

Cooking Curanto

Hola. ¿Tienes hambre?

That's Spanish and it means, "Are you hungry?" How would you like to travel to Chile in South America and eat curanto? Curanto is like a stew with lots of yummy food. It has chicken, sausages, pork chops, clams, mussels and potatoes. But the best part is preparing the stove to cook it. The Mapucho Indians from Chile make a stove in the ground. They dig a large hole and fill it with burning coals. They then cover the coals with stones where the food is placed. Leaves from a plant called Nalco are then used to cover the food, plus a cloth that keeps in all the steam. The curanto now cooks for an hour or so and then it's time to eat.

Biomass

For thousands of years, people all over the world have used wood to fuel their cooking fires. From Chile to Nepal to Kenya, people (usually women and children) search mile after mile for any type of plant life that may burn. When you burn a log in your fireplace or in a campfire, you are using **biomass**. Biomass contains stored **solar energy**. As green plants absorb sunlight, water, and carbon dioxide to make their own food during **photosynthesis**, their leaves trap the sun's energy. This chemical energy becomes heat and other forms of energy when it is set on fire.

Biomass comes in many different forms. It may be "fuelwood"; it may be grasses; it may be agriculture crops such as sugarcane and corn; it may be by-products (the left over material) of food and forest production such as sawdust, corn and rice husks. Biomass can be used in its natural state as a solid fuel or **converted** into liquid or gaseous fuels and is used for many different energy markets such as electricity, heating, and transportation.

Deforestation

Biomass supplies 50% to 90% of all energy used in less-developed regions such as Africa, Asia, and South America. This means a lot of plant material, especially trees, is being cut down and burned. Clearing land of its trees is called **deforestation**. Deforestation is occurring for many reasons. The demand for wood has increased as the world's population has increased. People are clearing forests for living space and to grow crops. More people also mean more and more fuelwood is being collected as an energy source for cooking and heating. Growth in population has also increased the demand for wood products such as paper and furniture.

Many environmental problems occur because of deforestation. Fewer trees means more sunlight hits the soil and dries it out. The soil then becomes **infertile**, meaning plants can't grow in it. Soil also becomes infertile when natural fertilizers such as leaves and seeds do not fall and **decompose** in the earth below. Some scientists think the infertile conditions of the soil due to the overharvesting of vegetation have caused famines in Africa.

Deforestation also contributes to air pollution. When forests are cleared, fewer plants are available to consume carbon dioxide through photosynthesis and less oxygen enters the atmosphere. Biomass that is burned also releases its stored carbon dioxide. It is estimated the 10% of the carbon dioxide being added to the atmosphere is from the burning of biomass. Carbon dioxide is a greenhouse gas, which traps the sun's heat, making the Earth warmer.

Kenya

Many efforts are being made to stop deforestation. Kenya is one such place. Kenya is a country of the African continent. Neighboring countries are Ethiopia to the north, Somalia to the east, Tanzania to the south, and Uganda to the west. Most people in Kenya speak three languages. They speak English,

Kiswahili, and their tribal language. English is the official language while Swahili is the national language. That means that education and government communications are in English, while everything else tends to be communicated in Swahili. A tribal language is the language that is used within the family unit. There are over 30 tribal languages in Kenya.

Science Classes in Kenya

Think about what you have learned in your science classes recently. I bet you have learned about the solar system, animals, and plants. Children in Kenya also study these interesting topics, plus a topic you do not. Some students in Kenya learn about “Cooking to Conserve.”

Cooking to Conserve

Bellerive Foundation wrote “Cooking to Conserve” with support from the World Wildlife Federation (WWF). It is a unit of study that describes cooking practices and technology that can help to conserve fuelwood. Kenya is a country where biomass is the main source of energy for cooking and heating. It is estimated Kenya uses trees to meet 71% of its total fuel needs. Throughout the world trees are being cut down at an alarming rate to meet the needs of growing populations; it is no different in Kenya. Finding firewood can be a difficult, time-consuming task. “Cooking to Conserve” shows how people are problem solving to conserve biomass with energy-saving techniques and technology.

Energy-Saving Techniques and Technology

Cooking is a relatively easy task for most North Americans. A dial is turned on the stove and *voilà!* – a flame appears. Starting a fire in most Kenyan homes isn’t as easy. Firewood must first be collected, cut, and set on fire. Below are interesting “tricks of the trade” middle school students in Kenya are learning to make their job easier and most importantly to conserve trees.

