

FOREST OF UCO

Classroom Activities



PHOENIX ZOO®

Part of the Community. Part of You!

Layers of the Rainforest Activity

Materials

- ② Construction paper – assorted colors
- ② Tissue paper – brown, green
- ② Variety of markers, colored pencils
- ② Tagboard
- ② Scissors, rulers, glue
- ② Reference materials: encyclopedias, wildlife magazines, etc.

Activity

Students use reference materials to research the levels of the rainforest. They then use construction paper and tissue paper to “construct” a rainforest model on a bulletin board or hallway wall.

Divide the class into four teams, “Emergent Layer League”, “Canopy Crew”, “Understory Squad”, and “Forest Floor Friends”. Each team is responsible for creating the plants, animals, and landscape features of their section of the rainforest.

Using reference materials or purchased coloring books, students can draw or trace various species of rainforest insects, reptiles, amphibians, and mammals. Once these animals are colored, they can be placed in the appropriate level of the rainforest display.

Layers of the rain forest

Here are some examples of plants and animals found in each layer to use as reference.

Emergent Layer

Vegetation: Trees as tall as skyscrapers emerge from the top of the forest. Trees are widely scattered. They tend to be very straight, with just a few lower branches and leaves to intercept sunlight.

Animals:

Great hornbill	Pygmy glider
Birdwing butterfly	Harpy eagle
Proboscis monkey	Toco toucan
Howler monkey	Giant morpho butterfly
Hyacinth macaw	

Canopy Layer

Vegetation: The tops of closely spaced trees form a dense leafy roof over the forest below. The canopy captures most of the sunlight and keeps the lower layers in deep shade. There are many flowers, fruits, and leaves to eat. Be sure to include some bromeliads and ferns!

Animals:

Gibbon	Hummingbird
Flying lemur	Paradise tree snake
Golden lion tamarin	Blue bird of paradise
Tree porcupine	Opossum
Tree anteater	Iguana
Katydid	Three-toed sloths
Black spider monkey	Wallace’s flying frog
Red howler monkey	Spectacled owl
Parrots, including macaws	

Understory Layer

Vegetation: Woody plants, shrubs, and young trees grow here, shaded by much bigger trees. In time, a few of them will grow tall enough to be part of the canopy.

Animals:

Great curassow	Tree kangaroo
Emerald tree boa	Aye-aye
Prehensile-tailed porcupine	Ocelot
Boat-billed heron	Four-eyed opossum
Coati	Zebra butterfly

Forest Floor Layer

Vegetation: The air is still and moist in the darkest part of the forest. Ferns, moss, and dead leaves cover the ground. Vines grow upward, climbing up trees in search of sunlight.

Animals:

Tapir	Land crab
Fungi	Bullet ant
Agouti	Anaconda
Giant armadillo	Poison arrow frog
Beetles	Satin bowerbird
Jaguar	Margay

Decorative hints

Your indoor rain forest can be made more interesting by making some of the display three-dimensional. Here are some ideas to help you start off!

- ① Try using bare branches with tissue paper leaves attached.
- ② Stuff newspaper behind tree trunks made of tissue paper.
- ③ Bromeliads can be made by covering empty toilet paper rolls with layers of construction paper leaves.
- ④ Use florist's wire glued to the back of construction paper or tissue paper fronds to make ferns.
- ⑤ Make flowers with tissue paper and florist's wire.

Raindrops keep fallin...

Getting Started

The most fundamental characteristic of a rainforest is, of course, abundant rainfall. The wettest place on earth, Cherrapunji, India, receives an average of 430 inches of rain per year. The driest place on earth, found in a region of the Atacama Desert of northern Chile, has never had recorded rainfall.

This is a simple activity which will allow you to demonstrate the tremendous differences in rainfall in various regions of the world.

Materials

- ④ (3) two-liter bottles (clear plastic bottles with the labels peeled off work best)
- ④ a graduated cylinder or measuring cup
- ④ water

Procedure

Label each of the bottles with a different geographic area and fill them with water according to the following table:

Phoenix, Arizona receives 7.6 inches of rain per year
Fill bottle with 112 ml or 3.8 oz of water

Seattle, Washington receives 35.2 inches of rain per year
Fill bottle with 520ml or 17.6 oz of water

Iquitos, Peru receives 113.4 inches of rain per year
Fill bottle with 1677ml or 56.7 oz of water

Discuss with students the differences in plant and animal life associated with different amounts of rainfall. What would happen if the rainfall in Phoenix suddenly doubled? What if it was cut in half?

