



Solar Ovens

Solar Ovens Lesson 5: Renewable/Green Energy

AUTHOR: Debbie Abel

DESCRIPTION: In this lesson, students will be introduced to the different forms of renewable/green energy. They will learn about the photovoltaic cells installed in our school district, Beaverton Schools. However, any project on www.solar4rschools.org will work just as well.

GRADE LEVEL(S): 4 and 5

SUBJECT AREA(S): Science, energy, kinetic, potential, renewable, non-renewable, fossil fuels, global warming, climate change, solar energy, wind energy, hydroelectric power, sources of energy

ACTIVITY LENGTH: 00 hours, 45 minutes

LEARNING GOAL(S): Students will learn about and observe different forms of renewable energy. They will also learn about the different photovoltaic cells installed on Beaverton or other schools with Solar 4R Schools projects.

STANDARDS MET:

Next Generation Science Standards:

4-PS3-2. Make observations to provide evidence that energy can be transferred from place to place by sound, light, heat, and electric currents.

4-PS3-4. Apply scientific ideas to design, test, and refine a device that converts energy from one form to another.

3-5-ETS1-1. Define a simple design problem reflecting a need or a want that includes specified criteria for success and constraints on materials, time, or cost.

3-5-ETS1-2. Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem.

3-5-ETS1-3. Plan and carry out fair tests in which variables are controlled and failure points are considered to identify aspects of a model or prototype that can be improved.

.....

Solar 4R Schools™ is a program of BEF.

BONNEVILLE : 240 SW 1st Avenue
ENVIRONMENTAL : Portland OR 97204
FOUNDATION : 503-248-1905
: www.b-e-f.org

Student Background:

None, other than information from the previous lesson.

Educator Background:

Become familiar with how the use the www.solar4rschools.org, in particular whichever project(s) you plan to have students explore.

Materials List:

- Lego Simple and Motorized Mechanisms Base Set (optional)
- Lego Renewable Energy Add on Pack
- Electric fan
- Access to a sink
- Access to the Internet and the Solar 4R Schools website
- Solar Energy Student Workbook

Vocabulary:

- Renewable energy: Energy from resources that can quickly and easily be made or replenished.
 - Solar energy: Energy from the sun.
 - Solar panels: Panels that absorb sunlight in order to create electrical energy.
 - Hydropower: Energy from moving water.
 - Wind power: Energy from the wind.
-

Lesson Details:

Question of the Day/Exit Slip: What is renewable energy and how does it help the Earth?

- STEP 1: Before the lesson, build, or have a few students build, the Lego wind turbine, the Lego hydropower turbine and the Lego Solar Station. Choose 3 students to be the station experts. They will be in charge of the station while the other students observe. (You can also do the demonstration with the whole class instead of breaking into 3 groups.)
- STEP 2: Work with the class to do a vocabulary web for renewable energy.
- STEP 3: Explain to the students that one way to reduce pollution is by using devices that are more energy efficient, and another way is by using green or renewable energy.
- STEP 3: Split the class into 3 equal groups. Have them rotate to the 3 different stations and have them fill out the chart on page 10 of their Solar Energy Student Workbook as the observe the hydropower turbine, solar station and wind turbine.

Solar 4R Schools™ is a program of BEF.

BONNEVILLE : 240 SW 1st Avenue
ENVIRONMENTAL : Portland OR 97204
FOUNDATION : 503-248-1905
: www.b-e-f.org

- STEP 4: Go to the Solar 4R Schools website. (We used the Beaverton schools projects and so on the map, I had the students click on Oregon and then search the Beaverton schools down at the bottom) As a whole class, explore the website.
- STEP 5: Have the students answer the questions at the bottom of page 10 in their Energy Student Workbooks.
- STEP 6: Have students read the PGE booklets. Ideally, these booklets would be studied in depth during reading class.

Solar 4R Schools™ is a program of BEF.

BONNEVILLE : 240 SW 1st Avenue
ENVIRONMENTAL : Portland OR 97204
FOUNDATION : 503-248-1905
: www.b-e-f.org