

RESOURCE LIBRARY  
ACTIVITY : 25 MINS

## Energy Sources and Energy Use

Students discuss relationships between energy use and pollution, sort energy sources into renewable and non-renewable, and create a pie chart of the estimated energy use of the class.

### GRADES

9 - 12+

### SUBJECTS

*Earth Science, Geography, Human Geography*

## OVERVIEW

Students discuss relationships between energy use and pollution, sort energy sources into renewable and non-renewable, and create a pie chart of the estimated energy use of the class.

For the complete activity with media resources, visit:

<http://www.nationalgeographic.org/activity/energy-sources-and-energy-use/>

## Program



## DIRECTIONS

**1. Have students discuss their personal and family energy use.**

Ask:

- *How does the local power company generate electricity used in homes in your area?* (Possible answers will likely include a combination of several types of power plants.)
- *What other types of energy does your family use, and for what purposes?* (Possible answers for types of energy include electricity, natural gas, oil, wood. Possible answers for purposes include for lighting, electronics, cars, cooking, and home heating.)

## **2. Build background about connections between energy use and pollution.**

Tell students that sulfur dioxide, or SO<sub>2</sub>, is an indicator of pollution. Explain to students that chemical reactions in the atmosphere cause SO<sub>2</sub> emissions to contribute to acid rain. Acid rain, which falls in rain or snow, is harmful to plants and animals. One cause of SO<sub>2</sub> emissions is the burning of non-renewable resources. Ask:

- *What is a renewable energy source?* (energy resources that are replenished naturally, but the supply of which can be endangered by overuse or subject to weather)
- *What is a non-renewable energy source?* (energy resources that form in extremely slow geological processes)

Have students brainstorm a list of energy sources. Write their ideas on the board.

## **3. Have students sort energy sources into renewable and non-renewable.**

Draw a 2-column chart on the board with heads: Renewable Resources and Non-Renewable Resources. As a class, sort the energy sources they brainstormed into the correct columns in the chart. Answers should include:

- Renewable: timber, solar, wind, hydro-electric, biomass, biogas and liquid biomass, and geothermal
- Non-renewable: coal and coal products, oil, natural gas, and nuclear power

## **4. Create a pie chart of the estimated energy use of the class.**

Have students use the completed chart to estimate the percentages of their energy use that are renewable and non-renewable. With student input, sketch a pie chart for estimated energy for the class as whole, and label the two categories.

# OBJECTIVES

# Subjects & Disciplines

Earth Science

Geography

- Human Geography

## Learning Objectives

Students will:

- describe their personal and family energy use
- explain the relationship between energy use and pollution
- estimate the energy use of the class

## Teaching Approach

- Learning-for-use

## Teaching Methods

- Brainstorming
- Discussions
- Hands-on learning

## Skills Summary

This activity targets the following skills:

- 21st Century Themes
  - Global Awareness
- Geographic Skills
  - Answering Geographic Questions
  - Asking Geographic Questions

## National Standards, Principles, and Practices

## NATIONAL GEOGRAPHY STANDARDS

- **Standard 14:**

How human actions modify the physical environment

## NATIONAL SCIENCE EDUCATION STANDARDS

- **(9-12) Standard F-4:**

Environmental quality

- **(9-12) Standard F-5:**

Natural and human-induced hazards

### **Preparation**

### **What You'll Need**

#### **MATERIALS YOU PROVIDE**

- Paper
- Pencils
- Pens

#### **PHYSICAL SPACE**

- Classroom

#### **GROUPING**

- Large-group instruction

## BACKGROUND & VOCABULARY

### **Background Information**

Renewable energy sources are those resources that are replenished naturally. Non-renewable energy sources are those resources that form in slow geological processes. It's important for students to understand the relationship between energy use and pollution in order to make decisions about energy use at different scales.

# Prior Knowledge

## ☐ Recommended Prior Activities

- None

## Vocabulary

| Term                 | Part of Speech | Definition  |
|----------------------|----------------|---|
| non-renewable energy | <i>noun</i>    | energy resources that are exhaustible relative to the human life span, such as gas, coal, or petroleum.                                       |
| renewable energy     | <i>noun</i>    | energy obtained from sources that are virtually inexhaustible and replenish naturally over small time scales relative to the human life span. |

