



ZAP!

Zoo Activity Packet

Indonesian Rain Forest

A Teacher's Resource
for Grades 2-8

Indonesian Rain Forest

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Learning Objectives

This teacher resource packet has been designed for use with students before, during, and after a visit to the zoo. Background information on tropical rain forests and the Indonesian Rain Forest exhibit at the Fort Wayne Children's Zoo has been included to assist you in planning a study unit.

The work sheets and activities suggested in this packet will help students to:

1. List two reasons why tropical rain forests are important.
2. Identify two plants and two animals that live in tropical rain forests.
3. Describe at least two reasons why tropical rain forests are being destroyed.
4. Discuss two conservation activities that each student can do to help preserve tropical rain forests.

Indiana Academic Standards for Science

The Indonesian Rain Forest Zoo Activity Packet meets the following Indiana Academic Standards for Science:

2.1.2, 2.1.3, 2.1.5, 2.1.6, 2.2.4, 2.2.5, 2.3.4, 2.4.1, 2.4.2, 2.4.3, 2.4.4, 2.5.4, 2.5.6, 2.6.1, 2.6.2

3.1.2, 3.1.3, 3.1.4, 3.1.5, 3.1.8, 3.2.5, 3.2.6, 3.2.7, 3.3.5, 3.4.1, 3.4.2, 3.4.4, 3.4.5, 3.5.1, 3.6.1, 3.6.2, 3.6.3, 3.6.4, 3.6.5

4.1.5, 4.2.1, 4.2.6, 4.2.7, 4.4.2, 4.4.3, 4.4.6, 4.5.3, 4.5.5, 4.6.1, 4.6.2, 4.6.3, 4.6.4

5.1.6, 5.2.1, 5.2.4, 5.2.7, 5.3.5, 5.3.8, 5.4.4, 5.4.5, 5.4.6, 5.4.7, 5.5.1, 5.6.1, 5.6.4

6.2.7, 6.3.5, 6.3.9, 6.3.14, 6.3.16, 6.4.1, 6.4.2, 6.4.3, 6.4.8, 6.4.9, 6.4.10, 6.7.1, 6.7.2

7.1.8, 7.2.8, 7.3.16, 7.4.2, 7.4.8, 7.4.9, 7.7.1, 7.7.3

8.1.7, 8.2.7, 8.2.10, 8.3.6, 8.3.7, 8.4.8, 8.7.5, 8.7.7

Tropical Rain Forests : Background Information for the Teacher

What is a Tropical Rain Forest?

Tropical rain forests cover only 6 percent of the earth's land area, yet they are home to more than 50 percent (some say up to 90 percent) of the world's plant and animal species.

Tropical rain forests once circled the globe in an unbroken belt of green around the equator. In the last two hundred years, this belt has been fragmented into smaller pockets of green in South America, Africa, Asia and Australia.

There are many different types of rain forests. Some are found in North America (temperate rain forest). Some are semi-deciduous, some evergreen. In this packet we will be discussing only tropical rain forests, which lie between the Tropic of Cancer and the Tropic of Capricorn. Tropical rain forests receive between 60 to 400 inches of rain per year (compare that to the 36 inches received annually in northern Indiana). Temperatures usually stay between 70 and 85 degrees, varying little from day to night. Because they are close to the equator, tropical rain forests receive about 12 hours of sunlight each day year-round. High temperatures and abundant rainfall create a very humid environment. Humidity may range from 70 percent at night to 95 percent during the day.

Layers of Life

The plants of the rain forest are arranged in layers. The tallest of the trees are called *emergents*. These giants tower above the rest of the forest, sometimes reaching heights of 200 feet, but usually growing to about 115 to 150 feet tall. Many of these emergents have thick buttresses around the base of the trunk for stability.

The *canopy* of the rain forest is formed by trees that are 65 to 100 feet high. These trees form a continuous covering over the forest. The canopy is filled with life. The umbrella of branches and leaves provides a home for many rain forest creatures.

Below the canopy, in the *understory*, shrubs and vines grow to heights of 15 feet or so. Only 2 to 5 percent of the sunlight reaches the understory.

The *forest floor* is sheltered, still, and always humid. Vegetation is sparse due to the lack of sunlight and the rapid decay of dead plants and animals.

Trees of the Rain Forest

Most trees of tropical rain forests are evergreen – they do not lose their leaves each year because there is no change of seasons. The leaves of these evergreen trees are designed for the wet climate of the rain

forest; the leaves have a waxy covering to repel water and a pointed "drip tip" to speed the draining of water.

Trees of the rain forest have developed unique root systems. The roots underground are too shallow to support the immense weight of the tree. The trees instead may have stilt roots (such as palms) or buttress roots (such as the kapok tree).

Vines of the Rain Forest

A liana is a type of vine that sprouts on the forest floor, then climbs the side of a tree as it reaches for the sunlight. Lianas can reach lengths of 3,000 feet, growing higher than the tree, then falling down again, and eventually linking several trees together (thus bringing down several trees if one tree is cut). The fibers of the liana, called rattan, are used in construction and weaving.

Other Rain Forest Plant Life

Epiphytes: The word "epiphyte" comes from the Greek words meaning "upon plant." Epiphytes grow on other plants but do not harm their host. Instead, they take all the nutrients they need from rain water and decaying plants. Examples of epiphytes include mosses, lichens, ferns, orchids, and bromeliads. Orchids are plentiful in the tropical rain forest, with close to 20,000 species.

Parasites: Parasites are plants that live off other plants to survive, often killing their hosts in the process. Some fungi are parasites, as is the strangler fig. Strangler figs begin as epiphytes but as their roots reach the ground, they grow rapidly around their host tree, smothering and eventually killing the tree.

Soils of the Rain Forest

Despite the fact that the tropical rain forest is filled with abundant plant life, the soil is not very fertile. The nutrients are leached out of the soils by the heavy rains. Most of the rain forest's nutrients are stored in the plants themselves.

The roots of rain forest plants are usually concentrated near the surface of the soil, so they can absorb nutrients from rapidly decaying leaf litter on the soil surface.

Insects of the Rain Forest

It has been estimated that there may be as many as 30,000,000 insect species in the world's tropical rain forests, with only a fraction of these described scientifically and named. Many insects live on the forest floor, such as ants, termites, and centipedes. Some army ants travel in columns of approximately 20,000,000, eating scorpions, millipedes, katydids, cockroaches, and other creatures. Mosquitoes are numerous in the rain forest, and can be carriers of malaria or yellow fever.

Other rain forest insects rely on dramatic camouflage to hide from predators; the Malaysian giant walking stick resembles a green twig and may grow to 13 inches in length. Other insects may look like green leaves, or even flowers.

Reptiles and Amphibians of the Rain Forest

Many snakes and lizards inhabit the canopy, their coloration offering protection from predators. Most snakes are small and thin allowing easy treetop travel. Other large snakes, like the reticulated python which may reach a length of more than 30 feet, dwell on the forest floor. Many reptiles and amphibians in Southeast Asia who live in the canopy have adapted to travelling from tree to tree by "flying." Flying frogs have large webbed toes that act like parachutes. Flying lizards have flaps of skin on their sides, and the flying snake can flatten its body and glide. Many species of frogs and salamanders live on the forest floor.

Birds of the Rain Forest

Birds inhabit all levels of the rain forest. The large hornbills of Southeast Asia live in the canopy, feeding on abundant fruit. They swallow fruits whole, passing the seeds in their droppings throughout the forest. Asian sunbirds are similar to hummingbirds, using their long, thin beaks to sip nectar from flowers.

The understory is home to birds of paradise. The brilliantly colored males gather and dance to attract the plain-colored females.

In Asia, the forest floor is home to peacocks, pheasants and the jungle fowl, which is the ancestor of all modern domestic chickens.

Mammals of the Rain Forest

Mammals inhabit all levels of the rain forest. The canopy is home to the primates such as monkeys, gibbons, and orangutans. With their limbs well adapted for climbing, these animals can spend nearly all their time in the trees feeding and even sleeping there. The orangutan lives only on the Indonesian islands of Borneo and Sumatra, where it feeds on tender leaves. Many bats live in the rain forests. Most feed on fruit, and assist with both pollination and seed dispersal. Larger animals like the leopard, tiger, and elephants live on the forest floor.

Tropical Rain Forests: Did You Know...?

*** Tropical rain forests cover about 6 percent of the earth's land mass. Two hundred years ago, they covered 20 percent of the earth's land surface.

*** More than half (some say up to 90%) of all plant and animal species on earth are found in rain forests.

*** One fourth of all medicines in use today are derived from plants. Seventy percent of the plants containing compounds useful in cancer treatment are found only in rain forests. Yet fewer than one percent of tropical rain forest plants have been thoroughly studied for their chemical compounds.

*** Each year, an area the size of the state of New York - over 30,000 square miles -- of tropical rain forest is destroyed. At the present rate of destruction (about one acre per second), the remaining rain forest could be depleted in this century.

