

Dr. Seuss and the Lorax Tree

Objectives:

To have students listen to two sides of a deforestation issue. Students will decide on how to manage deforestation in Panama.

Learning Skills: critical thinking, problem-solving, cooperative learning.

Materials: fishing line, paper cup, lobster trap, six-pack ring, resin pellets, plastic bag, hospital needle, lost net, rubber bands, pencils, easel, white paper

Background:

Panama is infamous because of its biodiversity. It forms a unique "biological corridor" for Central and South America, reaching from the western border with Costa Rica to the eastern border with Columbia. Thousands of species exist in Panama which are found nowhere else. Panama has over 10,000 species of plants, of those only 1,250 are known to exist only in Panamanian rainforests (Panama Canal and Ecology). Rainforests have been around for about 60 million years- the oldest land based ecosystem on earth (Tropical Rainforests, STRI). However, nearly 80% of the world's ancient forests have been destroyed and only around 20% of the world's large ancient forests remain intact.

Discouragingly, deforestation in Panama, is proceeding at the rate of 57,000 hectares a year, due to legal and illegal logging, mining operations, the clearing of forest for cattle ranches and subsistence farming (USAID Congressional Presentation, 1997) and tourist development. In addition to illegal logging, the Panamanian military, participated in the destruction of land, by cutting down trees which resulted in 1.5 million cubic feet of timber. This wood was sold to China by the former de facto ruler, General Manuel Noriega (Panama Canal and Ecology).

Despite massive deforestation in Panama, forty-three percent of Panama remains forested and twenty-five percent of it is protected as a national park or other conservation area (International Panama Program, 2001). Currently, forested areas that are under protection, include the Panama



Canal watershed, San Lorenzo, the Bocas del Toro region, northern province of Chiriqui, and San Blas Comarca region. If the accelerated rhythm of deforestation continues, in only ten years less than 10% of the Panamanian natural forest will still remain.

Over the past thirty years, the Panama Canal watershed has experienced massive deforestation thereby reducing its forest cover by more than 60% and eroding its river valleys and lake shores (USAID). Consequently, the fresh water supplies of the Canal watershed are increasingly vulnerable to silt, flood and drought. This means further deforestation could threaten the water supply and future operation of the Panama Canal particularly during the dry season when the Canal must rely upon stored water.

Since the canal is run on fresh water which only comes from Lake Gatun, rainforests are needed for this continuous supply. One may then ask "How does the tropical rainforest stabilize the climate and protect the land around the watershed?" Tropical forests do not only stabilize the Panama Canal watershed but the world' climate. The trees reabsorb rainwater through their roots and then return great amounts of moisture to the atmosphere through transpiration to form new rain clouds. These vapor blankets reflect heat into space to maintain a constant temperature below. At the same time, equatorial forests protect the land by regulating rainfall. The foliage and limbs slow down torrential rains so that the protected ground can absorb water. Groundwater can then reenter soil layers without displacing topsoil.

What would the consequences be if the loss of rainforest continues around the watershed area? Since Lake Gatun supplies the water to Panama City and surrounding areas, a loss in rainforests would result in a loss of water to more than 700,000 people. Habitats would also be lost. Economically, Panama will be devastated. If there is no water to run the locks, there will be no jobs, without jobs there will be no ships and without ships Panama will lose its most significant business.

Strict and serious measures need to be taken to save the watershed. The administrative initiatives are already there. However, these initiatives need to be enforced. Although the government has set aside much of the remaining forests as parks or preserves, farmers are still allowed to clear land and the government still invites foreign investors to develop along the Canal for possible condominiums and resort sites. The government needs to manage their limited natural resources effectively. Conservation and

education are the only other ways to help the watershed. Developing awareness campaigns would also help.

What about the farmers who need to grow crops and raise livestock for a living? Where will the squatters live? These are all important community problems that need to be addressed. Culturally, Panama is laid-back when it comes to community awareness. People in Panama just do what they can to survive. The government needs to help these people work together to solve their problems; otherwise, it is natural for people to become self-interested and focused on their survival.

Vocabulary: deforestation, conservation, habitat, renewable resource, non-renewable resource, industrial contamination.

Methodology:

1. Docents will welcome students to Culebra Exhibition Center and each docent will introduce himself or herself.
2. Docents will begin with the deforestation theme by first asking students how they would like to become part of a story written by Dr. Seuss. Show the storybook to the students. By just showing the cover of the book, see if students can guess what today's topic will be on.
3. Once the word "deforestation" has been mentioned, ask students what they know and have heard about deforestation.
4. During this discussion, be careful not to influence the opinions of the students.
5. The docents will tell the students a story will be read to them and that the story has two main characters. They need to listen very carefully because after the story is read to them they will be the investigative reporters.
6. The students will be given a minute to decide what news channel or newspaper they will be reporting for (of course we know this is just pretending).
7. The docents will have to read the story aloud and have to Act! The Lorax really never considers the Oncler's point of view and the Oncler never considers the Lorax's point of view. They are constantly attacking each other so the students will clearly see two very different sides to the issue.
8. Once the story has been read, one or the other of the docents will tell the students that they may begin asking questions to the Onceler and the

Lorax. To really create excitement, the Lorax and the Onceler can pick on each other. For example, the Onceler might say that the Lorax has never had to build a house to keep his family warm nor needed a boat to go down the Chagres River. The docents must be prepared to answer all sorts of questions and they must be able to keep their characters' point of view. In other words, the Onceler must keep his attitude about business although the docent may have certain attitudes about deforestation. During this discussion, the docents should guide the students to discuss deforestation, renewable and non-renewable resources, conservation, biological diversity, habitats, as well as industrial restrictions and pollution.

