

Opportunity Statement

Students from Frank School will greatly benefit from the energy education program that can be provided to them with support of the SRP Learning Grants. Students of all grades will be able align new learning about renewable sources of energy with the new Arizona Science Standards. In two years, science will be added to the AIMS (Arizona Instrument to Measure Standards) test and investigating uses of renewable resources will lead to a better understanding of the inquiry process in Strand 1. On a larger scale, the opportunity to educate students will create an awareness of the importance of conserving energy and becoming responsible users of energy that will impact our society. Students will also align learning with Strand 5's Physical Science. This learning will also be aligned with Strand 3 of the Arizona Science Standards, which discusses Science in Personal and Social Perspectives. I also want to instill the significance of continuing education in this area and promoting careers for boys and girls in the areas of math, science, and technology that will improve and make energy more efficient in our society.

In today's society, it is vital to educate students on using energy efficiently and making them aware of alternate uses of energy. My principal, [REDACTED], saw the need to create a new position for me as a Math/Science Coach of Frank School. One of my goals is to make a difference in students' lives by facilitating education on the values of renewable energy sources and how they are cleaner and practical alternatives to nonrenewable resources. Students will utilize the use of technology to learn about the effects of energy conservation and explore and use the scientific method to understand energy sources that are obtained from the sun, water, and the wind.

Students will learn about solar energy and how its efficiency is affected by design and weight. They will use the inquiry process to construct models that use solar energy. Models will include:

- Cars powered by solar energy
- Solar paneled homes
- Solar ovens
- Solar fountains

Students will also discover wind as a valuable source of energy. They will use the inquiry process with the design process to integrate science, math, and technology to construct windmills. They will begin with very basic materials such as cups, tubing, index cards, etc. to introduce the science concepts of force and motion that will be organized around the big idea of energy transformation. Through scientific inquiry, they will engineer windmills that can lift more weight.

Students' awareness of renewable energy resources will offer the opportunity to value available sources of energy throughout their lives that will help to improve our environment.

Project Description/ Timeline/ Measurement Methodology

This will be an ongoing education program from year to year. Different projects will be offered at different grade levels according to level of difficulty. This project will allow students to be involved in fun, relevant learning activities that support and expand on the standards-based curriculum. The primary grades will explore designing solar ovens and making models of solar homes that provide heat and warm water. They will work through

the scientific method to show results and make conclusions. They will also use technology such as the Graph Club to make a graph of temperatures. The intermediate grade levels will design solar cars, make a solar fountain, and make windmills.

There are 30+ classes that I will be able to go into throughout the year and promote the inquiry process. I would also like to have an after school Science Club that would allow for more comprehensive learning.

Student Impact

These activities on renewable energy will have a significant impact on student learning. Hands-on activities to build solar ovens, solar cars, solar fountains, and windmills will create a better understanding of transforming energy and will lead to real life applications of alternative uses of energy in future years.

Creativity

Students have the opportunity to not only be creative with their projects, but to make sure that their creativity will optimally lead to a project with the best performance. For example, they will investigate, create, and modify a solar car to find out what makes it go faster, investigate how to create a solar oven to generate the most heat, and find out what will make a windmill pick up more weight.

Promotion Opportunities

Throughout these activities, I will promote Arizona Standards that are being integrated. I will also use this new learning to promote the value of education in science, math, and technology that will lead to exciting career opportunities. I will look for people with careers related to renewable sources of energy that can come to speak to the students and for field trips that students can go on that are related to solar energy.

Sustainability

Sustainability is very high considering that our main sources needed to run the projects are renewable- sun and wind! Many materials that are purchased, such as solar panels, windmill models, etc. can be used year after year. We also want to build a school fountain that will run on its own and only need solar panels that will keep it running- it will be able to sustain itself.

Evaluation Process

The Scientific Method will be used to evaluate student learning that takes place. Students will identify the purpose of their investigation, make a hypothesis, identify materials needed, write the procedure, record results through pictures, bar graphs, etc., and draw conclusions about their learning and explain how it can be applied to real life situations.

Community and Parent Involvement

We have Honeywell Mentors who come and teach after school clubs. I would like them to come and be involved in teaching a Science Club on renewable energy resources. Many of the Honeywell employees are engineers and they could promote engineering careers to these students.

I would also like students to get involved with going on field trips to SRP or have SRP employees come out and speak about how they are involved with using renewable resources. Our school is a Title I school and most students come from homes in which parents have an education no higher than high school. I would like to create the awareness in students about exciting job opportunities that are available if they do well in science, technology, and math.

I would like to involve parents and the community by asking for volunteers to help build a school fountain that would run itself on solar energy that would educate the students and beautify the school grounds.

There will also be a yearly Math/Science Family night where the community will come to get involved with projects made by the students. There will also be hands on activities offered to create more awareness on renewable energy.

Students will also educate each other by recording results of investigations through mediums such as Imovie and Powerpoint and present the importance of energy education on morning announcements and show the videos and/or PowerPoint presentations to parents.

Budget

Solar Experimenter's Kit	30 @ \$11.95 each	\$358.50
Solar Ovens	6 @ \$41.50	\$249.00
Solar Electric House Kit	5 @ \$29.95	\$149.75
Sunpower House	2 @ \$47.50	\$95.00
Comprehensive Solar Energy Kit	1 @ \$180.50	\$180.50
Solar Energy Kit	15 @ \$19.95	\$ 299.25
Solar Science kit	28 @ \$10.00	\$ 280.00
Mini Panels Encapsulated Solar Cells	28 @ \$18.00	\$ 504.00
Photon Solar Racer kit	28 @ 21.89	\$ 612.92
Photocell testing Kit	10 @ \$52.00	\$520.00
Solar Kit Motor with ring connectors	30 @ \$ 1.95	\$58.50
Solar Cell Demonstration	2 @ 22.50	\$45.00
Sun-lite Solar Science Lab	6 @ \$24.95	\$149.70
For Solar Fountain:		
Siemens M55 Module(used)		\$200.00
Pond linear material		\$65.00

Mount Materials and hardware		\$25.00
Rule Pump		\$20.00
Copper plumbing, _”		\$20.00
Wire		\$20.00
Wind Energy Getting started Package for 25 students		\$439.00
Rotor Kit	5@ 29.00	\$145.00
Sun Tracker	1 @ \$195.00	\$195.00
Solar Powered Models	5@ \$45.00	\$225.00
Grand total		\$4856.12