Heat Concepts: Radiation, Convection and Conduction

One cooking lesson focuses on the importance of building and maintaining an **efficient** fire. An efficient fire produces lots of heat energy without wasting firewood. Students learn about heat concepts such as radiation, convection, and conduction. Understanding these three concepts help Kenyans when cooking on an open fire.

Radiation

Fires radiate heat just as the sun radiates heat and warms the earth. Good fire practice is to build a fire in such a way that it **insulates** the heat. You want to insulate a fire just as you insulate your body on cold days. When you dress for cold weather, you wear warm clothing, which keeps your body heat from escaping. One way to build an insulated fire is to dig a hole and build it slightly in the ground where the dirt walls insulate the fire and direct the heat towards the cooking pot.

Convection

Heat can travel through gases or liquids. This is called convection. Gases from the burning wood rise and will heat the pot only if the wind doesn't interfere. One easy solution is to shield the fire to keep the wind from blowing away the warmed gases.

Conduction

Conduction is also important to understand. Materials absorb heat and get hot: this is conduction. Some materials get hot faster than others. Metal pots heat up faster than clay pots, but they also lose their heat faster than clay ones. Clay pots are best to choose if you need to cook something that takes a long time, like beans. Clay holds heat longer, thus less firewood is needed.

Dry Firewood Versus Wet Firewood

Using dry firewood is another topic Kenyan children study. There are two important reasons for using dry firewood. One is that dry firewood burns cleaner and more efficiently than wet firewood. More smoke is produced with wet firewood because the fire is driving away the moisture. The fire has to work very hard to do this and thus produces less energy to warm up the pot. As a result food takes longer to cook.

The smoke produced by fires with wet wood is also a health hazard. You have learned about the effects air pollution can have on people's health. In developing countries, it is estimated that respiratory infections kill one-third of the children who die before the age of five.

To ensure that dry firewood is available when needed, Kenyan children are taught how to cut, split, and store firewood. Wood that is cut from trees is one-third water. The wood dries out as the water seeps to the ends and **evaporates**. This process takes less time if the wood is cut into shorter lengths to decrease the travel time of the water. Children are taught to cut the wood to speed up this evaporation period.

Splitting the firewood also helps to speed up the evaporation period. When you split a log into fourths you increase its surface area. There are now more open areas to the log where water can evaporate. Increasing the surface area of a log also helps a fire burn more **efficiently**. The wood is now ready to be stored.

Cooking In A Basket: Fireless Cooking

***THIS ACTIVITY MUST BE CARRIED OUT WITH
ADULT SUPERVISION***

Kenyans use a fireless cooking technique. Fireless cooking means fewer trees are being used for fuel wood. The key to this

technique is insulation. The heat stored in insulation cooks the food. Some Kenyans use a basket with a lid, but you can use a box. Find a box that can hold your choice of cooking pot with about three extra inches on each side.

Fill the box with insulating material such as dry hay and leaves, straw, wood shavings or newspaper (your pot will be nestled in this material.) Leave enough space at the top for a pillow that you'll place on top of the pot when the time comes.

If you wish, you can line the insulating material with a piece of cloth to keep it from falling in the food. Tuck the cloth in at the sides of the box. You may even try stapling it in place.

Choose a recipe. Choose something that takes awhile to cook like rice or beans. Start the cooking process on the conventional stove. Once the food begins to boil have your teacher transfer it immediately to the cooking box. (Kenyans bring food to a boil on an open fire and then transfer it to the basket. They extinguish the fire immediately to conserve the firewood.) Cover the pot with an old pillow you have previously filled with insulating material and then close the box. Check your dish in about an hour.

You may also place a warm stone or brick at the bottom of the nesting material.

Let's Go Camping

You may not cook on open fires daily, but you may be able to apply some of these practices when you are camping. Your friends will be impressed with your knowledge, but most importantly, you will be using as little firewood as possible.

You're An Expert!

1. Write questions for your classmates using information from this article.

2. Complete the given paragraph frame about deforestation.

Take Action.....

Many Boy Scouts and Girl Scouts go camping every year. Write a booklet for them that explains why conserving firewood is important and what they can do to conserve it. Include illustrations. Distribute it to pack leaders.

Cooking Curanto

Name _____

Date _____

Paragraph frame for "COOKING CURANTO." This paragraph frame is specifically about deforestation.

Although I already knew

I learned some interesting facts about deforestation after reading "COOKING CURANTO."
For instance,

I also learned

Another fact I learned

And would you believe

However, the most interesting thing I learned