*** The country of Indonesia is home to one-sixth of the world's bird species, one-fourth of the world's fish species, 10 percent of the world's flowering plant species, and 12 percent of the world's mammal species, making it one of the planet's most important centers of biodiversity.

*** A typical 4 square mile area of rain forest contains:

1500 species of flowering plants

750 species of trees

125 species of mammals

400 species of birds

60 species of amphibians

150 species of butterflies

*** It is a common myth that rain forests are the "lungs of the world." While it is true that rain forests produce vast amounts of oxygen through photosynthesis, they consume as much as they produce in the decay of organic matter. Rain forests do play a critical role in our atmosphere, though, because they hold huge amounts of carbon in their vegetation. When the rain forest is burned, or the trees are cut and left to decay, the carbon is released into the atmosphere as carbon dioxide. This is the second largest factor contributing to the greenhouse effect.



Rain Forests: Problems and Solutions

Everyone knows that the rain forests are being cut down in countries all over the world. Growing populations are putting tremendous pressure on these great resources. Rain forests are often seen by the governments of these countries as solutions to their problems of overcrowding, poor economic growth, and food for the hungry. Slash-and-burn agriculture is sometimes the only alternative for a poor family. Until other methods of farming are found and put into practice, deforestation of the tropics is likely to continue.

What are the Problems?

Slash-and-Burn Agriculture. Up to 20 million acres of tropical rain forest are cleared each year for farming. In earlier times, when populations were smaller, small plots of cleared forest had time to regenerate. Today, population pressures are greater. Too much forest is cut to allow for regrowth. Soils erode, the land loses fertility.

Logging. Commercial logging operations cut hardwoods for export abroad. Most logging, though, is for firewood or charcoal, which are used as cooking fuel.

Cattle Ranching. Abandoned farms are often converted to cattle ranches. But because the soil is so poor, it cannot support enough vegetation for profitable cattle raising.

Illegal Wildlife Trade. The demand for exotic pets and products has created a thriving black market in illegal wildlife trade. Many rain forests are losing important species to this trade.

Hydroelectric Projects. The need for inexpensive electricity and the creation of jobs leads many countries to build hydroelectric dams. Huge amounts of rain forest are flooded, displacing native wildlife and peoples.

What are the Solutions?

Protecting Habitats. Identifying and protecting critical habitats by creating national parks and reserves can help save wildlife. Laws must be enforced and the support of local people must be gained.

Restoring Endangered Species to the Wild. Reintroducing endangered animals to protected areas of their native habitat can restore once-extinct populations.

Stopping Illegal Trade. Close monitoring of wildlife trade and enforcement of laws can help protect endangered animals.

Education and Training. Helping local citizens understand the importance of conservation activities creates support for wildlife conservation.

Research. Scientists do not know all there is to know about rain forests. Research must be ongoing to develop effective programs.

What Can You Do?

Become better informed about the issues surrounding rain forest conservation.

Write letters to your senators and representatives urging them to support legislation and programs that may benefit tropical rain forests.

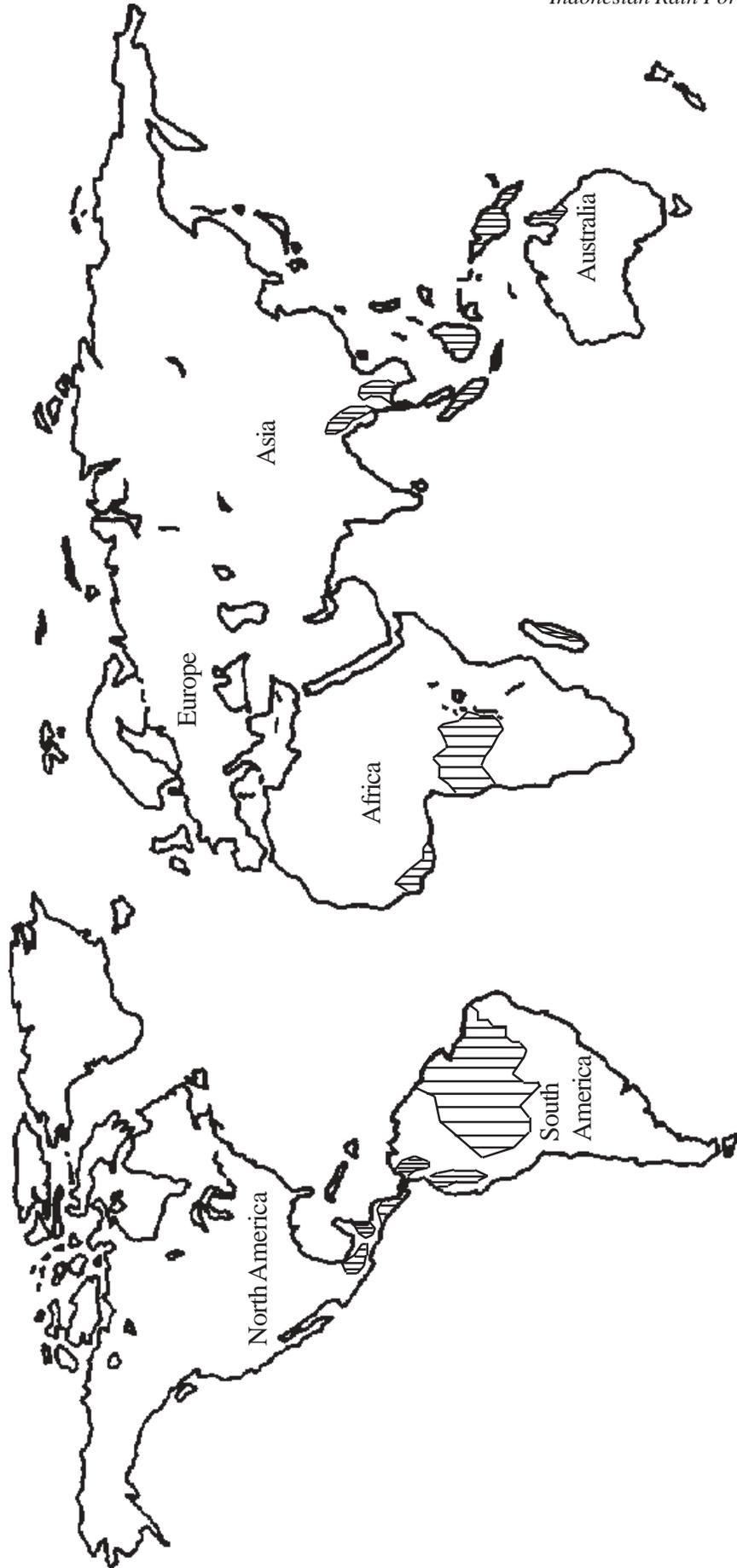
Don't buy animals or plants that are taken illegally from the wild.

Recycle.

Save a space for wildlife in your school yard or backyard.

Raise money to support conservation groups that are working to save rain forests.

Tropical Rain Forests of the World



Tropical Rain Forest Products

Products originating in or currently found growing in tropical rain forests are listed below.

Woods

(furniture, floors, doors, paneling, cabinets, carvings, toys, models)
balsa
mahogany
rosewood
sandalwood
teak

Canes and Fibers

bamboo (furniture, crafts)
jute (rope, twine, burlap)
kapok (insulation, stuffing)
ramie (knit materials)
rattan (furniture, wicker, cane chair seats)

Fruits and Vegetables

avocado
banana
grapefruit
guava
heart of palm
lemon
lime
mango
orange
papaya
passionfruit
pepper
pineapple
plantain
potato
sweet potato
tangerine
tomato
yam

Spices and Flavors

allspice
black pepper
cardamom
cayenne
chili pepper
chocolate or cocoa
cinnamon
cloves
ginger
mace
nutmeg
paprika
turmeric
vanilla

Other food products

Brazil nuts
cashew nuts
coconut
coffee
cola
corn
macadamia nuts
peanuts
rice
sesame seeds
sugar
tapioca
tea

Houseplants

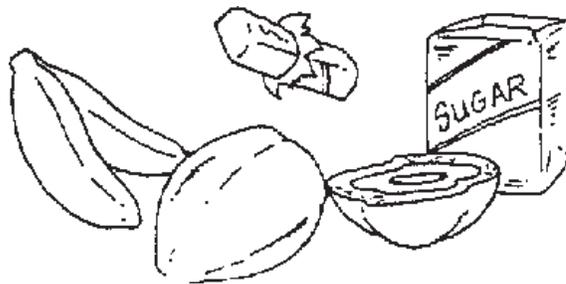
African violet
Begonia
bromeliads
Christmas cactus
Croton
Dracena
fiddle leaf fig
orchids
Philodendron
prayer plant
rubber plant
snake plant (*Sansevieria*)
umbrella tree (*Schefflera*)

Oils

bay (bay rum lotion)
camphor (insect repellent, lotion)
coconut (baked goods, lotion, soap)
Lime (food flavoring, candles, soap, bath oil)
Palm (snack food, baked goods)
Patchouli (perfume, soap)
rosewood (perfume)
sandalwood (soap, candles, perfume)

Gums and Resins

chicle (chewing gum)
copal (varnish, printing ink)
rubber (balloons, erasers, foam rubber, balls, rubber bands, gloves, hoses, shoes, tires)



Indonesia: Basic Facts

Indonesia is the world's largest archipelago, with 13,677 islands extending 3,000 miles east to west and 1,100 miles north to south along the equator. It lies between two continents, Asia and Australia, and two oceans, the Indian and Pacific.

