

Activity: Conserving Electric Energy

(Information courtesy of the American Coal Foundation)

Overview:

Students participate in two experiments in which they (1) gain an appreciation for their dependency on electricity and (2) learn how regulating the rate of energy consumption makes the energy source last longer.

Objectives:

Students will:

- gain an appreciation for their dependency on electricity,
- analyze and contrast two graphs measuring the consumption of a resource under modified regulations, and
- understand that regulating the rate of consumption of a resource allows it to last longer.

Materials:

Pen and paper

Cookies or crackers (two per student)*

Overhead projector or blackboard

*Do not use any products that contain peanuts in case there are students with allergies.

Discussion Questions:

In what activities do you participate that are dependent on electricity?

How is that electricity generated?

Do you know how much coal and other natural resources are needed to generate the electricity you use in a given day?

Procedure:

After conducting a brief discussion about the nation's immense dependence on electricity, explain to students that more than half of the United States' electricity is generated by coal—far more than any other energy source. Our country's demand for electricity is on the rise as the use of microelectronic (e.g., computers) and other electronic equipment increases.

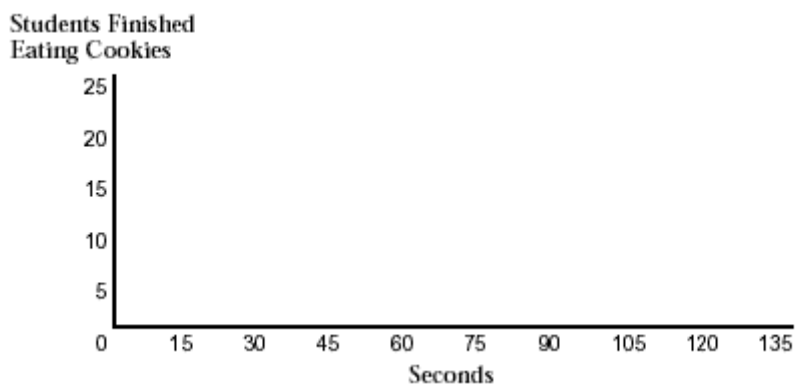
Ask students if they think they could live in their homes without electricity for just two hours. What would their lifestyle be like? For homework, ask students to try to survive without using any electricity for two hours. Discuss as a class the items that students will have to abstain from using. The list may include the following:

Radio or stereo	Computer	Microwave	Electric Stove
Hairdryer	Dishwasher	Washing machine	Clothes dryer
Lighting	Video gamer	TV/VCR/DVD	Can opener
Toaster	Coffeemaker	Refrigerator	Garage door opener
Freezer	Alarm clock	Water heater	

Make sure students document which hours they went without using electricity and how they had to alter their routine to avoid using electricity. During the next class period, discuss how students felt about not using electricity for that period of time. Did they realize how dependent they are on electricity? How would it affect people if the nation ran out of the energy resources needed to produce electricity?

Explain that fossil fuels, such as coal, oil, and natural gas, are called nonrenewable energy because they are limited in supply. It is important to conserve these natural resources so that they will last longer. Tell students they will participate in a brief and tasty activity to demonstrate the impact that regulating the consumption of a resource has on making it last.

Give each student a cookie or cracker. Give them a signal to begin eating and tell them to raise their hand when they are finished. Count the hands raised every 15 seconds until all the cookies or crackers are eaten. Create a graph like the one below indicating how many students finished eating every 15 seconds.



Give each student a second cookie. Tell them that this time they can only take a bite when you say, "Take a bite." Do this every 15 seconds and have them raise their hand when they have finished the cookie. Count the hands raised after every 15 seconds and create a second graph to indicate the consumption rates. This graph usually shows that the overall cookie resources last longer.

Discuss the two graphs. How are they the same? How are they different? Why did the cookies last longer when their consumption was regulated? Can we, or should we, conserve nonrenewable sources of energy, such as coal? Do individuals have a responsibility to conserve energy? Why or why not?

Assessment:

Have students write a paragraph explaining their opinion about conserving energy resources. What measures do they believe individuals can (or should) take to conserve resources such as coal? What, if any, measures should the government take to regulate individual or industrial rates of consumption?

Extension:

Students can research what regulations are in place for controlling rates of consumption of other natural resources in their area or nationally. They may want to investigate rainforest or old-growth preservations, oil drilling in the Arctic National Wildlife Refuge (ANWR), water consumption restrictions placed on drought-ridden areas, or other significant efforts. Allow them to share their findings with the class and encourage them to become involved with these efforts if they feel passionately about them.

Differentiation:

Encourage students who are drawn to the graphing element of this lesson to graph the consumption data in various types of graphs (pie, line, bar, etc.).