



Understanding Energy

Lesson 3: Energy Research Project

AUTHOR: Eric Gronseth

DESCRIPTION: Students will build on their knowledge of renewable and non-renewable energy (third grade standards). Students will learn that all electricity production has impact on the earth. The class will do a compare/contrast activity of a renewable and a non-renewable source of energy. Following this activity, each student will research one type of energy source and **write a two-page paper about the advantages and disadvantages of that source of energy.** Each paper will then be reviewed by five students in the class and the author will receive feedback from each of those reviewers.

GRADE LEVEL(S): 4th, 5th

SUBJECT AREA(S): Energy, energy generation, renewable and nonrenewable energy, fossil fuels, natural resources, energy conservation, research

ACTIVITY LENGTH: 2 hours (40 min/day for 3 days)

LEARNING GOAL(S): Students will be able to describe the basic principles of various forms of energy and write a detailed description of one of those forms of energy. This written product will include common uses of this form of energy, costs, and basic advantages and disadvantages of using this form of energy.

NEXT GENERATION SCIENCE STANDARDS:

- 4-ESS3-1. Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.

UNIT CONTENT:

- Lesson 1: Energy Sort
- Lesson 2: Brainstorm Energy Sources
- **Lesson 3: Energy Basics**
- Lesson 4: Home Energy Survey
- Lesson 5: Solar Energy Basics
- Lesson 6: Home Energy Use
- Lesson 7: How to Observe and Keep Records
- Lesson 8: Setting Up an Experiment
- Lesson 9: Collecting and Reporting Data, Making Recommendations
- Ongoing Activities: Daily Observations and Record Keeping

Materials List

- Book collection from school library of books related to energy sources
- Computers for research of online resources and writing

Vocabulary

- **Energy sources:** Coal, oil, natural gas, wind, solar, hydro-electric, chemical, wood, wave.
- **Renewable energy** and **non-renewable energy**
- **Advantages** and **disadvantages**

Student Background

- Students will have previous knowledge of the difference between renewable and non-renewable energy sources.
- Students will have basic understanding of sources of energy and the fact that solar energy is an example of a renewable source of energy.
- Students will have knowledge of information sources and be able to verify information found online as well as in printed material.

Educator Background

- Teacher will need to have knowledge of renewable and non-renewable energy sources.
 - The teacher will need to have knowledge of on line resources for students to access to get accurate information for their writing.
 - The teacher will need access to books regarding various sources of energy. The school librarian may be able to assist in collecting these printed materials.
-

Lesson Details

Activity Day 1 – Prepare for Research

- Class will review the basics of renewable and non-renewable energy.
- Class will review the basics of renewable and non-renewable energy.
- Class will receive the assignment for the two-page description of the chosen energy source.
- Students will choose one energy source to research.
- Students will choose a book related to their choice of energy source.

Activity Day 2 – Active, Individual Research

- Students will begin/continue researching. Access to computers will allow you to discuss how to find credible sources and methods to increase their probability of giving accurate

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

information (e.g. finding three separate sources that all present corroborating information)

- Make it clear that students can and should be using this time to outline or draft their two-page research paper. Remind students that they should be discussing both the advantages and disadvantages of the source of energy that they are researching

Activity Day 3 – Active, Individual Research

- Students will continue researching and writing their papers
- This will be the last in-class day of researching and/or writing.

Activity Days 4 and 5 – Peer Review

- After papers are completed, pass them out to the class.
- Give students the opportunity to review at least five different papers. The role of reviewers will be twofold: first, to communicate what the reviewer learned by reading the paper and second, what questions the reviewer still has (or now has) after reading the paper. Have them write these comments on a separate reviewer paper that you will review and assess before handing them back to the writers of the papers.
- Doing this review in two sessions is nice to break up the task of reading and reviewing.

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