9. After all the students have participated, the docents should ask each student to choose a partner. In pairs, the students will write a plan for conserving natural resources. The students might make some type of pledge. For example, "I will not buy paper that has not been recycled," or "I will always recycle to preserve and reuse resources."
10. The docents will allow students to share their ideas and conservations plans with the larger group. It is very important to be sensitive to students' parents who may work in logging industry, for example.
11. The docents will ask students for any questions and if any unanswered questions remain docents will help locate resources to help answer these questions.
12. Lastly, students will be taken for a short walk through the dry forest where docents will help students identify native Panamanian trees such as Jobo, Corotu, Guarumo, Jagua, Guacimo, and Olivo which are used for products like dyes, waxes, rubber, fibers, and furniture.

Extensions in classroom: Many times we hear the Metropolitan Park referred to as a "vital pair of lungs." In fact, it is the only rainforest in Central America found within a city. Discuss why the Metropolitan Park is so critical to Panama's community. Perhaps the class can take a field trip to the park and actually walk up one of the trails. Students can identify familiar and non familiar trees by recording and sketching them in a log book. In the classroom, students can research why these trees are so important to our environment.

Evaluation: Students will present their plans on how to conserve natural resources to their fellow classmates. Their conservation plans will be a good indicator of learning.

References: Croat, Thomas, 1978, Flora of Barro Colorado Island
Flora of the Panama Canal Zone, Bulletin of the US National Museum,
January 31. 1928
International Panama Program, 2001, [nature.org/international/
work/art575.html](http://nature.org/international/work/art575.html)
Jukofsky, Diane, September 29, 1999, [ens.lycos.com/ens/
Sep99/1999L-09-29-04.html](http://ens.lycos.com/ens/Sep99/1999L-09-29-04.html)
Mitchell, Jo (Dec 14, 1966), Panama's Indians Confront New Conquistadores,
www.foreignwire.com/panama.html
Rainforests www.stri.org/Rainforest/how.html
Panama Canal and Ecology. www/a,erocam/edi/projects/

Mandala/TED/canal.htm

Tropical Forests: Endangered? [www.seaworld.org/
Tropical_forests/endangtf.html](http://www.seaworld.org/Tropical_forests/endangtf.html)

USAID Congressional Presentation, 1997

Vanderbloemen, Laura (Initial idea to use story book for children in debate form presented by Laura)

List of Native Panamanian Trees

Common Name

Aromo, manca-caballo: The mesquite is a common tree along the Pacific coast of Central America. The hard-grained wood is valuable for many purposes. The pods contain much sugar and are eaten by stock. In Panama, mesquite is called "aromo," a widely used name in western Central America. The name "manca-caballo" has also been used in Panama.

Corotu (Ear Tree): It is a brown wood that is not very heavy but is rather durable and takes a good polish. It is exported to the United States to be employed for interior finish.

Guacimo: One of the most common plants of Central America. The bark contains a tough fiber that is sometimes twisted into rope. The mucilaginous sap has been used for clarifying syrup in the manufacture of sugar. The wood, light pinkish and rather light but tough and strong, is used locally for construction purposes and for charcoal. The fruit is called "cabezas de negrito" in Panama.

Guarumo: This tree is an abundant tree in Central America. There is probably no other single plant that has so large a part in giving to Central America vegetation. The trunks of the tree are hollow and commonly inhabited by small ants which bite when disturbed. The tough fiber of the bark has been employed by Central American Indians for cordage, mats, and a kind of coarse cloth. The sap is said to yield small amounts of rubber.

Jagua: The wood of this tree turns bright-pink when cut, coloration characteristic also of some other plants of the family. This tree is well known in Panama. The wood is strong and resistant, flexible, whitish, tinged with gray and useful for many purposes. The bark is reported rich in tannin. The juice from the sap although clear quickly turns into a brownish or blackish permanent stain. Primitive inhabitants use the dye for dyeing and especially painting the body. The Indians also use the dye to paint their faces.

Jobo: Jobo's wood is soft and almost useless. It is frequently planted for shade. The fruit may be cooked and used for making "frescos" which many Latin Americans enjoy. The fruit is nearly always eaten raw.

Olivo: These plants are trees with milky sap. In Mexico and Salvador, the sap is reputed as poisonous and trees are often left standing when the ground is cleared. In Panama, however, the sticky sap, when it has coagulated is chewed by boys, who place it on twigs for the purpose of catching small birds.