

## Activities

- Read interesting excerpts from Charles Darwin's *Voyage of the Beagle* to the class. Ask students to imagine what it would be like to be a naturalist in a newly-discovered ecosystem. Have students research Darwin's life and work, and have them write a report describing his influence on our current understanding of biodiversity and adaptation.
- Research what is meant when one says that the Amazon Rainforest is the "lungs of the world."
- Use the "Rain Bird Rain Forest" online curriculum found at [www.rainbird.com/rainforest](http://www.rainbird.com/rainforest) to find activities and demonstrations for use in the classroom for teaching scientific aspects of the Earth's endangered rainforests.
- Find 20 examples of interdependence in the rainforest and create a classroom web mural depicting the organisms.

## Internet Resources

Periodically, Internet Resources are updated on our web site at [www.libraryvideo.com](http://www.libraryvideo.com)

- [www.nybg.org/chil\\_edu/teachersguide](http://www.nybg.org/chil_edu/teachersguide)  
The New York Botanical Garden has been a living museum of plants since the end of the 19<sup>th</sup> century. These pages feature teacher guides and student activity booklets that are downloadable and easily adapted for classroom use.
- [www.centerforplantconservation.org/peril/perilmnu.html](http://www.centerforplantconservation.org/peril/perilmnu.html)  
"Plants in Peril" is an online guide that explores biodiversity and rare native plant conservation for middle school educators, and was developed by the Center for Plant Conservation at the Missouri Botanical Garden.
- [www.amazonrainforest.org](http://www.amazonrainforest.org)  
Amazon International Rainforest Reserve takes viewers into the Amazon.
- [www.enchantedlearning.com/subjects/rainforest/](http://www.enchantedlearning.com/subjects/rainforest/)  
Zoom Rainforests from the "Enchanted Learning" web site contains a wealth of information on many creatures that make the rainforest their home.

## Suggested Print Resources

- Halfman, Janet. *Plant Tricksters*. Franklin Watts, New York, NY; 2003.
- Glover, David. *How Do Things Grow?* DK Publishing, New York, NY; 2001.
- Oldfield, Sara. *Rainforest*. MIT Press, Cambridge, MA; 2003.
- Patent, Dorothy. *Biodiversity*. Clarion Books, New York, NY; 2003.
- Souza, D. M. *Endangered Plants*. Franklin Watts, New York, NY; 2003.

### TEACHER'S GUIDE

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### TITLES IN THIS SERIES

- ARCTIC & ANTARCTIC
- DINOSAUR
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- RAINFOREST (JUNGLE)

Teacher's Guides Included  
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## Rainforest (Jungle)

### Grades 4–8

The *Eyewitness DVD Series* explores the natural world with fascinating film footage and nature photography fused with striking special effects and stunning graphics. The programs offer a unique "eyewitness" view of events that shape the Earth and the living things that inhabit it.

Interactive menus allow viewers to easily select and replay any section of a program. Other features include interactive assessment quizzes and "Hotspots" — video icons that appear throughout the program and allow students to further explore specific science content or areas of interest. Each title contains a segment that reveals all the behind-the-scenes wizardry that goes into the production of the *Eyewitness* series, along with recommended web sites for further research.

Included in this guide is a brief synopsis of the program, background on the science concepts presented in the show, discussion topics, activities, vocabulary and additional resources for students to explore.



## Background

Although millions of years ago tropical rainforests covered much of the planet, today they cover only six percent. Though greatly reduced in size, rainforests still contain almost half of all the plant and animal species on Earth. Full sun all year, warm temperatures and plentiful rainfall and humidity make tropical rainforests a biome that produces lush vegetation and the greatest diversity of species of all biomes. With so much heat and moisture, the rainforest is constantly recycling its water, like a giant water wheel lifting it into the sky and dumping it back down.

Millions of different species can exist in one rainforest ecosystem, with as many as 200 species living in one tree! This concentration of life is only possible because of the rainforest's multilayered habitats...nature's version of the high-rise apartment.

The forest floor has few plants but plenty of decomposers such as insects, fungi and bacteria that feed on decaying plants and animals and recycle nutrients. Streams and rivers are filled with river dolphins and scores of fish. The soil of the rainforest is relatively poor in quality because nutrients are immediately absorbed again by plants or washed away by rainfall.

