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School Name: Milwee Middle
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Address:
City: Longwood
State: FL
Zip Code:
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Contact/Title: John Kallin
Years of Teaching Experience: 18
Contact/Title: Carol Unterreiner
Years of Teaching Experience: 19
Contact/Title:
Years of Teaching Experience:
Contact/Title:
Years of Teaching Experience:
Contact/Title:
Years of Teaching Experience:
Student Grade Level(s): 7-8
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Email Address: John_Kallin@scps.k12.flus
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Grant Catagories: Mathematics Science Technology
Received Funds:
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Project Title: Solar Energy - Ride the Wave
Expected Date of Implementation: April 2014
Number of Students Participating_Impacted: 200
Low Performing Students: 30
Statement of Need: Milwee Middle School is a Title 1 school with an economically disadvantaged population of 64%. We have an ESE population of 20.45%. Programs such as these allow students to access information and ideas that they would not often encounter otherwise. Furthermore, this unit will be able to help students make future energy choices that are wise economically and environmentally.
Statement of Need: HighRisk
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Program Summary: During this unit students will explore solar energy as an alternative to

nonrenewable energy sources - particularly fossil fuels. Students will learn about the environmental benefits of solar energy in terms of its ability to positively impact such global issues as climate change, ecological footprints, poverty, and social justice. They will begin by learning about foundational scientific concepts such as the electromagnetic spectrum, energy types, energy transfer, and energy sources. They will debate the advantages and disadvantages of increasing the use of solar energy to meet the growing demands of Floridians. Students will be able to explore how solar can be used as a practical energy source by designing and building their own solar cars and solar ovens. Using data from these activities students will be able to draw important conclusions about the usefulness and limitations of solar energy in Florida.

Program Goal(s): Goal 1: Students will understand that solar energy is an inexhaustible and environmentally friendly energy that can be converted into several other useful forms of energy. Goal 2: Students will be able to effectively apply their knowledge of solar energy and the engineering design process to create objects that will function using solar power.

Goal Objective 1: 1. The students will be able to explain how the radiant energy is converted to other forms of energy when it is reflected or absorbed by objects in its path. 2. The students will be able to describe the characteristics of solar energy and how it can be transformed into useful heat energy, electrical energy, and mechanical energy.

Activities 1: 1. Discuss and view the electromagnetic spectrum with spectroscopes and flame tests. 2. Types of Energy exploration. 3. Solar Energy Webquest. 4. Student debate on solar energy as an alternative energy source. 6. Guest speaker from local solar company, Solar Solutions.

Goal Objective 2: 1. The students will be able to design, test, and build a working solar oven. 2. The students will use the Green Car computer simulation program to design and test a solar car and, upon completion, construct and race their car.

Activities 2: 1. Students will use the engineering design process to create a solar oven which they will use in a cooking competition at school. 2. Students will use the Green Car simulation program to engineer a functional solar car. 3. Students will construct their car. 4. Students will race their car. 5. Students will attend the Energy Whiz Olympics in Cocoa Beach, May 3, 2014.

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Student Outcomes: Students will understand that solar energy is a viable, clean alternative energy source.

Objective 2: Students will be able to describe some practical applications of solar energy.

Evalualtion: Students will be evaluated by us and by themselves according to a scale we created describing their levels of learning. We will evaluate students using their written work and their final project, including their design project report (their levels on the solar scale). Students will

take a pre-test and a post-test to demonstrate how they learned through the unit.

Continuation: We plan to continue this project as a built-in unit in several of our 7th and 8th grade engineering classes. We are in a business partnership with Solar Solutions and they are very excited about helping us promote solar energy awareness with our students. We are also continuing to pursue partnerships with other businesses and local educational institutions.

Other Information:

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Budget Description Form

Classroom Description: 12 Packs Black Construction Paper - 3.29 ea = $39.49 10 Rolls Masking Tape - 2.60 ea = $26 6 Boxes Plastic Wrap - 2.24 ea = $13.44 2 Boxes Aluminum Foil - 25.46 ea = $50.92 2 Cases of Pizza Boxes - 22.08 ea = $44.16 2 Boxes of Craft Sticks - 2.64 ea = $5.28 4 Boxes #12 Paintbrushes - 2.02 ea = $8.08 4 Reams of 3-hole Copy Paper - 3.07 ea = $12.28 1 Pack of Styrofoam Cups - 13.32 ea = 13.32 20 Packs of Hot Glue Sticks - 1.99 ea = $ 39.80 10 Packs of Aluminum Tape - 7.88 ea = $78.80 10 Furring Strips - 1.25 ea = $12.50 3 Insulation Boards - 10.95 ea = $32.85 4 Packs of Weather Stripping - 3.98 ea = $15.92 1 Sandpaper Pack - 14.97 ea = $14.97 2 Plexiglass Sheets (36 x 48) - 34.98 ea = $69.96

Classroom Description Amount: 477.77

Program Supplies: Energy Whiz Olympics Bus Transportation = $450

Program Supplies Amount: 450

Computer Software: Green Car 2.0 Whitebox Learning License = $375

Computer Software Amount375

Computer Hardware:

Computer Hardware Amount:

Other Equipment: 2 Flame Test Kits - 24.00 ea = $48.00 3 Packs Ray Catcher Solar Car - 160 ea = $480 50 Competition T-shirts - 10.00 ea = $500 20 Solar Bugs - 2.00 ea = $40.00 2 Noncontact Infrared Thermometers - 45 ea = $90 2 Hot Pad Packs - 6.35 ea = $12.70 2 Pyrex Dishes (rectangle) - 11.41 ea = $22.82 2 Pyrex Dishes (round) - 18.94 ea = $37.88

Other Amount: 1231

Printing: 1000 Copies - 0.014 ea = $140

Printing Amount: 140

Shipping:

Shipping Amount:

Vendor Information:

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Total: 2673.77
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