

Solar Collector: A Lesson Plan & A Blog WebQuest



Ohio Standards - (with my annotations)

- Science (Grade 6) -
 - Physical Science
 - Explain that energy derived from renewable resources is assumed to be available indefinitely. (*from textbook*)
 - Science & Technology
 - Explain how decisions about the use of products and systems can result in desirable or undesirable consequences. (*after finishing, compare solar energy to nonrenewable resources*)
 - Design and build a product or create a solution to a problem given one constraint (environmental effects). (*how does technology like solar collectors reduce environmental pollution?*)
 - Scientific Inquiry
 - Distinguish between observation and inference. (*Students observe temperature increase and then make inferences about hypotheses*)
 - Explain that a single example can never prove that something is always correct. (*test the solar collectors over two days*)
 - Scientific Ways of Knowing
 - Describe why it is important to keep clear, thorough and accurate records. (*students can repeat other students' experiments*)

Materials & Technology

- Links to the following websites - [Energy Story](#), [Solar Cooking Plans](#), [Catching Sunshine](#)
- Blogs w/[WebQuest](#)
- [Materials](#) for solar collectors
- [Digital Camera](#)
- [Spreadsheet](#) Software

Background

The webquest portion of this lesson replaces the traditional mode of introducing a classroom project to students. Typically, I type up a handout that lists the requirements and a scoring guide and go over it in class. Students will learn about all of this and more through the WebQuest.

The project students will be working on is creating a [solar collector](#) (or cooker or oven). The goals of this project are:

- Through [project-based learning](#), the kids discover how scientists harness the sun's energy and use it as an alternative to nonrenewable resources.
- The kids develop hypotheses about:
 - how the colors and textures that line the inside of the collector affect the temperature increase.
 - how to point the cooker to achieve the greatest temperature increase.
 - how to insulate it to achieve the greatest temperature increase.

- Students use technology (blogs) to:
 - research information about solar energy.
 - find out how to build the solar collector.
 - communicate with their teacher about learning, collector designs and materials, and more
 - to create a line graph of collected data



Procedure

1. (Day One) Introduce students to the terms resources, nonrenewable resources, and renewable resources. Make sure students are aware of examples for each. Finally, discuss benefits and drawbacks of each type of resource. I did this through the textbook.
2. (Day Two) Begin WebQuest. Students should complete the first two sections of the WebQuest (*Introduction & Task*) and communicate their learning to the teacher through the comment link. In this section, students learn about solar energy and how it is used to create electricity. They also learn about various solar cooker designs and the materials used to create them.
3. (Day Three) Students read and complete step one in the process section. In this section, they learn about the science behind how the solar collector works. They also get into more detail on the designs and materials needed. Students should have an idea of what design they want to use before the end of day three. In fact, their assignment is to decide on a design and: draw a picture of it, list the materials needed, and write down three questions they expect to answer from it.
4. (Days Four & Five) Students construct their solar cookers.
5. (Day Six) Students begin testing their cookers. Before doing so, they choose one of the three questions they asked earlier and turn it into a hypothesis. They can choose to alter their own collector for their test or compare their results with someone else. Testing is done by placing a thermometer in the container that students have chosen to put in the middle of their cookers. Read more [here](#). At this point, take photos of students' cookers.
6. (Day Seven, Eight, & Nine) Students create a blog entry that summarizes the project. Included in the entry are:
 1. a line graph that students create with a spreadsheet.
 2. a photo of their solar collector.
 3. their question and hypotheses.
 4. the procedure.
 5. the results (graph goes here).
 6. conclusions.
 7. answers to the [discussion questions](#).

Evaluation

See the [rubric](#) using the requirements for the final blog entry above.