The next level in the rainforest is the understory, which receives only seven percent of the available sunlight, and consists of small trees and shrubs that are adapted to low-light conditions. Plants here typically have broad leaves in order to catch infrequent rays of sunlight and to funnel rain that drips down from above. At this level, many animals, such as snakes, frogs, birds and insects, have developed amazing colorful adaptations that allow them to blend in with their surroundings and avoid predators.

The dense canopy level is next, where most of the plants and animals live. Each organism is adapted to occupy a unique place in the rainforest. Epiphytes are plants that have aerial roots, allowing them to attach themselves to tall trees high in the canopy to get sunlight, while absorbing moisture out of the humid forest air. Lianas are climbing plants like vines that root in the ground and grow up trees, strangling some in the process. Animals such as monkeys, parrots and sloths spend their entire lives in the canopy. The notion of the impenetrable jungle dates back to when the first explorers traveled into the rainforest on boats. Along the river banks, they saw tangled walls of plants and vines that flourish wherever the sun pierces the canopy. Assuming that the entire rainforest looked the same, they named it after the Sanskrit word for thick vegetation, *jangala*.

The highest layer of the rainforest is the emergent level, with treetops rising up to 76 meters (about 250 ft.) into the sunlight.

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The tropical rainforest's biodiversity is so vast that, even today, it remains largely unexplored. Since the beginning of the 20<sup>th</sup> century, though, the rainforest has been diminished by half. At present rates of destruction, it will have gone altogether by the middle of the 21<sup>st</sup> century. It was once written, "The forest is a peculiar organism of unlimited kindness and benevolence that makes no demands for its sustenance and extends generously the products of its life activity; it offers protection to all beings, giving shade even to the axe man who destroys it."

The writer was Buddha...who received enlightenment under a fig tree.

## Vocabulary

**adaptations** — Inherited physical features or behaviors that enable an animal to survive in its environment.

**co-evolution** — The process by which many species have evolved in tandem in order to gain mutual advantage. This is the case with the swordbill hummingbird and the datura flower. The bird's long beak has evolved to reach the nectar hidden deep in the flower.

**botanist** — A scientist who studies plants.

**camouflage** — The ability of some animals to blend in with their environment.

**chlorophyll** — The green pigment found within the chloroplasts of plant cells that absorbs sunlight used in the first step of photosynthesis.

**common periwinkle** — (*Vinca minor*) A rainforest plant known as the "sorcerer's flower" that contains an alkaloid used in cancer therapy, which has raised the survival rate of childhood leukemia from 20 to 80 percent.

**competition** — The struggle among living things for enough water, food and living space.

**epiphyte** — A plant that does not grow in soil but is often found growing high above the ground on another plant.

**equator** — An imaginary circle around the Earth, equally distant at all points from the north and south poles. It divides the Earth into two halves — the northern and southern hemispheres.

**evolution** — A theory that all types of living organisms have their origin in other preexisting types and that the differences among them are due to small changes in individual animals over many generations.

**habitat** — The area in which a plant or animal lives.

**native plant** — A plant living in its natural environment.

**latex** — The milky white juice of the hevea tree that is the basis for natural rubber.

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**pollination** — The transfer of male reproductive plant cells (pollen) to the female reproductive organ of a flower where the pollen fuses with an egg cell to produce a seed.

**rafflesia** — A leafless plant found on the forest floor. Commonly known as the "stinking corpse plant" because it smells like rotting meat, it is irresistible to pollinating flies and steals nutrients from climbing vines.

## Discussion Topics

- If a tropical rainforest is considered a paradise for plants, discuss why a cactus plant would die if it was transplanted there.
- Discuss some of the specialized adaptations of plants and animals that make survival in their specific habitats possible through unique, species-specific relationships.
- What makes a relationship interdependent?
- How do animals help flowering plants?

## Focus Questions

1. Who were the Mayans? What relationship did they have with the rainforest?
2. What percentage of the world's plant species can be found in tropical rainforests?
3. What are the levels of a rainforest?
4. What does the word 'jungle' mean?
5. Describe river dolphins and the stories told about them by Amazonian natives.
6. What flower was known as 'the flower of death'?
7. How is the mountain gorilla different from King Kong?
8. How have epiphytes like bromeliads and some orchids adapted to life in the rainforest?
9. How do some organisms provide habitats for other organisms?
10. What adaptations have carnivorous plants made to survive?
11. Describe the highest order of Aztec warriors. What animal and what plant was most important to them?