explore, investigate and answer key questions about all aspects of energy. Answering questions including: What is energy? Where can we find energy? How do we use it and what would our life be without it?--are just a few of these questions and challenges addressed. In the field business partner Duke Energy will demonstrate how to use knowledge, skills, and better practices relating to energy conservation.</p>

	<p>The projects includes both generating and consuming energy. The highlight of the project, a mini-grid includes working outlets where students can plug in devices and monitor system-wide changes. The mini-grid will also be used to demonstrate alternative energy sources, including solar, human, wind and propane generators. Because the power grid is a working model, students also learn how to monitor consumption and manage voltage for greater efficiency. Students study how energy is produced and creative ways to use electricity. Hands-on projects include designing wind turbines and studying circuitry. Students create electric bracelets and artwork using their new knowledge. An electricity art show in March will include a fashion show for the bracelets and an art display.</p>
<ul style="list-style-type: none"> Please list your planned milestones with dates for this project. <i>(Please note dates and times that will fulfill the 20 on-site, contact hours requirement)</i> 	<p>October: Pre-test survey and orientation to renewable and nonrenewable energy.</p> <p>October: What is energy literacy? Guest speaker and demo.</p> <p>October: Duke Energy visit energy demo</p> <p>October: Begin the "Powering the Future of STEM" unit.</p> <p>November: Purchase kits, materials, and projects for the unit.</p> <p>November: Demonstrations: Alternatively Fueled Vehicles</p> <p>November: Duke Energy Demonstration houses.</p> <p>November: Microbits lightboxes projects</p> <p>December: Duke Energy Disaster Preparedness.</p> <p>December: Solar energy and viewing demos.</p> <p>December: Solar cell arduino projects.</p> <p>January: Duke Energy solar power site visit.</p> <p>January: Nuclear engineer visit.</p> <p>January: Solar grid projects.</p> <p>February: Build and Test solutions. Recording process and progress in Notebooks.</p> <p>March: Presentation/ Evaluation of Projects. Post-test Survey and Conclusion.</p> <p>March: Evaluation and planning for next year project.</p>
<ul style="list-style-type: none"> Will you have a matching contribution for this project? 	<p>At this time there is no matching contribution for this project.</p>
<ul style="list-style-type: none"> Project Abstract <i>(Describe in 200 words or less your project proposal and outcomes to be measured. This will be submitted to the funder. Think: If in an elevator with this funder, what would I say about this project and its potential impact?)</i> 	<p>Students will learn about where their electricity comes from, the difference between renewable and nonrenewable energy sources and the impacts they have on our environment. Using the engineering design process, students will then design, build, test, evaluate and redesign S.T.E.M. related projects through the exciting world of energy. Students will start the journey by learning about what energy is, the different forms and how it is transformed from one form to another. They will also investigate the various methods energy is used, both natural and</p>

	<p>man-made processes in the field with Duke Energy. Finally, the journey concludes with how the world is impacted, both positively and negatively by our energy use.</p> <p>Students will discover the environmental impacts of energy production in the region. Students will also be exposed to career opportunities in the energy and engineering fields, while conducting controlled experiments to reinforce the concepts of energy transfers/transformations and energy conservation.</p>
<ul style="list-style-type: none"> ● Bonus Point Opportunity: Does the project incorporate engineering and/or IT concept (such as coding, programming and robotics)? If so, how? 	<p>The study of engineering and the use of the S.T.E.M. process is a great educational pursuit. In it, students apply various disciplines toward a common goal. While “education for the purpose of enlightenment and eventual application in life is admirable, education for application now, to everyday life and its problems, can move the student to a different level and hopefully to a deepened perspective which can be applied to all educational pursuits.</p> <p>This project is a proposal to use the S.T.E.M. platform and process for understanding the S.T.E.M. workforce in the community. We will use the phrase “Real World Problem” to emphasize the application to an everyday need. In order to do this, we are asking for equipment and supplies to fuel this process. Students will learn key S.T.E.M. concepts about circuits, programming, and engineering with Tesla Kits, augmented reality, solar invention kits, alternative energy robot kits, and physics kits showcasing solar arduino technology.</p>
<ul style="list-style-type: none"> ● Bonus Point Opportunity: Does the project incorporate public safety elements? If so, how? 	<p>Energy is used in many different ways to improve life. But with it comes a unique assortment of potential hazards that can affect you no matter where you are or what you're doing. So whether you're painting a house, turning on an oven, operating machinery or taking a boat cruise, practicing safety around electric, solar, and gas systems is paramount. Students will learn best practices designed to raise awareness about safety and potentially hazardous situations. This will in turn improve the integrity and reliability of our energy infrastructure. Best practices include: safety planning, design and construction, and enhanced training programs.</p>
<ul style="list-style-type: none"> ● Bonus Point Opportunity: Does the project incorporate vocational skills and/or certification in engineering or IT areas? If so, how? 	<p>Vocational skills to be developed for the energy sector need to cover a range of different aspects of the value chain of energy projects, depending on the choice of technology. The required skills vary greatly from sector to sector, as do the level of training and education. There is plenty of scope for continuing and deepening exchanges of knowledge and experience among countries on training and skills development policies and systems. It is particularly valuable for those in the field to share their experiences in dealing with the more difficult challenges of maintaining the relevance of education and training to the world of work, and in moving from policy principles to application.</p>