Principle islands include Sumatra, Java, Bali, Kalimantan (southern part of Borneo) Sulawesi and Irian Jaya (western part of New Guinea).

Land area: 782,665 sq. miles

Sea area: 1,222,466 sq. miles

Capital: Jakarta (population est. 10 million)



Coat of Arms



Flag

Climate: Equatorial but cooler in the highlands. Average temperature 68 to 89 degrees Fahrenheit. Wet season (November-April) and dry season (May-October).

Population: 234,893,453 (July 2003). Annual growth rate 1.53% (2003 estimate).

Religions: Islam, Christianity, Hinduism, Buddhism

Language: Bahasa Indonesia (Indonesian language), English, Dutch, plus more than 300 ethnic dialects, the most widely spoken of which is Javanese.

Education: 6 years compulsory.

Government: Unitary Republic with Sovereignty in the People.

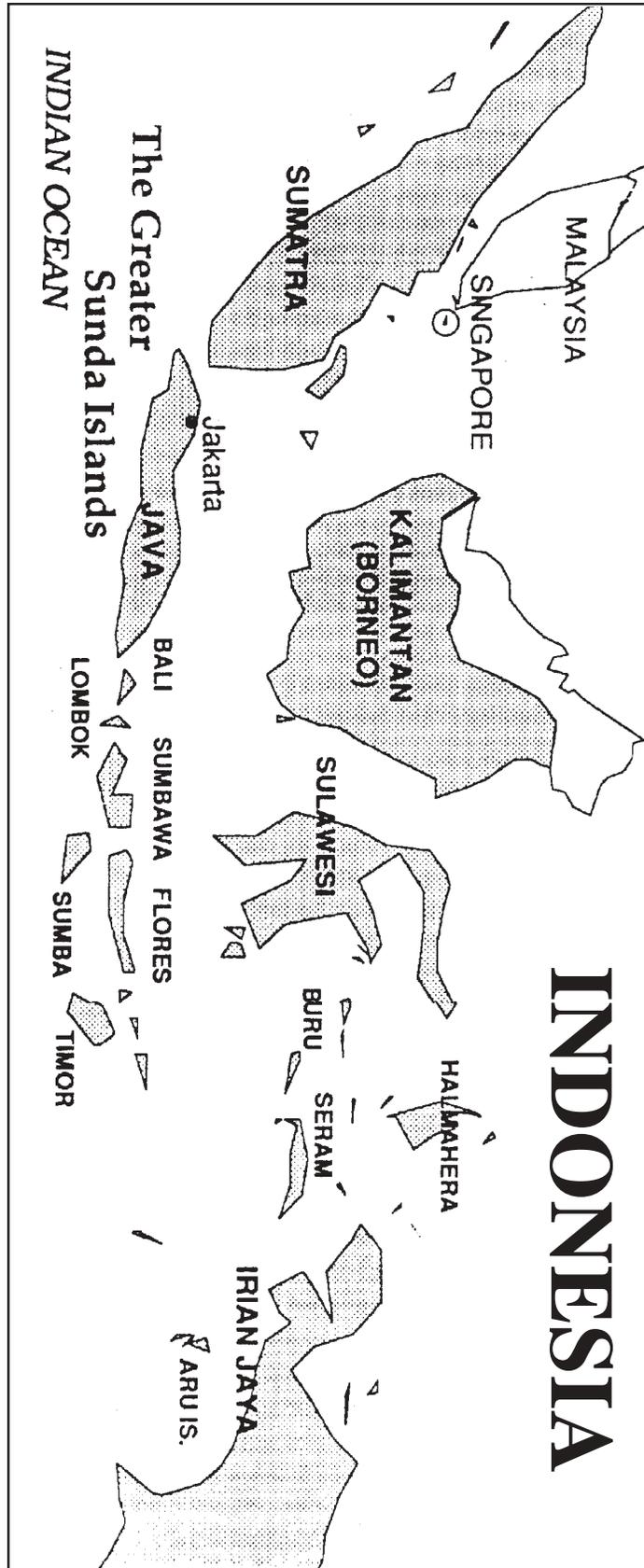
Flag: red and white divided horizontally: top - red, bottom - white.

Economy: Indonesia is
 the largest oil exporter in Southeast Asia,
 the world's largest liquefied natural gas exporter,
 the world's largest plywood exporter,
 the world's second largest producer of rubber,
 the world's second largest producer of palm oil.

Currency: Rupiah

For more information, write:
 Indonesian Tourism Promotion Office
 3457 Wilshire Boulevard
 Los Angeles, California 90010
 Phone: (213) 387-2078

Official Tourism Website:
www.budpar.go.id





A Tour of the Indonesian Rain Forest Exhibit

The Indonesian Rain Forest is designed to immerse visitors in the sights and sounds of the exotic country of Indonesia and its tropical jungles. By arousing curiosity, the Indonesian Rain Forest can help visitors appreciate the beauty of tropical rain forests and encourage actions that will protect these fragile, endangered ecosystems.

Indonesian Temple

The entry to the Indonesian Rain Forest lies between the existing pony rides and lemur exhibits. Here, the pathway is lined with engraved bricks recognizing hundreds of generous donors to the project (including more than 50 schools). Just ahead, designed in the architectural style of a traditional hut, is the Indonesian Temple. Exhibits in this open-ended building introduce visitors to the people, arts, and geography of Indonesia. Visitors are invited to tap on an authentic Indonesian gong, ring a set of Indonesian wooden bells, or discover Indonesia on an interactive map.

Upon leaving the Indonesian Temple, visitors can view the spectacled langurs in their outdoor habitat. White rings around the eyes of these monkeys look like eyeglasses, or spectacles. Adults are gray in color; infant spectacled langurs are orange.

Dr. Diversity's Rain Forest Research Station

Ahead, visitors will encounter enormous, rocklike temple ruins. Passing through the doorway, visitors enter Dr. Diversity's Rain Forest Research Station. Here, visitors will learn how Dr. Diversity, a fictional scientist, lives and works in the rain forest. One can walk between the legs of a life-sized replica of a Sumatran elephant skeleton, hear a weather forecast for the rain forest, or view the scales on a butterfly's wings. Don't miss Dr. Diversity's reptile collection, including the huge reticulated python, tentacled snakes, bright green Asian vine snakes and Timor monitor lizards. The diverse fauna of the rain forest is further illustrated with several insect exhibits, including the foot-long stick insect (walking stick) of Malaysia. Also look for the dramatically camouflaged leaf insects. The Komodo dragon can be seen in the research station. These lizards are among the world's largest, reaching a length of 8 to 10 feet. Kids can feel free to stretch out on the hammocks in Dr. Diversity's living quarters. And don't forget to pick up your Rain Forest Field Guide to identify the flora and fauna of the rain forest you are about to enter.

Rain Forest Dome and Orangutan Valley

The next stop on the tour is the highlight of any trip to the Indonesian Rain Forest: the Rain Forest

Dome. Visitors enter the domed jungle from a thatch-roofed porch situated atop a waterfall. The warm, steamy atmosphere, lush foliage and colorful animals of the rain forest create an exciting visitor experience.

Immediately past the porch, look for the flying fox fruit bats hanging out in a fig tree. The winding pathway carries visitors past towering bamboo, palms (including one 40-foot-tall specimen), banana plants and fig trees in search of tropical birds.

The wooden pathway takes visitors to the Orangutan Valley Observation Area. Through the six large windows, visitors may view the zoo's orangutans exploring their own man-made jungle. These spectacular red apes have large hands and feet (the big toe on the foot is opposable like a thumb) for grasping thick tree branches. Visitors may place a hand into a life-size plaster cast of an orangutan handprint. Press a button on the tape player and hear the orangs' long call and "kisses." The orangutans' spacious indoor habitat features "trees" made of concrete and steel and retractable skylights, which open to the outdoors to allow fresh air and even rain to enter the exhibit.

Back in the dome, pass under the waterfall into the cool, dark cave and see several species of tropical frogs and toads.

Conservation Plaza

Upon exiting the building, look for the screened-in Tree Tops Cafe and the one-of-a-kind Endangered Species Carousel. Commissioned exclusively for the Fort Wayne Children's Zoo, the carousel features hand-carved, solid wood figures depicting the endangered animals of Asia (Indonesia is a part of Asia). Cassowaries, leopards, tapirs, rhinos and other exotic creatures can be ridden. Signage helps educate visitors about the plight of these endangered creatures.

