Magical Rainforest Bag

Theme

Rainforests have been called the womb of life because they are home to 50-90% of the species on Earth. Worldwide, several hundred million forest-dwelling people live in or depend on rainforests. Many of the world's important food crops and domestic animals have been developed from rainforest species. Human beings depend on rainforests in numerous ways, but it would be wrong to suggest that they should be preserved purely so that they can be exploited by humans.

Learning Objectives

- Participants understand the basic structure of a tropical forest.
- Participants understand the ecological and economical importance of tropical forests

Vocabulary:

forest floor
understory
canopy
emergent layer
epiphytes
lianas
drip tips

Introduction

What Makes the Tropical Rainforest Special?

- The rainforests are home to half of the Earth's plant and animal species.
- They are winter homes to many birds that breed in temperate latitudes.
- Tropical rainforests are some of the most beautiful wildernesses on our planet.
- They are home to tribal cultures that have survived successfully in the forests for many thousands of years.
- The forests are a potential source of medicinal plants that may benefit everyone on Earth.
- The ecosystem of the rainforest is based on the most complex interdependence of plants and animals. This is both the forest's strength and its weakness: highly specialized organisms are particularly vulnerable to disturbance, because they cannot adapt fast enough to survive the change.
- Tropical rainforests help maintain global rain and weather patterns. Much of the water that evaporates from the trees returns in the form of rainfall. Removal of the forest can change the natural rainfall patterns.

Tropical Rainforest Adaptations

- In sharp contrast, the climate of the tropical rainforest is hot and wet.

- With over 80 inches of rain per year, as opposed to the desert's 10 inches or less, plants have adaptations that enable them to shed water efficiently. The leaves of many rainforest plants have *drip tips* for this purpose.
- Buttress and stilt roots are thought to provide extra support for trees growing in spongy, wet soils.
- Tropical rainforest plants also have adaptations to take in what little sunlight is available on the dark forest floor. Large leaves are common; they increase the amount of sunlight a plant can capture.
- Other plants, like orchids, bromeliads and ferns, grow as *epiphytes* high up in the canopy where there is more sunlight.
- *Lianas* are climbing woody vines that drape rainforest trees. They have adapted to life in the rainforest by having their roots in the ground and climbing high into the tree canopy to reach available sunlight. Many lianas start life in the rainforest canopy and send roots down to the ground

Tropical rainforests have four layers:

Emergent Layer
These giant trees thrust above the dense canopy layer and have huge mushroom-shaped crowns. These trees enjoy the greatest amount of sunlight but also must endure high temperatures, low humidity, and strong winds.

Canopy Layer
The broad, irregular crowns of these trees form a tight, continuous canopy 60 to 90 feet above the ground. The branches are often densely covered with other plants (epiphytes) and tied together with vines (lianas). The canopy is home to 90% of the organisms found in the rain forest; many seeking the brighter light in the treetops.

Understory
Receiving only 2-15% of the sunlight that falls on the canopy, the understory is a dark place. It is relatively open and contains young trees and leafy herbaceous plants that tolerate low light. Many popular house plants come from this layer. Only along rivers and roadways and in treefall and cut areas is sunlight sufficient to allow growth to become thick and impenetrable

Forest Floor
The forest floor receives less than 2% of the sunlight and consequently, little grows here except plants adapted to very low light. On the floor is a thin layer of fallen leaves, seeds, fruits, and branches that very quickly decomposes. Only a thin layer of decaying organic matter is found, unlike in temperate deciduous forests.

Activity: Magical Rainforest Bag

Materials Required: Rainforest Bag, Rainforest Items (See rainforest answers document stored in the rainforest bag.)

Steps

1. Gather tour in Rainforest room.
2. As participants enter the room, pass out items from the bag to the participants. There are 20 items in the bag.
3. Ask the participants to show their item to at least two other participants and discuss for 1-2 min how the item is related to a rain forest.
4. To forestall anyone focusing on items made out of rubber, demonstrate step 3 by showing the participants the World Ball and discussing rubber tree plants (see rain forest answer sheet). Announce that if the participant's item is made of rubber, they need to focus on another way the item is related to the rain forest.
5. Have each participant stand and tell what they think each item has to do with the rain forest.
6. Use the rain forest answer sheet to verify participant answers.

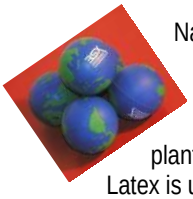
Following and Test for Understanding

- Give the participants the link to the Tropical Forest coloring page at Enchanted Learning
http://www.enchantedlearning.com/subjects/rainforest/Mapbw.shtml
- Give the participants the link to the Tropical Forest quizzes at Enchanted Learning
http://www.enchantedlearning.com/subjects/rainforest/classroom/

As the rainforest species disappear, so do many possible cures for life-threatening diseases. Currently, 121 prescription drugs sold worldwide come from plant-derived sources. While 25% of Western pharmaceuticals are derived from rainforest ingredients, less that 1% of these tropical trees and plants have been tested by scientists.

