

LIFE WITHOUT ELECTRICITY

Adapted from the University of Iowa's Energy Education Curriculum Project

Overview: This lesson shows us how electricity shapes our lives. Students read about life without electricity in Kenya and then participate in a class discussion.

Objective: Students will increase their awareness about the availability and use of energy in other cultures.

Subject: Social Studies

Suggested grade level: 5 – 8

Materials: "Life Without Electricity" letter (included), poster board, reference books, texts



Life Without Electricity

PROCEDURE

After reading “Life Without Electricity”, use the following questions to guide a class discussion.

1. What renewable sources of energy are mentioned in the letter?
(Firewood and wood charcoal; sun; also students may mention candles and gas which may be “renewable,” depending on the raw material base for each. Candles can be made of beeswax or tallow, which are “renewable” or from paraffin, a non-renewable petroleum by-product. Natural gas, L.P. gas, or propane is associated with oil production from underground reservoirs and is not renewable. Methane or “biogas” from anaerobic digestion of organic wastes is renewable. In fact, the candles and gas to which Jency refers are petroleum by-products and are therefore non-renewable.)
2. What non-renewable energy sources are mentioned in the letter?
(Cooking gas, batteries, kerosene, paraffin, candles)
3. Which of the above energy sources did your grandparents use 40–50 years ago?
4. Which of the energy sources mentioned above do you use regularly now?
5. What would you have liked best about her low-energy-use situation?
6. What would you have liked least?
7. How has lack of electricity changed her living habits?
(Note references to cooking and food storage; laundering; sleeping schedule; transportation)
8. If you were to take Jency’s place in Kenya, what would present the greatest challenge to your present lifestyle?
9. What would be necessary for your survival in a remote Kenyan village? Would you have to take some articles from home with you? Explain.
10. Locate Kisii, Kenya on a map of Africa.
What is its latitude? (0.5 °S)
What is its longitude? (nearly 35 °E)
What is its elevation? (high plateau, mountainous terrain, more than a mile high)
11. What does the above information tell you about insulation (incoming solar radiation) in that part of Africa?
(Near the equator, solar insulation is maximal. The sun is directly overhead twice yearly and the lowest “winter” angle is comparable to the angle of the summer sun in Iowa. The high elevation means that the atmospheric blanket of air is thin. By day, less insulation is lost to atmospheric screening, but more heat is lost at night than would be true in the lowlands. Cool nights and snow on the highest peaks are possible.)
12. How does the local climate near Kisii moderate basic energy needs (compared to Iowa)? (Little additional heat is needed for keeping people warm. Well-sealed homes that need artificial heating

Life Without Electricity

and cooling are not necessary for survival. However, heat for purifying water and milk is even more important for good health than here because tropical microorganisms are very numerous. Long growing seasons make long-term food storage less important than in Iowa, but heat is necessary for some forms of preservation— including tea production. Less clothing is needed for personal warmth. Transportation vehicles, where available, run more efficiently in warm climates than in cold ones. Animals require less food to maintain body temperature and growth rate than they do in more variable climates. Trees grow faster so, if replanted, replace firewood faster. Daylight hours are never much longer nor much shorter than 12 hours so opportunities for evening activities are very limited unless some other source of light is available, even at the peak of summer.)

EXTENSIONS

1. Language Arts: Decide upon an item that uses electricity and eliminate it from your life for one day. Keep an hourly log describing your feelings/thoughts about not having access to this item.
2. Students could write reports on the following topics: How Charcoal is Made, Kerosene Lighting, First Power Plants, Pump Stoves, Charcoal Iron, Batteries, Paraffin, Electric Street Lights.
3. Culture Fair: Divide class into groups. Each group can research the lifestyles of one culture. Information gathered from the research can be presented to the class on a chart with the following categories: Communication, Transportation, Food, Recreation, Clothing, Homes, Occupations, Education, and Technology.
4. Guest Speaker: Someone who has lived/grown up in a developing country could provide a first-hand account of life without electricity.

