

Exploring Alternative Energy Sources

Students learned how to work cooperatively in groups while doing hands-on inquiry based learning. This project can easily be duplicated. Teachers can purchase the equipment and have the students determine which alternative energy source is best suited for their climates and locations.

Curriculum/State Standard

New Mexico Science Standards are:

1. Unifying Concepts and Processes: Students will understand the physical world through the concept of change, equilibrium, and measurement
2. Unifying Concepts and Processes: Students will use evidence, models, and explanations to explore the physical world
3. Science as Inquiry: Students will acquire the abilities to do scientific inquiry
4. Physical Science: Students will know and understand the concepts of energy and the transformation of energy
5. Technology and the History of Science: Students will know and understand the differences between the interactions of science and technology
6. Technology and the History of Science: Students will know and understand the impact between science and technology in society

7. Science in Personal, Social, and Environmental Perspectives: Students will know and understand the relationship between natural hazards and environmental risks for organisms

Overview

The project was to compliment a unit on electrical energy by giving students an opportunity to inquire into alternative energy sources such as wind energy, solar energy, and hydroelectric energy. They created models, researched, and shared with their classmates the advantages and disadvantages of the different alternative energy source.

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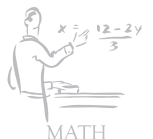
GRADE LEVEL



ARTS



LANGUAGE



MATH

Misc

MISCELLANEOUS



SCIENCE



HISTORY



SOCIAL STUDIES

4

WEEKS

\$1000

TOTAL BUDGET

"Exploring Alternative Energy Sources" project continued...

Objectives

- The students will compare various sources of energy for generation of electrical power.
- The students will construct alternative energy models.
- The students will calculate energy requirements for each model.
- The students will research the benefits and disadvantages of various sources of energy.
- The students will question, think, and apply what they learn to new situations.
- The students will utilize technology in the learning process.

Materials

Power Starter Kit from PITSCO - Partners in Innovative Education; Renewable Energy Set; capacitor; solar cell; activity pack for Power Starter Kit; activity pack for Renewable Energy Set; spring scales & weights; meter sticks; water; fan; light; board for a ramp

Readiness Activity

In January students learned about electrical energy. Students constructed simple complete circuits, then series and parallel circuits, which included doorbell buzzers and circuit breakers. They also studied and constructed a model of an electric motor using paper clips, magnets, wires, and a battery.

Using the electrical energy knowledge as a base, students learned about types of fossil fuels, where they were being produced as well as consumed. They also studied the benefits and disadvantages of using fossil fuels. From there, "Exploring Alternative Energy Sources" project began.

Strategies/Activities

In Science

- Teach students about electrical energy - allowing students to create circuits
- Instruct students about the different types of fossil fuels and the advantages and disadvantages of using them
- Have students take a pre-test on alternative energy sources
- Provide resources (Internet, books, magazines, etc.) for students to research different types of alternative energy sources such as solar energy, nuclear fusion, nuclear fission, wind energy, hydro energy, biomass, geothermal energy, tidal energy, etc.
- Develop lab sheets for students to record their data on their alternative energy models - (e.g. record how much weight was lifted in Newtons for a waterwheel)
- Have students teach their peers about the advantages and disadvantages of the different alternative energy sources
- Have students take a post-test on alternative energy sources
- Tour a dam or a solar energy facility if possible

Culminating Activity

To culminate the project, a guest speaker from New Mexico State University came in and spoke to students about energy. The students also visited the Biosphere II in Tucson, Arizona, which uses solar energy to run part of the facility.

Evaluation

Students were evaluated using written pre- and post-test scores, first looking at growth scores and then final performance scores. They were also assessed on the lab activities - determining how much weight was lifted, work that was done, energy gained, etc., with their models. Students also evaluated themselves and their team members on cooperativeness, attitude, use of time, and completion of jobs. As a final assessment, the students presented an oral report to the class on the benefits and disadvantages of an alternative energy source.