Behavioral Observations

Goals

- ④ Learn what behavioral observation is.
- ④ Understand the information that can be gained through behavioral observation.

Materials

- ④ Pencil
- ④ Paper
- ④ List of questions
- ④ Jigsaw puzzle (use one or several -choose some that are age appropriate for your class and won't take too long or too short of a time to put together)

Procedure

1. Divide students into pairs. Have each pair decide who will be the observer first.
2. Have all the observers sit at their desks with pencil and paper. Their job is to write down everything they see their partners doing. Include body movements, body language, emotional expressions, facial expressions, etc.
3. All the students that are not observing will as a group attempt to put a jigsaw puzzle together (or any similar activity that you would like to substitute). You can also divide them into smaller groups and have each group work on a different puzzle.
4. Once the puzzle is together (or whenever you decide to stop) allow the observers a few minutes to answer the list of questions and then switch.
5. Afterward have a discussion about what the students learned during their observations.

Questions

Were there any behaviors, emotions, that you saw exhibited more than others?

Were there people in the group that your partner seemed to get along with? What observations lead you to this conclusion?

Were there people in the group that your partner seemed to not get along with so well? What observations lead you to this conclusion?

Does your partner like to stay in one spot or move around a lot?

How would you describe your partner's overall personality?

Do you think your partner liked or disliked this experience? Why?

In Disguise

Getting Started

In the rain forest, animals and plants use special tactics to avoid predators and to catch prey. Give some examples of camouflage and mimicry: Katydid can mimic twigs, moths, and bark. Some butterflies shut their wings to look like dried leaves and then open them to flash bright camouflage and colors to startle predators. Algae growing on a sloth's fur helps to camouflage the sloth while it eats leaves; in turn, the sloth camouflages moths, beetles and ticks living in its fur. Passion flower vines mimic the eggs of heliconia butterflies in order to discourage butterflies from laying eggs on them. Rain forest animals' anatomy and behavior is also suited to help them live in their environment.

YOU'RE ALL THUMBS

Ask students why birds can fly and we can't. Why can't we leap and swing among trees with the same balance and ease of the howler monkey? Do humans have any interesting adaptations which help us to live efficiently? Play a quick game with students to show why our opposable thumbs are such an important appendage. Have students tape their thumbs to their hands. Then ask them to try to write their names with a pencil, pick up paper, open a book and turn pages, and attempt to tie shoelaces. It's not such an easy task without those helpful little thumbs!

DESIGN AN ORGANISM

Goals

- ④ Learn how and why animals use protective coloration
- ④ Learn about camouflage and mimicry in nature
- ④ Learn about survival skills and partnerships in rainforests
- ④ Create a fictional organism, adapted to its habitat

Materials

- ④ Paper
- ④ Fabric
- ④ Glue
- ④ Paints, markers
- ④ Pipe cleaners
- ④ Any other available materials

Procedure

Ask students to design a fictional plant or animal which is adapted to their own school yard environment. Take a walk outside to help students brainstorm the kinds of creatures they might want to make. Then, using readily available art materials have students create their fictional organisms.

Students may want to team together to create organisms that depend on one another for survival, such as plants that live on other plants, or insects that protect host plants, and vice-versa. Encourage creativity and humor!

Have students also invent a name for each organism, a description of its preferred habitat, a list of what it eats, its natural enemies, and special adaptations, such as camouflage, mimicry, special appendages, and behavior. When complete, have students hide their creations, one at a time, somewhere on the school yard. Once hidden, the class can search. As each creature is found, ask its creator to explain its adaptations. (For example, if it was found in a tree, the organism will need to have been made with claws for climbing, wings or other structures to enable it to get up into the tree. If a plant is growing in an unlikely place, there needs to be a logical explanation about how the plant gets food and sunlight).

Additional Resources

Bailey, Jill. *Mimicry and Camouflage*. BLA, 1988.

Hess, Lilo. *Animals That Hide*. Scribner, 1970.

Kudlinski, Kathleen V. *Animal Tracks and Traces*. Franklin Watts, 1991.

Norsgaard, E. Jaediker. *Nature's Great Balancing Act: In Our Own Backyard*. Dutton, 1990.

The Great Cover-Up: Animal Camouflage, National Geographic.