Tree Tops Trail and Tiger Forest

From the carousel plaza, visitors will step onto the Tree Tops Trail, an elevated boardwalk that winds along the wooded hillside. The first stop is Tiger Forest, where rare Sumatran tigers roam the wooded hillside. These cats represent one of the five surviving subspecies of tigers. On hot summer days, they may be seen cooling off in the stream in their exhibit. From the boardwalk, visitors can view rain forest creatures like the colorful Prevost's squirrel, the binturong (a relative of the civet and mongoose), colorful wrinkled hornbills, and the rare Bali mynah. Children are invited to crawl along a tunnel to the Kids' Tree House, where they can do a little exploring of their own.

Ahead, the white-cheeked gibbons swing through the treetops within their 30-foot-tall enclosure. These graceful apes are rarely seen in zoos. The spectacular siamangs, which are the largest of all gibbons, can be seen further along the boardwalk. They are best known for their loud "singing," which is enhanced in the male by an inflatable throat sac.

Interactive graphics along the boardwalk offer suggestions on how visitors can help preserve rain forests and the importance of rain forests in our daily lives. A Conservation Deck features a life-size statue of a Komodo dragon.

When visitors have completed their journey through the jungle, it is hoped that they will recognize the beauty and importance of tropical rain forests, and come away willing to employ some practical ideas for saving these tropical treasures.

Indonesian Rain Forest Species List

Outdoor Exhibits

Entry:

Spectacled langur

Tree Tops Trail Boardwalk:

Sumatran Tiger

Binturong

Wrinkled Hornbill

Siamang

White Cheeked Gibbon

Prevost's Squirrel

Bali Mynah

Dr. Diversity's Rain Forest Research Station

Insects:

Malaysian Walking Leaf

Malaysian Giant Walking Stick

Reptiles:

Flying Gecko

Tokay Gecko

Asian Vine Snake

Timor Monitor

Reticulated Python

Komodo Dragon

Tentacled Snake

Red-tailed Green Rat Snake

Orangutan Hallway

Orangutans

Rain Forest Dome

Birds:

Jambu Fruit Dove

Pied Imperial Pigeon

Black-naped Fruit Dove

Oriental White-eye

Blue Crowned Hanging Parrot

Red-headed Parrot Finch

Button Quail

White-headed Munia

Javan Munia

Bleeding Heart Dove

Fairy Bluebirds

Nicobar Pigeon

Javan Whistling Ducks

Mammals:

Flying Fox Fruit Bat

Plants:

Queen Palm, Butterfly Palm,

Cycad, Banana Plant,

Bamboo, Fan Palm,

Fig (many species), Hibiscus,

Orchids

Amphibians:

Malayan Horned Frog

Oriental Firebelly Toad

White-lipped Tree Frog

Please note:

The list of animals exhibited is
subject to change without
notice.

What is Diversity?

In this activity, students will learn about the concept of diversity as it applies to ecosystems.

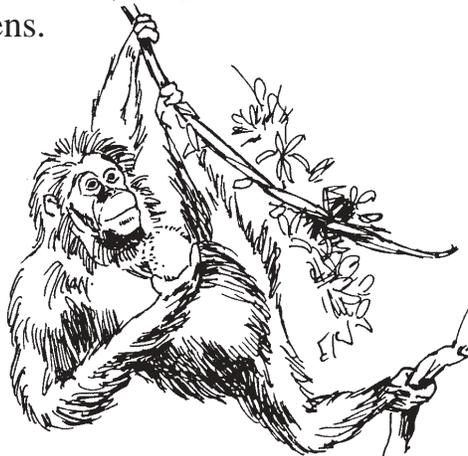
Students will compare the diversity of a typical temperate forest with that of a tropical rain forest.

Background:

Rain forests are home to a huge variety of plants and animals. It is estimated that these ecosystems, which cover only 6 percent of the earth's land area, are home to 50 to 90 percent of all species on earth. This concentration of species results in an incredibly diverse array of life in the rain forests.

In a single acre of tropical rain forest, more than 200 species of trees may be present. Only a few specimens of each species are scattered throughout this acre. Because each tree may have a specific pollinator (insect, mammal, or bird), this creates an even more diverse environment. This diversity can protect the forest in the event of a natural disaster, such as disease; if one or two tree species are susceptible, only a few trees per acre may be lost. But this very diversity has a down side, too; a single species of tree may be the sole support of several insect species. When the tree is gone, there are none of that species nearby to assume its role, and the fauna associated with it have nowhere to turn because of their specific adaptations for that single tree species.

Temperate forests, like those found in Indiana and much of the northeastern quarter of the United states, are less diverse than tropical rain forests. Less than ten species of trees are typically found within a single acre. Each tree species is represented by a large number of specimens.



Orangutan

Materials needed:

- Bag(s) of 15-bean soup mix (dried beans)
- Bag(s) of 3-bean or 5-bean soup mix (dried beans)
or any combination of dried beans you can find
(Note: small beans or peas will give you better results)
- Empty film canisters or baby food jars

Provide each student or team of students with two film canisters. One canister should be filled with the 3- or 5-bean soup mix. Label these as canister A. The other should be filled with the 15-bean mixture. Label these as canister B.

Procedure:

Ask the students to choose one of their canisters. Tell them that each type of bean in the canister represents one tree species. Dump out the beans and sort them by type. Count the number of different types of beans. How many of each type of bean are present in the canister? Have the students record their results.

Do the same with the other canister. Compare the results. Which canister would represent the rain forest? Which would represent a temperate forest? Which is more diverse?

Discussion:

What would happen if half of each tree species in the rain forest were destroyed? Would some of the students' "forests" have only one specimen of a particular tree left? How would this affect the animals that depend on that tree?

Which ecosystem is more stable (less likely to be affected by change?) Why? Which would have more difficulty returning to its original state once disturbed?

How does this exercise help explain the fragile nature of some rain forest ecosystems?

Extension:

Have the students glue each set of beans onto a small square drawn on paper. These square represent an aerial view of the rain forest and the temperate forest. In what ways do these "forests" appear different when viewed from the "air"?

Create a rain forest in your classroom

Decorate your classroom to look like a rain forest. Cut out tree trunks and large leaves and paste them to the wall. Hang "vines" of twisted brown paper from the ceiling. Create "epiphytes" from construction paper.

Students should research the plants and animals they will be creating. Decide if you want to build an African, Central /South American (Neotropical), or Asian rain forest. Each of these regions has its own unique plants and animals.

For added effect, play a tape of rain forest sounds. (Tapes are available through several nature catalogs and stores).

Rain Forest Products: Survey and Bulletin Board

Give each student a copy of the list entitled Rain Forest Products (page 10). Ask students to look for empty jars from home that contained these products or to clip pictures of the products from magazines.

Assemble the pictures on a bulletin board or make a display of the items collected.

Students could also use the sheet as a survey to check off how many of the items are found in their home. The results of the survey could be tallied and posted in the classroom.

Discuss the importance of the rain forest products. How would our lives be different if the rain forests had been destroyed before these products had been discovered? What could we be losing now that rain forests are disappearing at the rate of 60 acres per minute?



Prepare a Tropical Rain Forest Menu

Tropical Trail Mix

- 1 cup cashew pieces
- 1 cup peanuts
- 1 cup banana chips
- 1 cup chocolate chips
- 1 cup dried pineapple chunks
- 1/2 cup coconut flakes

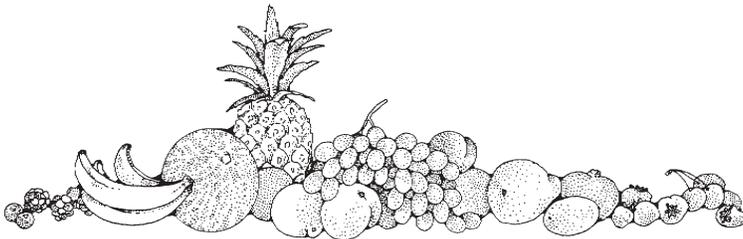
Combine the ingredients in a large mixing bowl. Makes about 2 pounds. You may want to add some other tropical items as you find them, such as sesame seeds, Brazil nuts, dried papaya, and macadamia nuts.



Tropical Punch

- 1 banana
- 1 cup orange juice
- 1 cup pineapple juice
- 1 can lemon-lime soda
- 1 pint lemon sherbet

Puree a soft banana in a blender. Add orange and pineapple juices and blend. Just before serving, add the lemon-lime soda and mix well. Put a spoonful of lemon sherbet in each glass and fill with punch. Makes about 1 quart.



Tropical Popcorn Crunch

- Mix together:
- 2 ounces flaked coconut
 - 4 ounces dried pineapple, diced
 - 2 ounces dried dates, diced
 - 2 quarts popped popcorn

Consider holding a rain forest bake sale. Proceeds could be donated to an adopt-an-acre project or to an organization that helps preserve rain forests.



