



Did you know?
The largest river in the world, the Amazon River, was created as the Amazonian basin and the Andes mountains shaped the flow of water to the Atlantic Ocean.

The Rainforest Chorus

The Approach

Billy utilizes comprehensive sensory integration through song, dance, audience participation and a multi-dimensional backdrop to connect performance attendees to the unique world within the tropical rainforest. Scientific concepts are presented in an accurate and reliable manner as the vital importance of the rainforest to the ecology of planet earth is presented.

The Brazil nut tree, agouti, and panther are just a few of the exotic plants and animals that are discovered as the audience gets a glimpse at the abundance of life in the equatorial rain-forest environment.

The Objective

Students will grasp the complexity of life in the rainforest and exhibit an increase in vocabulary as they sing along with songs like the "Squads of Arthropods" and dance like the "Epiphytes".

Older students explore further as they learn how tectonic plate shifts relate to the rainforest, the relevance of symbiosis and more.



The Result

Teachers shared that this was one of their favorite assemblies. They particularly enjoyed the fact that the students were actively involved and they were delivered an important message through educational and catchy songs. One teacher commented that Billy B "had the kids singing, dancing and all around having a great time while they were learning".

Assistant Principal

Suggested Pre-Performance Activities

Discuss the following concepts with students:

1. Tropical rainforests are what movies and books often refer to as "the jungle".
2. Water never freezes into ice because of the rainforest's equatorial location and the direct rays of the sun.
3. These forests are called rainforests because of the significant amount of rain they receive, in contrast to the forests in the United States.
4. The rainforests are made up of different types of trees, plants, animals, and insects. Yet we share, because of migration, some of the same birds.

The Rainforest Chorus In the Classroom

Vocabulary Words

Grades K-2

arachnids - one of the types of arthropods that include spiders, scorpions, ticks, and mites, all of which have eight legs.

arthropods - a large group of animals having jointed legs and bodies that are divided into parts. Examples are spiders, crabs, and insects.

camouflage - the devices that animals use to blend into their environment in order to avoid being seen by predators or prey, especially coloration.

canopy - the uppermost layer of the forest. In the rainforest, it is a mass of treetops, vines, and other plants, rising 100 to 130 feet above the forest floor. Many animals live there.

chorus - a group of people or animals all speaking or making a noise together.

commensal - describes a relationship between organisms of two different species in which one derives food or other benefits from the association while the other remains unharmed and unaffected.

condensation - to change from a gas or vapor to a liquid. Dew is a condensation of water vapor from the air. Condensation often happens when water evaporates or transpires from leaves into the air, cools as it rises into the upper atmosphere, then condenses and falls back to the earth as rain.

continents - any of the seven large continuous land masses that constitute most of the dry land on the surface of the Earth. They are Africa, Antarctica, Asia, Australia, Europe, North America, and South America.

crustaceans - one of the types of arthropods, all of which have a hard shell, a jointed body, and live mostly in water. Includes lobsters, crabs, shrimp, crayfish, and barnacles.

epiphytes - a plant living in commensal relationship on another plant, deriving only support; nutrients are obtained from moisture and dust in the air. They often collect pools of rain water in their center, providing habitat for many living things.

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

exoskeleton - an outer rigid body (crab-like shell) covering with appropriate joints, against which the locomotory muscles exert their force.

extinction - when a certain group of animals or people no longer exist, having died out completely.

limbs - a branch of a tree.

pollinate - the joining of male & female cells from the same plant or related ones to produce seeds. In general, pollination is when one grain of pollen is carried, by wind or animal, to a receptive flower where it grows into a flower to produce seeds.



sloth - a common, large rainforest mammal that may have the biggest biomass (the combined weight of all living mammals) in some areas of the rainforest. They live in trees and move extremely slowly.

territory - an area that an animal considers as its own and that it defends against intruders of the same species.

trunk - the main stem of a tree, excluding branches and roots.

warning -

water cycle - on earth, water from the ocean and other bodies of water becomes heated from the sun, evaporates, rises as a gas (water vapor), is cooled in the atmosphere, condenses into clouds or fog, and comes down as rain or snow onto the earth's surface. The water then seeps deep into ground water, resupplies the water table, and finally flows back into bodies of water, to be repeated again.

Grades 3-6

In addition to the above vocabulary, students in grades 3-6 will also gain knowledge of the following terms:

agouti - a rainforest mammal in the rodent group that looks a little like a rabbit with short ears or a large squirrel without a tail.

Andes Mountains - the long mountain chain which runs down the entire length of western South America.

biodiversity - describes the variety of life forms (plant & animal) and their roles in the ecology, or workings, of an ecosystem. Biodiversity is the key to the maintenance of the world as we know it.

decompose - to break down organic matter from a complex to a simpler form, mainly through the action of fungi and bacteria, or be broken down in this way.

nutrients

ecosystem - a community (all living plants and animals) and the nonliving environment where they are found function together as an ecosystem. The rainforest is an ecosystem.

evolve - to change in accordance with the scientific theory of evolution, that all living things came from fewer and simpler forms of life, that these forms changed over millions of years into the many different forms that exist on earth today.

habitat - the physical part of an ecosystem occupied by a species.

species - a group of plants or animals that have certain common features which set them apart from others. The male & female of a species of animal can mate together to produce young that will resemble the parents.

