

Renewable Energy Sources



Re-Energy Activity Grade Level 7-12

Main Objectives

The purpose of this activity is to help learners research and share information about Renewable Sources of Energy to understand the alternatives to fossil fuel energy generation within different areas of Canada and the world. This approach acknowledges students as both educators and learners; they will teach and learn from one another.

Learning Outcomes

By the end of this activity, learners will:

- Identify non-renewable and renewable energy sources
- Research a renewable energy source
- Develop a model to demonstrate the use of a renewable energy source
- Present their research to their classmates.

Curriculum Connections

Alberta

Science 7: Heat and Temperature

Science 9: Electrical Principles and Technologies

Science 30: Energy and the Environment

Ontario

Science & Technology 7: Heat in the Environment

Science 9: The Characteristics of Electricity (Academic)

- Electrical Applications (Applied)

Environmental Science 11: Scientific Solutions to Contemporary Environmental Changes

(University/College Preparation)

- Conservation of Energy (University/College

Preparation)

- Energy Conservation (Workplace Preparation)
- Chemistry 12: Energy Changes and Rates of Reaction

Length of Activity

5 – 5.5 hours

Materials List

1. Internet enabled device
2. Re-Energy Learner Backgrounders:
 - a. Renewable Energy Sources
 - b. Solar Heat and Electricity
 - c. Hydro Energy
 - d. Wind Energy
 - e. Biomass Energy
 - f. Geothermal Energy
 - g. Hydrogen Fuel Cells
 - h. Heat Pumps
3. Learner Worksheet

Activity

Step 1: (30 minutes) Begin the class by distributing the Renewable Energy Basics backgrounder to learners and have them read it.

Step 2: (20 minutes) Divide the learners into groups of four or five individuals and assign a renewable energy source to each group from the list below for research:

- a. Solar heat and electricity
- b. Wind energy
- c. Hydro Energy
- d. Biomass energy
- e. Geothermal energy
- f. Hydrogen fuel cells
- g. Heat pumps

Distribute to each group the backgrounders on the assigned renewable energy source, which are listed under Materials List. Then have each group review the backgrounder.

Step 3: (10 minutes) Introduce and assign the research project as outlined on the Learner Worksheet.

- a. Have the learners work in groups to research the renewable energy source assigned to them.
- b. Provide the learners with the needed information to fill in the Timeline for Completion. Ensure that they understand the requirements of each date.

Step 4: (3 hours) Conducting the Research

- a. Have the learners write each of the evaluation topics as headings for their research document, this will essentially serve as their table of contents.
- b. Encourage learners to assign the headings amongst the group members from the total 10 headings.
- c. Have learners conduct the research and answering all questions outlined in the Evaluation Criteria listed on the Learner Worksheet.

Step 5: (70 minutes) Presentations

- a. Preparing presentations: (1 hour)
 - a. Learners will prepare their research presentation and display materials.
 - b. Have learners limit the presentation time to 10 minutes.
- b. Presentations: (10 minutes per group)
 - a. Learners can present their findings in any format, e.g., using PowerPoint, Canva, display charts etc.

Tips and Extension Activities

- For a unit introduction, have learners collect their home utility bills for one month and, having blacked out any account numbers, bring copies of them to class. Have students graph the amount of energy they use (this may be electricity, natural gas, or oil) and the cost. Have them estimate the cost of utilities for one year. Discuss options for reducing utility bills.
- Plan an Energy Night for students at which time they can present and demonstrate the findings of their research to their parents. The students are typically very proud of their research and models and enjoy sharing them with their parents. A community night could also be planned to increase the awareness of renewable energy sources among a larger audience.