Wild Survivors: Camouflage and Mimicry, National Geographic.

Visit the PBS Science in the Rain Forest site. http://www.pbs.org/tal/costa_rica/

Visit the U.S. Fish and Wildlife Service site to learn about endangered and threatened species.
<http://endangered.fws.gov/>

Take action

"Never doubt that a small group of thoughtful, committed citizens can change the world. Indeed it is the only thing that ever has." (Margaret Mead)

Goals

- 🌐 Organize an educational fair.
- 🌐 Work collaboratively
- 🌐 Summarize and synthesize information to educate others
- 🌐 Learn that individuals working together can create positive change

Materials

- 🌐 Construction paper
- 🌐 Cardboard
- 🌐 Paints
- 🌐 Markers and crayons
- 🌐 Scissors

Getting Started

Many people use the phrase "think globally and act locally." Ask students what they think this means. What are some of the things that they can do as individuals and as a class to help stop rain forest destruction? You may want to contact the Rainforest Action Network (RAN) for free information on the actions students can take.

Have students work in groups to organize an educational fair filled with information booths, games, tree plantings, a food fund-raiser, and an exhibit of students' writing and artwork related to the Forest of Uco. Be sure to create posters to publicize the event. If your school has a public-address system, create radio commercials to advertise the fair. Invite parents to participate and to learn how their energy-use habits have an effect on the survival of rain forests. You might even want to let the local media know what you are doing so that they may cover the story and educate others.

INFORMATION BOOTHS

The goal of these booths is to share with others the information students have learned from their study of the Forest of Uco and to encourage others to visit there. Students may want to distribute lists of actions that children, their parents, and the school can take to help stop rain forest destruction. Examples include not buying any tropical hardwoods unless they are labeled as being from sustainable sources; buying products that use ingredients grown in rain forests; buying tree-free paper, and boycotting companies that profit from destroying the forests. Students may want to prepare fact sheets about tropical flora and fauna, global endangered species, and indigenous groups living in the forest.

GAMES WITH A MESSAGE

Teams can organize games (e.g., beanbag toss, knock down pins) that focus on how students can help save the world's rain forests by changing their own behavior right here at home. Game boards can be decorated with key information and suggestions for action. Game themes might include recycling and reusing, being an environmentally conscious consumer: and conserving fossil fuel energy (by carpooling, walking, and riding bikes) to reduce the need for more coal and oil extraction and building more energy plants.

TREE PLANTINGS

All trees absorb carbon dioxide and help provide shade which reduces the need for air conditioning. Talk with the school principal about where trees could be planted. Ask parent volunteers to supervise

FOOD FUNDRAISER

Make and sell delicious "treats" to raise money to donate to rain forest preservation groups. Students can make and sell such goodies as rain forest trail mix using nuts, spices, and fruits that grow in the Andes, banana bread, or even traditional South American delicacies

FOREST OF UCO MUSEUM EXHIBIT

Invite students to create a mini Forest of Uco museum for other students to view. Include all art projects, writing, dioramas, and illustrations that students have created throughout this unit. Two or three students can act as docents during the Rain Forest Fair. (If you have Internet access, students can publish a home page about their Fair and create links to The Phoenix Zoo, RAN, and other related sites.

SIMPLE THINGS KIDS CAN DO

Pack your lunch in reusable containers

Wash and reuse water bottles

Take only as much food as you think you can eat

Write on both sides of notebook paper

Use scratch paper for first drafts of homework

Shorten your shower time by one or two minutes

With parents permission, ride your bike, take the bus, carpool, skate, or walk to school

Recycle

Additional Resources

Bellamy, David. J. *How Green Are You?* Clarkson Potter, 1991.

Goodman, Billy. *A Kid's Guide on How to Save the Planet.* Avon/Camelot Books, 1990.

Goodman, Susan E. *Bats, Bugs, and Biodiversity: Adventures in the Amazonian Rain Forest.* Atheneum, 1995.

Lewis, Barbara. *A Kid's Guide to Social Action.* Free Spirit Publications, 1991.

The Earth Works Group. *Fifty Simple Things Kids Can Do to Save the Earth.* Andrews and McMeel 1990.

Visit the Conservation International site to learn about current strategies to help the rain forests, including rapid assessment teams, debt-for-nature swaps, and ecotourism. <http://www.conservation.org>

Have students visit the Rainforest Action Network site to learn more about what they can do.

http://www.ran.org/kids_action/index.html