Life Without Electricity

A Peace Corps Experience

INTRODUCTION

After graduation from the University of Iowa, Jency Patterson joined the Peace Corps in the summer of 1978. She was sent to Kenya, East Africa where she became one of four teachers staffing a 90-student Harambee high school. The rural village that is her home now lies in mountainous terrain near Lake Victoria and Kisii in western Kenya. The area has only two seasons, the rainy and the dry. Daytime temperatures do not change much throughout the year, but nights during the dry season can be chilly. Here are some of Jency's comments on her new life without electricity, excerpts from a letter she wrote to a snowbound friend in Iowa:

THE LETTER

Keroka, Kenya, January 22, 1979

For your own knowledge, I'll try to describe some of the energy uses here. Of course, there is no electricity. There is some in Kisii town which is about 12 miles away. Everyone lives in small mud and thatched huts. The only permanent buildings around are the school and my house. Even the small dukas (shops) down the road are made of tin.

Firewood is commonly used if the dead wood can be found. (I came back one weekend to find many of my trees chopped down.) It's hard for these people on the top of the mountain and on the sides because the trees help prevent erosion, yet they need the wood for cooking and occasionally for warmth. They cook in their huts on the floor or in chiko—a small round metal container. It sits on the ground and is similar to our barbecue stoves. The old men in the market make them and sell them for about 15/= to 25/= (\$2–\$3).

December is also charcoal making month. All over the hills you can see smoke billowing. They chop the wood and cover it with dirt, leaving some small holes, and then light it to remove the impurities. After about 18 hours they have charcoal. This is sold for about 20/= (\$2.50) for a large burlap bag. This is what is most commonly used in the chiko cookers. They use kerosene to light them. This is also used in their lanterns.

Candles are also used for light, but not often. (I do use them, but they are expensive here.) Kerosene costs about 11/= (\$1.50) for five liters. I also have a pressure lamp which is about 600 candle power, but these are very expensive. Mine cost about 300/= (\$43). I almost feel bad about having it, but figure the cost of my eyesight is worth a lot more than the impression these people will get of me having so many things.

A few, very few, wealthy people use a gas cooker. There are also pump stoves that run on paraffin and some people use these, but I prefer the charcoal. After awhile, all this becomes a way of life. I really enjoy not having electricity. Life is very simple without it. People usually go to bed early here too. 9:00 p.m. is “getting very late, madam!”

Kenyans depend on the sun for so much—time, drying clothes, crops. It seems the days are getting longer here, too. Of course there is no running water either. I’m the only one within several miles who has a rain tank. The school provided it, but it leaks and thus I too am dependent on the “river” (small stream actually) for most of my daily water needs. Because of my cooker I can warm my bath water but most either bathe in the river or out of a bucket; both are chilling experiences, believe me!

Because there are no street lights there is very little transport on the road after 6:30–7:00 p.m. The Africans’ eyesight must not adapt too well to driving at night. Torches (Flashlights) are a part of every household. Batteries are very expensive. I have gone through so many. In physics I taught my kids that if you put the cells in the sun when they are weak, this exposure will repolarize them so that they can be used again. They were thrilled.

In all of Kenya there is only one “laundromat.” It’s in Nairobi and you can bet four of the six machines are always broken. Everyone does laundry by hand, then lays it on the grass to dry. I’ve learned to fold mine so they don’t have too many wrinkles. There are charcoal irons though.

Of course, with no electricity there is no refrigeration. Many simply don’t need it. My eggs last about three weeks and up on my hill my fresh butter will stay hard for two weeks. I’m extremely atypical though. No one else has the coolness I have. There is milk in cartons I buy called UHT—it is ultra heated. Also margarine comes in a can and dried milk is popular. Many people enjoy the “sleeping milk” which is sour and curdled and kept in gourds. Kenyans think that the soured milk is very sweet and they simply can’t understand why I don’t like it. They use fresh milk only in tea.

Hope this gives you some picture of life without electricity. Cold sodas are unheard of as is beer.

You get used to things!

As always,
Jensy