Post Performance Activities

1. Locate the equator on the globe. Ask students to locate their town with respect to the equator. Where would the sun appear from their perspective in the sky (given your latitude) in the summer? In the winter? How would this differ if your school was located on the equator?
2. Using a globe and a ball for the sun, see if you can replicate the relative positions of the earth and sun during different seasons. Describe how seasons are a result of how the earth spins on its axis and revolves around the sun at an angle. Have students note the difference of the sun's location if living at the equator

versus living at successively higher latitudes. Follow up by going outdoors on a sunny day at noon and plotting the students' shadows. Repeat this process during different seasons of the year. Note the differences. Where would their shadows be if they lived on the equator? How does this relate to climate? These activities should give the students a basis for understanding how the sun affects the climate at the equator all year long. Rainforests are located around the world, near the equator.

3. List the ways in which nature prepares for winter. For example: migration, hibernation, and adaptation to a temperature reduction. Ask students if rainforest species have to prepare for winter? What are other challenges of the rainforest environment to which they must adapt?
4. Discuss the water cycle. To view the processes of transpiration and condensation try the following exercise. Place plastic bags somewhat tightly over two plants, a cactus and a leafy plant such as a fern. Check the bags after the plants have been in the sun during the day. What do you find on the inside of the bag? Note that there is less moisture on the inside of the bags first thing in the morning as the process of transpiration is halted during the night. This demonstrates how plants give off water and contribute to the water cycle.
5. To demonstrate the concept of camouflage, try the following game, either outdoors or indoors. Take a collection of different colored toothpicks (25 of each color) and hide them in a given area. Students should be shown the boundaries and given a brief length of time in which to find as many toothpicks as possible. Afterwards, graph the results of how many of each color were found. Discuss why certain colors were more difficult to find. Discuss the purpose of camouflage and why there are some very bright colored animals that are not camouflaged? Bright colors are sometimes used to mimic other animals who are unattractive to predators, and they gain their protection from predators by mimicry (i.e., some animals have evolved to mimic poisonous species, thus are protected from predators who avoid the poisonous species.)
6. See if you can discover which of your local migrating bird species winter in the rainforest.
7. Purchase some whole sugar cane and some tropical fruits such as mangoes, papaya, and star fruit to share with your students.
8. Calculate the following: If we lose 3,000 acres of rainforest in an hour, how many do we lose in a minute? In a second? Use an encyclopedia to find a part of our United States that is close to 3,000 acres.
8. Make a cooperative classroom rainforest mural with as many aspects of the rainforest as possible.

Teacher Resources

1. **Rainforest Chorus - Teachers Guide** <http://billybproductions/teachers/RainforestChorus.html>
2. **"Tropical Rainforest 24"x18" poster & accompanying guide"** available from Sharon Audubon Center, Route 4, Box 171, Sharon, CT 06069. (Request on school letterhead, cost \$12.) 203- 364-0520
3. **Teacher's Rainforest Packet** from WORLD WILDLIFE FUND, 1250 24th St. N.W., Washington, D.C. 20037. Supplies may be limited: call to assure adequate supply. 202-293-4800
4. **"Rainforests: A Teacher's Resource Guide"** 28-page, comprehensive resource guide (with a few activities) of books, videos, films, organizations, articles, addresses, and anything else imaginable, by Lynne Chase. \$5 from Rainforest Action Network, 301 Broadway, Suite A, San Francisco, CA 94133. 415-398-4404

National Science Education Standards

Rainforest Chorus conveys connections to the following standards:

Science as Inquiry

- _ Understanding about scientific inquiry

Physical Sciences

- _ Position and motion of objects
- _ Transfer of energy

Life Sciences

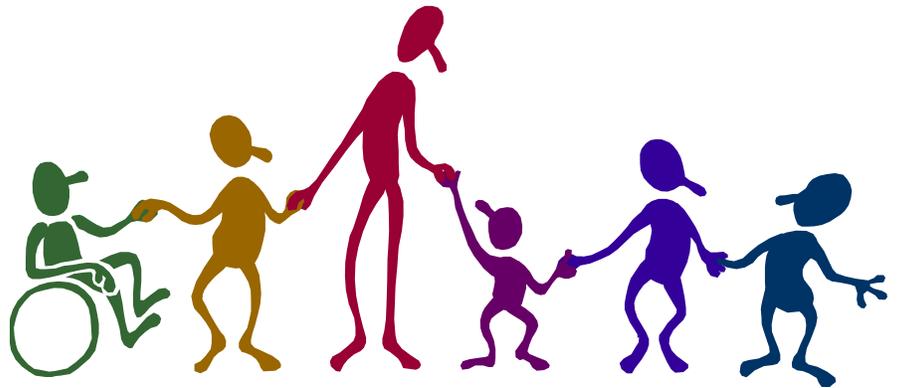
- _ Characteristics of organisms
- _ Life cycles of organisms
- _ Organisms and environments
- _ Structure and function in living systems
- _ Reproduction and heredity
- _ Populations and ecosystems
- _ Diversity and adaptations of organisms

Earth and Space Sciences

- _ Earth in the solar system
- _ Structure of the earth system

Personal and Social Perspectives

- _ Types of resources
- _ Changes in environments
- _ Populations, resources, and environments
- _ Characteristics and changes in populations



National Research Council. *National Science Education Standards*. Washington, D.C.: National Academy Press, 1996.