Create a Mini Rain Forest

Materials needed:

A large fish tank; gravel; charcoal; compost; small stones; exotic plants (ferns, small orchids, moss, bromeliads, etc.); water.

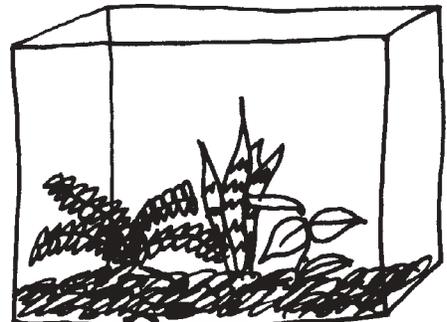
Directions:

1. Layer gravel and then charcoal (both available at an aquarium shop) on the bottom of the tank.
2. Spread small stones over the gravel/charcoal layer; create small hills and valleys.
3. Cover the stones with about an inch of compost.
4. Dampen the compost with water and plant the ferns, orchids, moss and bromeliads. Allow plenty of growing space between the plants.
5. Cover the aquarium with a glass top. Keep in a warm place out of direct sunlight.
6. You may need to add a little water every few months.

Ideas:

Have students maintain a rain forest observation journal. Ask them to record the date and time and write down any changes that occurred. Measure plant growth; draw pictures or sketches.

Investigate and ask students to offer a hypothesis:
Why does the rain forest require so little water?
What processes are taking place inside the aquarium?



Insect Window Stickers

Have your students imagine they are in the rain forest and have just discovered a new insect. What does the insect look like? What is its name?

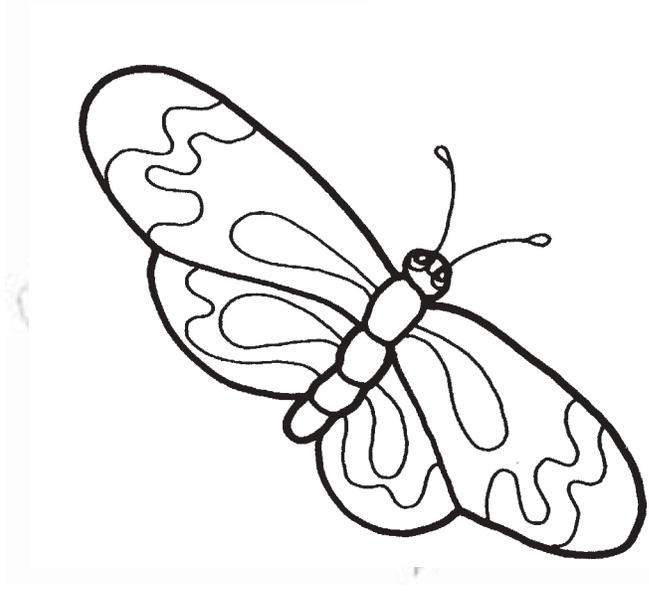
Materials:

Glue and tempera powder paint (or use colored Elmer's glue)

Wax paper

Squeeze bottles

Container and spoon for mixing



Procedures:

1. Mix the tempera paint with the glue in a small container and pour into the squeeze bottles. (Omit this step if you are using colored Elmer's glue).
2. Give each child a piece of wax paper and glue bottles. Tell them to use the glue to draw an insect on their paper.
3. Let the glue insects dry. Carefully peel the insect off the wax paper.
4. Tape the insects to a window in your classroom.

Mother Forest

Half of all the wildlife
That is found upon the Earth,
Can be seen among her branches...
Thank her cradle for their birth.

There is layer after layer
Of life within her trees.
So, treat her very gently
And shelter that life, please.

Be friends to Mother Forest.
It is sure that if you do,
All residents of Earth will owe
A debt of thanks to you.

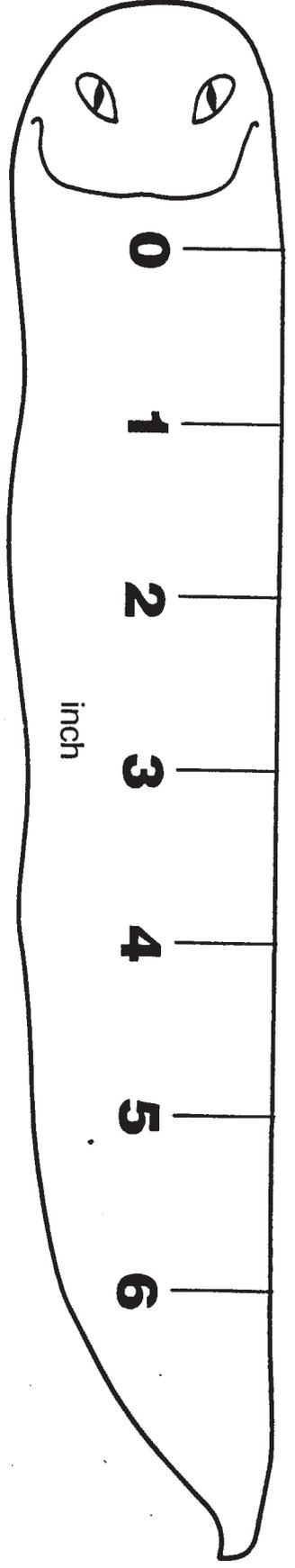
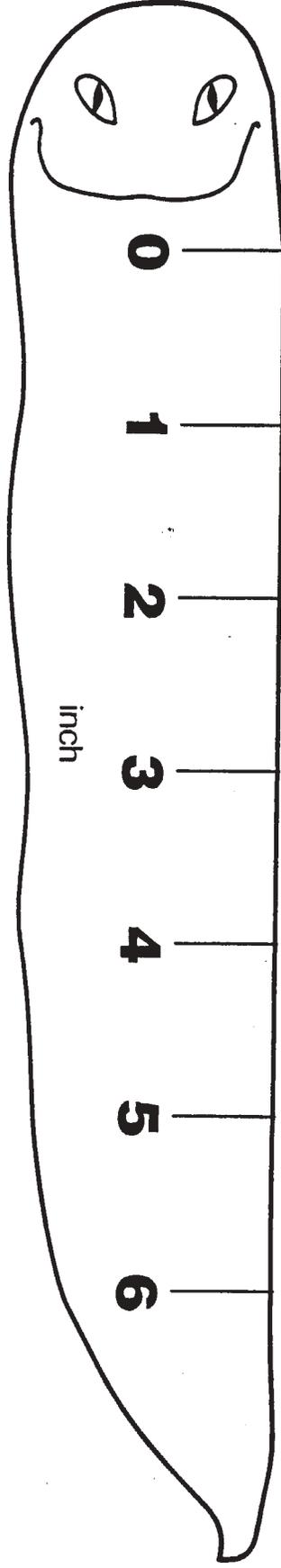
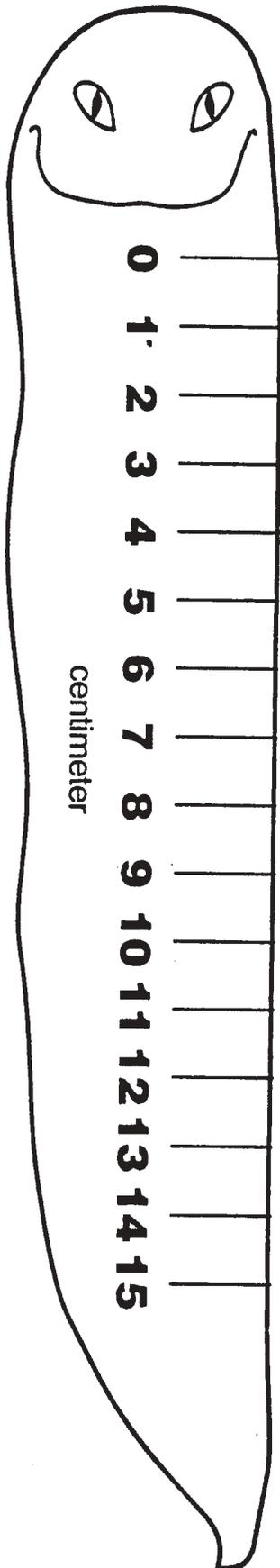
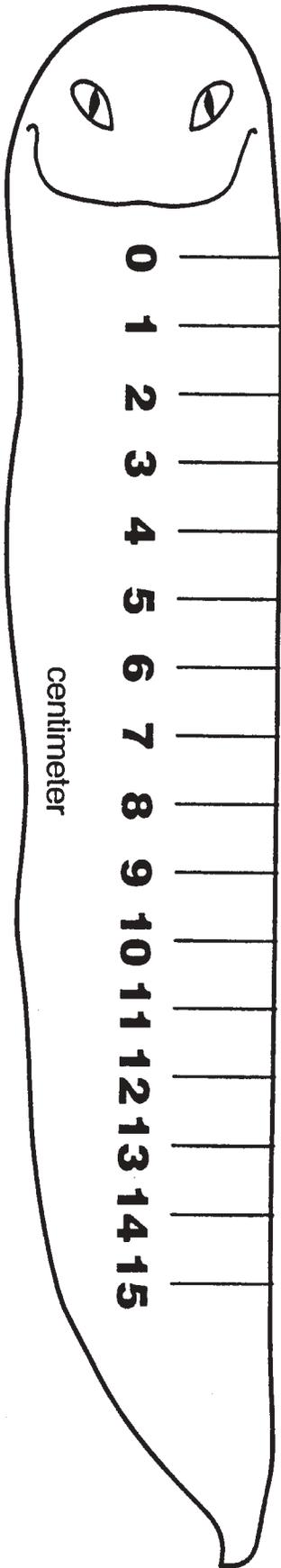
by Melinda Eckert



Python Rulers

1. Have each student draw and color a python on a piece of paper. The snakes can be any length or color. Cut out the pythons and use them to measure objects in the classroom. For example, find out "How many pythons long is this desk?"
2. Have each child in the class measure one object in the room. Record their answers (the number of pythons) on the board. Why does each child get a different answer?
3. Copy and use these python rulers when your students are ready to study standard measurement.





