CINCINNATI ZOO & BOTANICAL GARDEN

Frisch's Outreach: Rainforests (Gr.1-3) Extensions

At a glance

This program will enable the students to discover the wonders of the rich and diverse Tropical Rainforest habitat

Goal

This class is designed to familiarize students with the richly diverse life found in Tropical Rainforests.

Objectives

1. Students will be able to tell that Tropical Rainforests have high amounts of rainfall and hot, steamy temperatures.

2. Students will be able to name the four layers of the Tropical Rainforest.

3. Students will be able to name at least three animals or plants that inhabit the Tropical Rainforest.

4. Students will be able to identify at least three household products or foods that come from a Tropical Rainforest.

5. Students will begin to develop an interest and respect for wildlife.

Theme

The Tropical Rainforest is a very important and diverse biome of the world.

Sub-themes

1. Tropical Rainforests are rich habitats for a widely diverse group of plants and animals.

2. Tropical Rainforests offer many foods and products that we enjoy in our homes.

Academic standards

Ohio Science Academic Content Standards	*Grade One* Earth Systems 1 Processes That Shape the Earth 3 Life Sciences *Grade One* Characteristics and Structures of Life 1 Diversity and Interdependence of Life 4

	Grade Two Characteristics and Structures of Life 1,2,3 Diversity and Interdependence of Life 5,6 *Grade Three* Diversity and Interdependence of Life 2,6
Kentucky Core Content—Science	*Grades K-Grade 4* Characteristics of Organisms SC-E-3.1.2, SC-E-3.1.3 Organisms & Their Environments SC-E-3.3.2

Background

Rainforests are places on Earth that hold many secrets that we are just beginning to discover. The amount of rainfall a forest experiences in one year will determine if that forest can be categorized as a Rainforest or not. A Rainforest usually receives 140-170 inches of rainfall per year. A forest in Ohio and Kentucky usually sees about 40-60 inches per year.

There are two types of Rainforests- Tropical and Temperate. Tropical Rainforests are located along the Tropic of Cancer, in South America, Africa, and Asia (along the equator). Temperate Rainforests are found in cooler climates.

When comparing Tropical Rainforests and forests found in other areas of the globe there are distinct differences. The average year round temperature is usually 80 degrees in a Tropical Rainforest while a Temperate Forest sees a range of temperatures averaging between 70-40 degrees.

When comparing Tropical Rainforests to Forests, the number of plant and animal species number in the hundreds in a Tropical Rainforest while Temperate Forests may have only about 30 species in an area of the same size.

In a Tropical Rainforest, most of the nutrients are stored in plants. Because of the high humid temperatures there is a faster rate of plant and animal decay which dictates very little plant growth in the poor soil of the Forest Floor. In a Temperate Forest because of slow decay and turnover of nutrients the Forest Floor will hold more nutrients resulting in more plant growth.

When focusing on the Tropical Rainforest as a habitat for such a diverse group of plants and animals it is helpful to understand the different levels of the Tropical Rainforest. Each plant and animal plays their role in the community of the Tropical Rainforest. Some will dwell only in one level but some can be found or will travel among different layers. Some will appear at the same layer as other animals but they may choose a different time of day.(Diurnal, Nocturnal, Crepuscular)

The Forest Floor is not lush because most nutrients are stored in the plants of the Forest. Because of their shape and waxing coating broadleaf plants will allow rain water to drip to the ground. Very low levels of light are found at the Forest Floor because of the vast vegetation above. Fungi, ferns, Centipedes, Leaf Cutter Ants, Cockroaches, Okapi, Elephants, Sumatran Rhinos, and Gorillas all can call the Forest Floor their home. Terrestrial animals can find their niche in the Rainforest community.

The Understory can be described as the next layer of the Tropical Rainforest. Here Red-Eyed Tree Frogs, Ocelots, Boas, and Spectacled Bear can be found. Lianas (rope like plants) grow from the

Forest Floor and continue to grow toward higher levels. At times they can become so heavy that trees can be pulled down by their weight.

The next layer, the Canopy, will experience tiny slivers of light which pass through the "umbrella" of trees that grow so close to one another. Here Hornbills, Parrots, Colobus Monkeys, Spider Monkeys, Lorises, Potto, Gibbons, Fruit Bats, and the Blue Morpho Butterfly add much to the Tropical Rainforest community. Some of these arboreal animals will spend their entire lives in the trees without ever touching the ground. Many of these animals are vital seed dispersers which keep the forest constantly renewing itself.

