Alternative Energy Resources

NDIA Grant Summary - Navarre High School

I would like to thank you the funds to help study alternative energy resources. This project is and will be ongoing. The money was used to purchase wind turbine and hydrogen fuel cell kits. The wind turbine kits allowed students to determine blade shape, pitch, and number of blades to determine how to produce the highest amount of electricity. Once students determined the best set-up, they compared this method to hydrogen and solar power. To use the hydrogen fuel cells, students learned they needed to use an external fuel source to generate hydrogen. I was able to purchase hand-crank electrical generators. Students had to attach the fuel cell to the generator and crank. This process split water used in the cell into hydrogen and oxygen. Each method of electrical generation was hooked to both a current and voltage probe. Students calculated power output and compared the 3 types of alternative energy sources

Here are some lessons students learned this year….

- Students learned that while hydrogen is a very effective fuel source to generate power, its main drawback is hydrogen needs a fuel source to split it from water. Once hydrogen was generated, it generated the most power. However, the net gain of energy is lower the other two forms.
- Wind power is extremely efficient but is limited to location. Wind turbines required an average wind speed of 10mph to be useful. Not all locations have this requirement.
- Solar like wind is effective but solar panels themselves are inefficient and location is very important. While there is solar energy everywhere, the shape of the earth does not distributed solar energy evenly. Solar panels are also very expensive, so not everyone is able to purchase them.

I think this project was a success and I look forward to finding new ways to implement this equipment into different lessons. The pictures attached show the students using the wind turbine and fuel cell. In the first picture, a student is taking current readings to determine power output. In the second picture, the girls are using the hand generator to split the water into hydrogen. They hooked the fuel cell up to the probes to determine the power output.