Tropical Rain Forest Animal Research

Students will conduct research to learn how a rain forest animal has adapted to survive in its habitat.

Instruct students to choose an animal that lives in the tropical rain forest. They may wish to choose one that is found at the Fort Wayne Children's Zoo's Indonesian Rain Forest exhibit (see the list on page 15). Tell the students to design a cover for a folder in which they will keep their research. Ask students to fill out the Tropical Rain Forest Animal Research sheet (see next page) with information about their animal.

Ideas to include in folders: a story, poem, cartoon, play or newscast item about their animal; design a bumper sticker, t-shirt or button that conveys information about the animal. These designs could be on paper or in the actual medium.



Tropical Rain Forest Animal Research

Student Activity Sheet

Give the following information for your animal:

1. Common name of animal:

2. Scientific Classification:

Kingdom:

Phylum:

Class:

Order:

Family:

Genus:

Species:



3. On the map, indicate the geographic range of your animal. If you know, use different colors to indicate present and former range.

4. List what your animal eats in the wild:

5. How does your animal get food? (e.g. grazing, wait and ambush, stalking, running, etc.)

6. Describe the ways in which your animal has adapted to live in its rain forest habitat. These could include body structures such as skin covering, ears, nose, feet, teeth, etc.

7. What do you think is the future of your animal in the wild? Why?

8. What in your opinion is the best plan to assure your animal's future in the wild? Detail the steps in your plan.

Design a Plant

In this activity, students will design a plant that has adapted to survive in the tropical rain forest. Students will become familiar with at least four ways that tropical plants survive conditions of high temperature, high humidity, plant eaters, and decomposers.

Materials: Design a Plant Student Activity Sheet (see next page), teacher background information, and the facts listed below.

Extensions: Students may be asked to create their plant in three dimensions using crepe paper, paper mache, clay, fabric, or other material.

Teacher Background Information

These plant survival strategies have been noted by researchers in tropical rain forests. Some of these may be seen at the Fort Wayne Children's Zoo's Indonesian Rain Forest exhibit.

Buttress Trunks: Flange-like root growth on the trunk or base of tall trees that help stabilize and support the shallow root system.

Prop Roots: Long, above-ground roots which radiate from the trunks of smaller trees and act as stabilizers.

Drip Tips: Tips of leaves that come to a long and very pronounced tip and are thought to help shed moisture that would encourage fungal and bacterial growth on the leaf surface.

Poison Leaves or Bark: The taste or smell of chemicals deters insects or other animals that might eat the leaves or bark.

Smooth Bark: A feature that deters climbing plants from gaining a hold.

Hard Bark: Deters boring and chewing insects.

Thorny Bark: Deters climbing animals.

Design A Plant

Student Activity Sheet

Instructions to students: How do plants survive in a warm, humid environment that encourages plant growth, yet also favors the growth of other creatures that eat and use the plants?

1. Read "Conditions in a Tropical Rain Forest" below and think about how a plant could survive under these conditions.
2. Design a plant of your own that you believe would survive in the tropical rain forest. Draw and color the plant on a separate piece of paper.
3. Explain how your plant avoids the problems listed in Conditions in a Tropical Rain Forest and answer the questions at the bottom of the page.

Conditions in a Tropical Rain Forest

A. Green plants use sunlight to make their own food in a process called photosynthesis. Note: In photosynthesis, the leaves of the plant remove carbon dioxide from the air while root systems draw up water. When six atoms of carbon are formed in a chain, a molecule of glucose is formed. Glucose, a sugar, is food or energy that the plant needs in order to grow. Excess oxygen is returned to the atmosphere in the chemical process.

B. A lot of rain falls in the tropical rain forest (between 60-400 inches per year). Moisture combined with high temperatures creates high humidity, a condition that favors the growth of fungi and mold, as well as fast plant growth.

C. The nutrient layer of tropical forest soils is shallow. Most of the forest's nutrients are quickly decomposed or used up by the living plants and animals.

D. Plant roots are usually very shallow.

E. Trees and lianas that reach the canopy are often 65 feet or more in height. Emergents, the trees which rise above the canopy, are subject to strong winds, searing heat, and buffeting rains.

F. On the forest floor, light is very low, humidity is very high and temperature is more constant.

G. Millions of insects and other animals use the plants as shelter or eat the plant leaves and bark.

As you design your plant, answer the following questions.

1. In what level of the forest does your plant grow?
2. Does your plant need a lot or a little sunlight to survive? How does it get this sunlight?
3. How does your plant obtain water?
4. Does your plant use any strategy to collect or shed water?
5. How does your plant obtain the nutrients needed to grow?
6. Does your plant carry on photosynthesis?
7. How does your plant protect itself from insects and other animals?
8. Does your plant need to have a strategy to keep from blowing over in high wind?

Journey to the Jungle

On your visit to the Indonesian Rain Forest, look for:

1. A colorful insect: _____

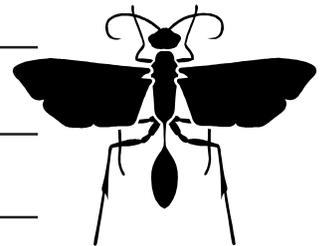
2. The world's longest snake: _____

3. A plant that produces food eaten by people: _____

4. An animal that is camouflaged: _____

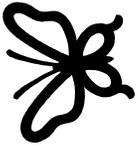
5. A mammal that flies: _____

6. An endangered animal from Asia: _____



7. Name one way you can help rain forests:

Write the answer on the line, or draw a picture of the answer.



Layers of Life Animal Chart



Use this chart to record the animals you see in the Indonesian Rain Forest dome. Fill in as many of the boxes as you can.

| Animal | Layer Floor, Understory, Canopy, Emergent | Classification Mammal, Bird, Reptile, Amphibian, Fish, Insect | Describe how it looks | Food | Enemies | Notes |
|--------|---|---|--------------------------|------|---------|-------|
| | | | | | | |
| | | | | | | |
| | | | | | | |
| | | | | | | |