Creating a carved gourd art piece is time-consuming. The outer green skin is cut away, the gourd is cleaned and dried in the sun, and design is drawn onto the gourd. Then a carving tool called a buril is used to remove small pieces of the surface. To create the dark brown colors, burning pieces of Quinal wood are used. Gourds are created by families working in a community high in the Andes mountains of Peru.

We owe the discovery of many food crops to tropical rainforests like spices. Think of how cinnamon, cloves, vanilla, nutmeg, cloves, ginger, coffee and chocolate smell.



Name ten things you use everyday made of rubber.

Rubber is a product of the rain forest. It comes from a rubber tree plant. These plants produce a sticky material called latex. Latex is used to make rubber.

Rainforests are the wettest area of land in the world. As much as 32 feet of rain may fall during a single year in some places.

Rainforests maintain global rain and weather patterns.

Rainforest vines can grow longer than a football field, and thicker than a man's body. Some leaves can reach six feet in length!

An area the larger than the size of 5 football fields is being destroyed every minute (National Geographic January 2006)

11/12ths of the world's ferns are found in the rainforests.

Trees and plants help to keep the air around us clean. They use sunlight, water, and air to make food. In the food-making process they make use of the part of the air that we breathe out (carbon dioxide) and produce the part that we breathe in (oxygen).

There were an estimated ten million Indians living in the Amazonian Rainforest five centuries ago. Today there are less than 200,000.

The balance of life in the rainforest depends on the level of light reaching each layer of forest. Plants found on the forest floor require very little light, since the thick canopy filters out most direct sunlight. Clearing trees for cultivation and even selective logging of valued trees such as mahogany upsets this balance by changing the amount of direct sunlight that reaches into an area.

Often described as the Earth's lungs, only in reverse, the tropical rainforests, take in vast quantities of carbon dioxide (a greenhouse gas) and through the process of photosynthesis, converts it into clean, breathable air. In fact, the tropical rainforests are the single greatest terrestrial source of air that we breathe.

Red-Eyed Tree Frogs are amphibians (animals that spend part of their lives under water and the remainder on land). They are nocturnal (most active at night); they rest on the undersides of large leaves during the day. The Red-Eyed Tree Frog is a meat-eater (carvivore). It eats mostly insects, catching them with its long, sticky tongue. Some bats, snakes, and birds eat the Red-Eyed Tree Frog.

Epiphytes are plants that don't need soil to live. They are commonly called "Air Plants", and live in trees that are in the rainforest. Orchids are the most famous of epiphytes, and as many as 50 different orchids have been found on ONE single rainforest tree! Over 27,000 species of air plants have been found in the rainforests.

At least 3000 fruits are found in the rainforests; of these only 200 are now in use in the Western World. The Indians of the rainforest use over 2,000.

Cola comes from the rainforests.

Vincristine, extracted from the rainforest plant, periwinkle, is one of the world's most powerful anticancer drugs used to fight childhood leukemia Chinchona bark," is the source of quinine first used to treat malaria. The bark of the uprooted tree is beaten loose, peeled by hand, and dried quickly to prevent the loss of alkaloids.. Experts now believe that if there is a cure for cancer and even AIDS, it will probably be found in the rainforest.

Every day, people eat foods that started out in the rain forest. Each time you eat chocolate, chicken or chicken eggs, and peanuts, you are eating gifts from the rain forest.

Because of their beauty, acoustic properties, and workability, rainforest hardwoods have long been favorites with instrument makers and musicians. But now, with the world's rainforests threatened by clear cutting and burning, some craftspeople are turning away from traditional materials and taking a hard look at native woods.

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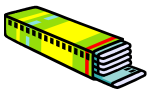
Cattle ranching remains a very important industry in Brazil and is becoming even more vital to the Brazilian economy. The Brazilian commercial cattle herd is the largest in the world. For every 1/4 lb hamburger consumed in the US from rainforest beef, about 55 square feet of rainforest was cleared.



Gum was first made using chicle, a naturally occurring substance from the Sapodilla Tree, found in the rain forests of Central America. There are even people, called "chiclero's," whose job is to harvest the chicle sap from living trees every 4 or 5 years. This doesn't harm the trees one bit, and gives the trees time to grow and produce more sap. There are still companies using chicle for gum today.

Carrying Capacity is the population level that can be supported for an organism, given the quantity of food, habitat, water and other life infrastructure present.

It is possible for a species to exceed its carrying capacity, in which case mass fatalities will occur as shortages in food and water take effect. This is often considered more devastating for a population as it produces stress for the entire species, and populations can fall far below the carrying capacity.