<ul style="list-style-type: none"> ● Bonus Point Opportunity: Does the project target females or specific under-represented groups? If so, how, and what makes this group under-represented in your district? 	<p>A focus on engagement and participation of girls and students from underrepresented minorities, and rural communities is the project focus. The project aims to increase knowledge of how to prepare for a career in S.T.E.M., and/or understanding of the career possibilities within S.T.E.M.. Building S.T.E.M. identity in girls with an innate sense of belonging and connection to S.T.E.M. is crucial. The targeted group is underrepresented in STEM related studies and professions, with only one in four IT graduates and fewer than one in 10 engineering graduates are women.</p>	
<ul style="list-style-type: none"> ● How will you share project photos and impact stories to the PEF and general public throughout your project period? 	<p>From a community standpoint, we will share project assembly with students, teachers, schools, and the local community on school web sites, social media outlets, and within various media, print, and news outlets. We will also share photo(s), media, with system side media blurbs provided by Brian Ackley, PR for Lake Wales Charter Schools.</p>	
<ul style="list-style-type: none"> ● How will you recognize PEF, CFEF and Motorola if your grant is awarded? 	<p>We will build capacity and sustainability by designing a program that can be repeated and improved each year with a new set of students. As the energy projects conclude and the students dismantle their project prototypes, the energy kits and parts will be stored for use again next year. This will in turn spark renewed interest in Coding, IT, and STEM projects and reinforce the importance of 21st Century learning.</p>	
<p>Outcome Measures: Please <i>DO NOT</i> submit applications that are not able to measure <i>ALL</i> the following, including STEM-subject grades. These grades can be from a project-specific test, not necessarily from classroom or FSA grade.</p>		
<p>You will be REQUIRED to report on ALL the following outcomes. How will you measure and report on these?</p> <ul style="list-style-type: none"> ● Number of students who show increased interest in taking STEM classes in future ● Number of students who show increased interest in pursuing a STEM major ● Number of students who show increased interest in pursuing a STEM career ● Number of students who increased STEM-subject grade by at least one full letter grade ● Number of students who increased STEM-subject grade by half letter grade (e.g., from a B- to B) ● Number of students who showed no increase in STEM-subject grades 		
<p>Budget: (\$5,000 per project)</p>		
<p>Please provide a detailed budget of how you will be utilizing the funds. Applications without budget information provided will not be accepted.</p>		
<p>Expense Category:</p>	<p>Amount:</p>	<p>Reason:</p>
<p>Program Materials (Consumable)</p>	<p>\$1000</p>	<p>20-Thames and Kosmos Physics Kits 20-ArcKit Model Kits Items will enhance teaching and learning in S.T.E.M. workforce development.</p>
<p>Program Materials (Non-Consumable):</p>	<p>\$2500</p>	<p>15 -Solar City Models 20-Solar Lab Electricity Kit 4-Celestron 21035 70mm Travel Scope</p>

		10- Hover racer kit 10-Celestron EclipSmart Binocular 20-Ecocity green solar Science Projects 20-Working Models - DIY Science Experiment kit 20-Elenco Captain Roam EO Building Model Kit 20-Elenco Astronaut Sun Power Kit 20-Elenco Photon Solar Racer Kit 15-Microbit project connectors Reusable non-consumable items will help to restructure S.T.E.M courses and better assess project outcomes.
Transportation:	\$1000	Round trip transportation to Disney PhotoVoltaic Project site, Duke Energy Lake Wales site visit, electric and nuclear safety site visit.
Program Implementation (not to exceed \$500):	\$500	Administrative Fees
Teacher Stipends/ Substitutes:	\$0	
Other (please specify expense):	\$0	
Agreements		
<p>I, David Lockett (type name in box), understand and agree to the following terms for these grant funds. (Please place a check next to the following statements to signify agreement to comply with the terms)</p> <p><input checked="" type="checkbox"/> If my application is chosen as PEF's submission, I understand that my application may be competitively judged by an outside review panel.</p> <p><input checked="" type="checkbox"/> I understand that this funding is to be used for a <u>new</u> project OR expansion of an existing STEM education program.</p> <p><input checked="" type="checkbox"/> I understand that if my project will not be completed as outlined any unused funds must be returned to PEF by February 15, 2018.</p> <p><input checked="" type="checkbox"/> I understand that a final project evaluation report must be submitted by April 6, 2018, and that if it is more than 5 days late my school will forfeit participation in future opportunities for this or similar grant programs. In some cases, grant funds may have to be returned to Polk Education Foundation.</p> <p><input checked="" type="checkbox"/> I have shared this grant proposal with my administrator, Dr. Damien Moses and Mrs. Metta O'Bryant , and I have received approval for submission.</p> <p>Completed applications must be emailed to shannan.combee@polk-fl.net by 5pm EST on 08/31/16. If you have any questions, please contact Shannan Combee at 863-534-0803 or Shannan.combee@polk-fl.net.</p>		