ACTIVITY 5: COOKIES!

(ADAPTED FROM THE AMERICAN COAL FOUNDATION)

NJ Standards

SOCIAL STUDIES:

6.2 Civics

E.5 Identify current issues that may have a global impact and discuss ways to address them.

6.6 Geography

B.2 Explain changes in places and regions over time and the consequences of those changes.

E.2 Explain the nature, characteristics, and distribution of renewable and non-renewable resources.

MATH:

4.4 Data Analysis, Probability, and Discrete Math

A.2 Read, interpret, construct, analyze, generate questions about, and draw inferences from displays of data.

SCIENCE:

5.1 Scientific Process

A.1 Raise questions about the world around them and be willing to seek answers through

B.2 Identify the evidence used in an explanation.

5.10 Environmental

B.1 Explain how meeting human requirements affect the environment.

JUNIOR ENERGY

NY Standards Correlation

SCIENCE:

4.1 d The Physical Setting

Energy and matter interact

7.1 a The Living Environment

Humans depend on their natural and constructed environments

7.1 b The Living Environment

Over time humans have changed their environment by cultivating crops and raising animals, creating shelter, using energy, manufacturing goods, developing means of transportation, changing populations, and carrying out other activities.

7.2 c The Living Environment

Humans, as individuals or communities, change environments in ways that can be either helpful or harmful for themselves and other organisms.

MATH:

3.S.2 Students will collect data using observations and surveys, and record appropriately

3.S.8 Students will formulate conclusions and make predictions from graphs.

4.PS.1 Students will explore, examine, and make observations about a social problem or mathematical situation.

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.

NATIONAL STANDARDS:

National Science Education Standards (NSES)
- Science in Personal and Social Perspective, 5-8
Populations, resources, and environments

National Council for the Social Studies (NCSS) Standards
- Production, Distribution, and Consumption
- Science, Technology, and Society

National Council of Teachers of Mathematics (NCTM) Standards
- Data Analysis, 3-5, 5-8

OBJECTIVES:

Students will:

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

TIME NEEDED:

One to two class periods

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.*

JUNIOR ENERGY

ACTIVITY:

1. After conducting a brief discussion about the nation's immense dependence on electricity 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 game	TV/VCR/DVD	Can opener
Toaster	Coffeemaker	Refrigerator	Garage door opener
Freezer	Alarm clock	Water heater	

2. 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?

3. 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.

4. 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.

5. 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.

6. 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?

7. 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? What, if any, measures should the government take to regulate individual or industrial rates of consumption?