Some plants and animals have their own tiny ecosystems in the Canopy. Epiphytes, plants that seem to grow in air, grow in the spots where decomposing leaves drop. They require no soil but find all their nutrients in the small areas of dropped leaf decomposition. Poison Arrow Frogs will use upturned plants (Bromeliads) that collect rainwater for their nurseries and as a safe haven.

The Emergent Layer or roof of the Tropical Rainforest is the least known or explored, but some scientists are beginning to find ways to uncover the secrets there. Here the very tops of the tall trees catch the most sun to make this area of the Tropical Rainforest the hottest of all of the Layers. Along with numerous Insect species (many scientists estimate there are hundreds yet to be discovered) Hornbills, Harpey Eagles, Philippine Monkey Eaters, and Colobus Monkeys move among the very top of the trees.

Indigenous peoples also inhabit the Rainforest. The Ituri people of the Ituri Forest, the Penan of Borneo, and the Aymara of South America have an intimate relationship with the Tropical Rainforest. The forest gives them everything they need -shelter, food, and medicine. Shamans (usually older males) have uncovered the secrets of plants to heal and remedy ailments. This information is passed on orally and only recently have Western physicians trekked to the Rainforest to learn of that knowledge from these peoples. It is estimated that at least 1/3 of all Western Medicines have Tropical Rainforest components. Besides Medicines, many of our foods and household products come from the Tropical Rainforest.

Tropical Rainforest hold incredible plant and animal diversity. They store Carbon Dioxide, moderate temperatures, and prevent soil erosion. They are homes for many Northern Hemisphere birds during our winters. We know Tropical Rainforest hold many wonders and benefits for our world. How many other secrets do they hold?

Vocabulary

Arboreal-living in or among the trees

Bromeliads-tropical plants found in the Tropical Rainforest that have upturned leaves that catch falling rain.

Epipyhtes-plants that seem to grow "in the air". They need no soil. Humidity and decomposing leaves provide their nutrients.

Equator-the imaginary great circle around the Earth that is the same distance from the North and South Poles and divides the Earth into the northern and southern hemispheres

Layers of a Rainforest

Forest Floor-the first layer of the Rainforest, beneath the Understory, very little sunlight, poor nutrients in the soil

Understory-the middle layer of the Rainforest between the Forest Floor and Canopy

Canopy-"umbrella of trees", the upper layers of the forest that block the light from the forest floor

Emergent Layer-the very top of the Rainforest trees, exposed to the most sun

Lianas-woody stemmed climbing vines

Terrestrial-living or growing on land rather than in the sea or the air

Tropical-very hot and often combined with a high degree of humidity

Extensions

There is a Tropical Rainforest in our kitchen! Research the different ingredients and products found in our kitchens that originate in the Tropical Rainforest. Use some of those items to create tasty recipes! Can you have a Rainforest Bake Sale? What could you do with the profits?

Wish You Were Here! Write a Postcard from the Tropical Rainforest! Become an animal from the Tropical Rainforest. Tell about where you live in the Tropical Rainforest and what you are doing! How do you help the Tropical Rainforest Community?

Create a Tropical Rainforest mural! Try to depict all of the Layers of the Tropical Rainforest. Be sure to show as many of the diverse plants and animals as you can!

Be a North American Songbird! Choose to learn about one of our native songbirds that winters in the Central or South American Rainforests. Write in a journal telling why you leave your home here during the winter. What route do you take? Where do you finally stop on your migration route? What is your winter home like? Who are your neighbors? Can you add drawings to your journal entries?

Resources

Denslow, Julie S. and Padoch, Christine, People of the Tropical Rainforest, University Press, 1988.

Forsyth, Adrian and Miyata, Kenneth, Tropical Nature,Charles Scribner Sons, 1987

Louv, Richard.Last Child in the Woods:Saving Our Children From Nature Deficit Disorder. Alogonquin Books, 2005.

Sobel, David, Beyond Ecophobia, Reclaiming the Heart of Nature Education, Orion, 1995

Websites:

ALA's Great Websites for Kids: Animalshttp://www.ala.org/gwstemplate.cfm?section=greatwebsites&template=/cfapps/gws/displaysection.cfm&sec=1

Awesome Library – Kids http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html

Awesome Library – Teachers http://www.awesomelibrary.org/Classroom/Science/Animals/Animals.html

Cincinnati Zoo & Botanical Garden
www.cincinnatizoo.org

National Geographic Kids
kids.nationalgeographic.com

ENature
www.enature.com