"Rainbow" Forest

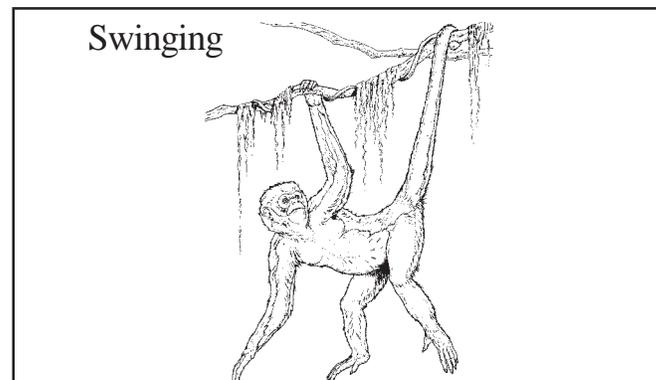
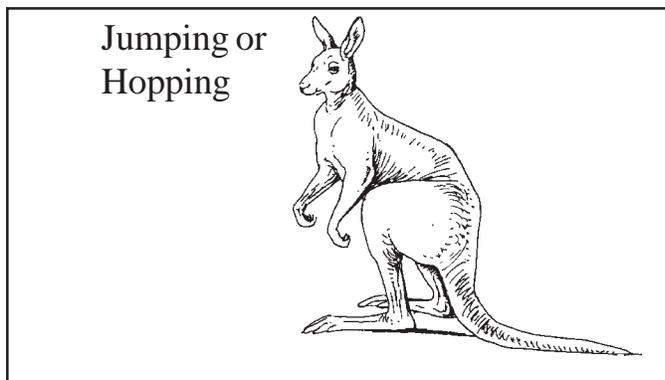
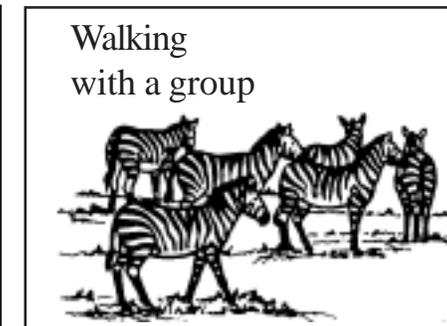
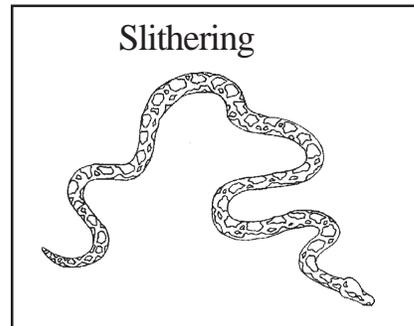
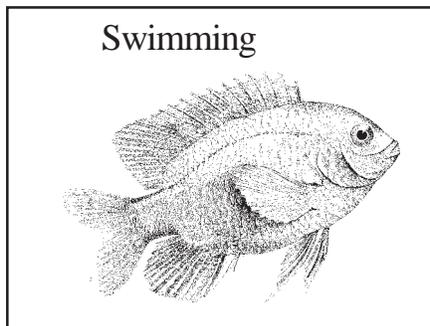
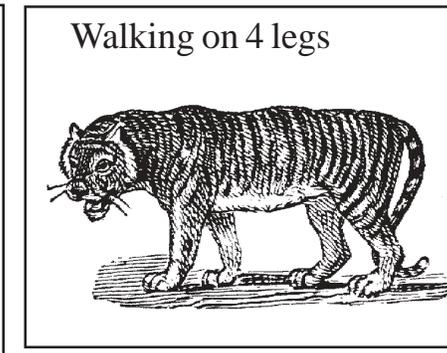
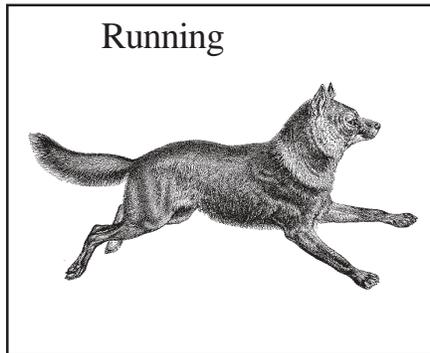
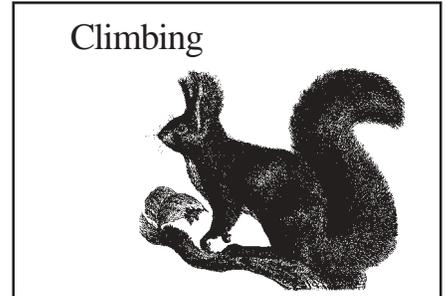
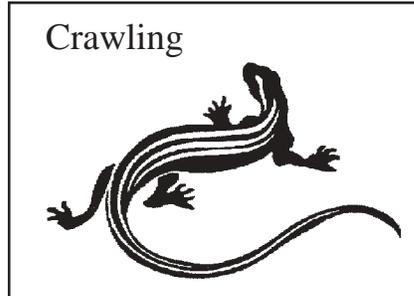
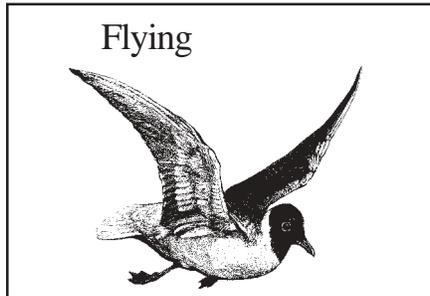
The Rain Forest is a very colorful place. As you walk through the rain forest, check each time you see the following colors.

Example: Each time you see something red, place a check beside the word "red."
Which color do you see the most of in the rain forest?

| | |
|--------|--|
| Red | |
| Yellow | |
| Blue | |
| Green | |
| Orange | |
| Brown | |
| Pink | |
| Black | |
| White | |

How Animals Move

As you walk through the Indonesian Rain Forest, put an X through the picture when you see an animal moving that way.



Birds of the Indonesian Rain Forest



Instructions: Discover how birds have adapted to their environment by observing 4 different bird species in the Fort Wayne Children's Zoo's Indonesian Rain Forest exhibit. Read the interpretive signs, observe the birds, and complete this activity sheet.

| Species Name | Layer of Rain Forest | Coloration | Beak/Diet |
|--------------|----------------------|------------|-----------|
| | | | |
| | | | |
| | | | |
| | | | |

Primates of the Tropical Rain Forest

Student Activity Sheet



Spectacled Langur



Siamang

The spectacled langur and the siamang are both primates that live in the rain forests of Indonesia. The spectacled langur is a monkey. The siamang is an ape.

Using this activity sheet as a guide, observe the spectacled langur and the siamang in their exhibits at the zoo. Compare the differences by answering the questions below.

Monkeys

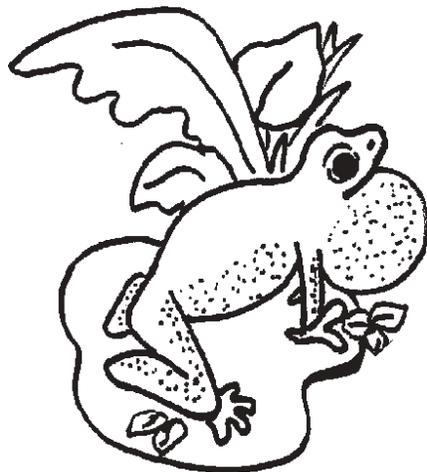
Apes

| | | |
|-------|-----------------------|-------|
| <hr/> | Does it have a tail? | <hr/> |
| <hr/> | How does it move? | <hr/> |
| <hr/> | Compare chests | <hr/> |
| <hr/> | Compare legs and arms | <hr/> |

Rain Forest Stationery

Use the designs below to make rain forest stationery. Cut and paste one design to the upper or lower corner of a sheet of paper. Make enough copies for each student. Ask the students to write a letter to:

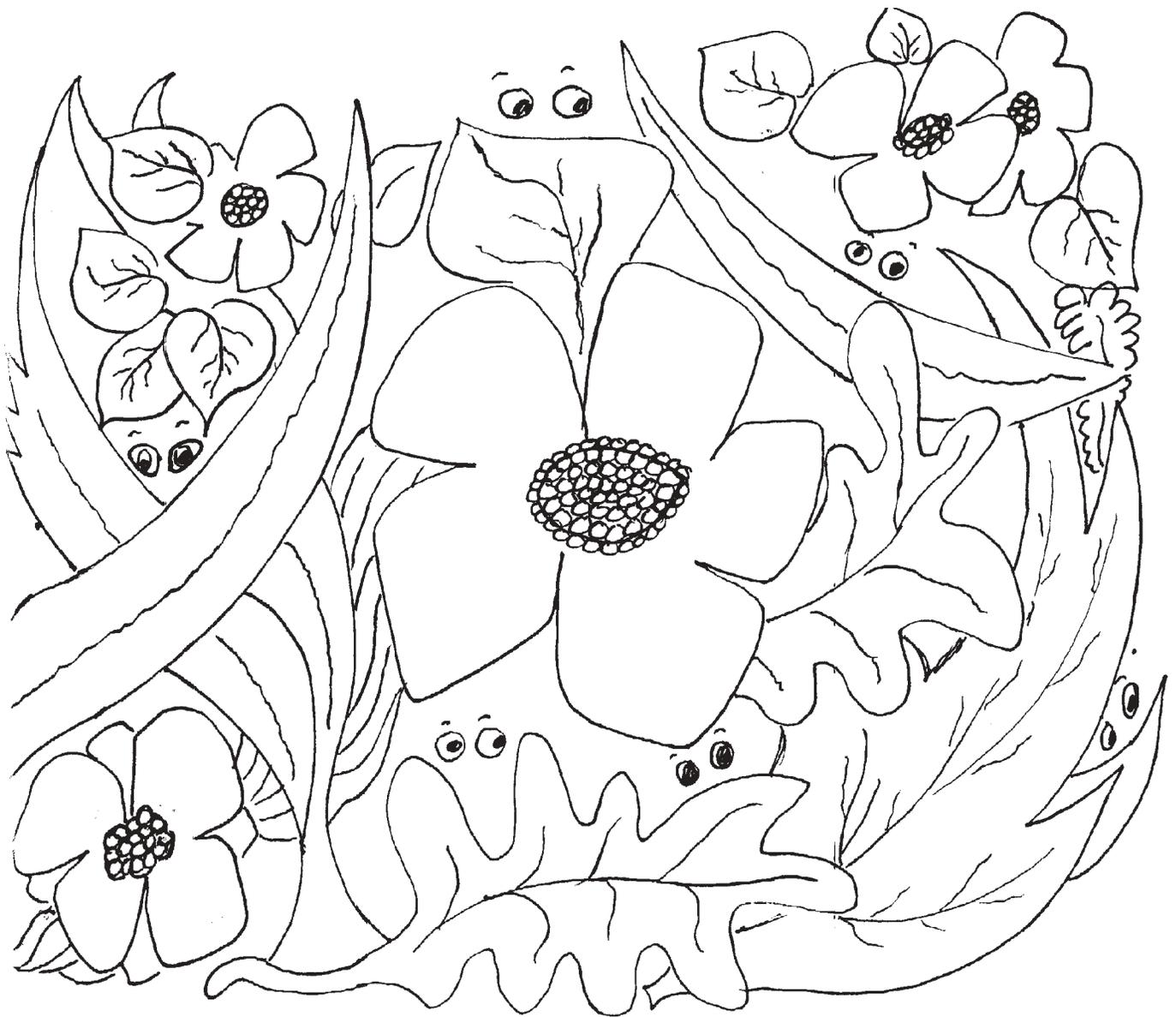
- *their families, telling them about their zoo trip;
- *the zoo, listing their favorite parts of their zoo trip;
- *a school buddy in another grade, asking them questions about a favorite animal.



Rainbow Forest

Rain forests are a world of color. Think about the trees and the leaves. Think about the flowers. Think about the butterflies, insects, and all the other animals. Picture all the beautiful colors you saw on your visit to the Indonesian Rain Forest.

Using all these colors, color in the design below.

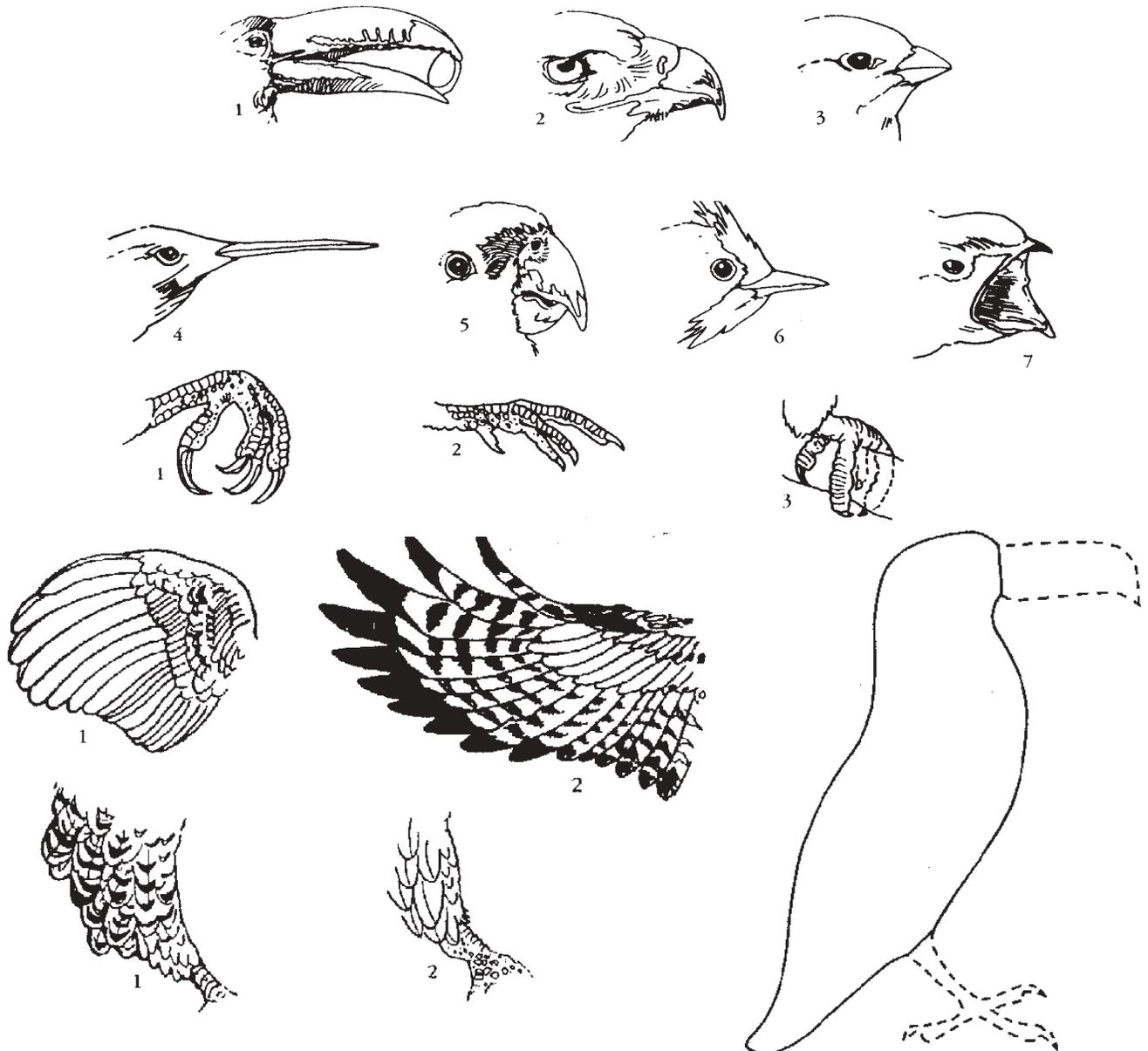


Create a Bird

Using the heads, beaks, wings, and feet below, create your own bird. Cut out the parts you choose and attach them to the bird body.

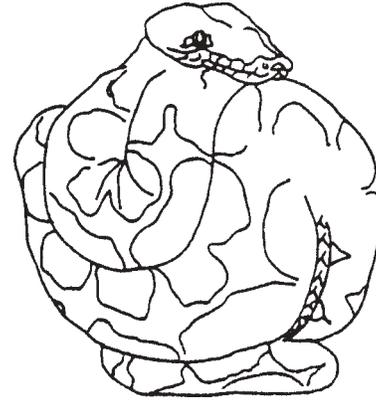
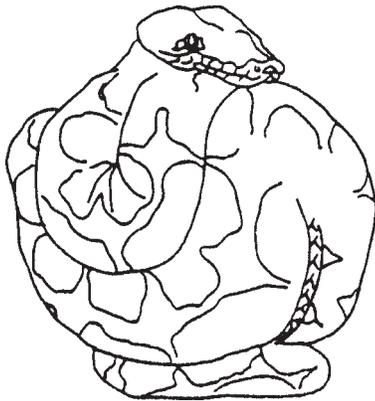
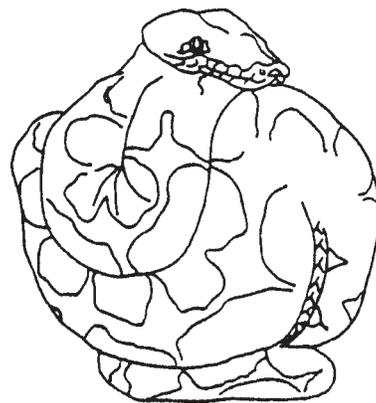
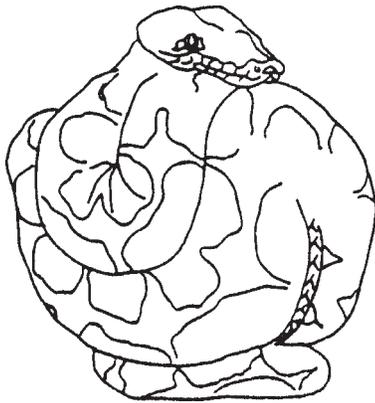
After you make your bird, answer these questions on a separate sheet,

1. What does your bird eat?
2. Where does your bird live? How does your bird protect itself from predators?
3. What sound might your bird make?
4. Write a short story telling about a day in the life of your bird.



Snake Habitat

Color each snake below, using different colors and patterns for each snake. Cut out and try to hide each snake, one at a time, in the tropical rain forest scene you have colored.



Tropical Rain Forest Scene

Color the foliage the way you think it would appear in a tropical rain forest. Use this scene to hide the snakes you have colored.



Whose Side Are You On?

In this activity, students will discuss the pros and cons of saving the world's endangered rain forests.

Option 1: Divide your students into six teams. Assign each team one of the opinions stated below. Each team must come up with arguments to support the opinion that has been assigned to them. The students could then debate the issues they have researched. Team A1 and A2 should debate each other, Team B1 and B2 debate each other, and so on.

Option 2: Assign one of the opinions to each student and have them write an essay supporting that opinion.

A1: "So many small farmers cut down trees that the rain forest has no chance to grow back." *Scientist*

A2: "To feed my family, I must cut down the rain forest to grow rice and other crops." *Farmer in developing nation*

B1: "Rain forests are so far away. I don't need to care about them." *American*

B2: "Rain forest plants may hold a cure for cancer or AIDS. The forest must be saved so we can learn its secrets." *Doctor*

C1: "Rain forests should be preserved for future generations. Man has no right to destroy them completely." *Ecologist*

C2: "Laws protecting the rain forest are expensive to enforce. Our people need food, not trees." *Government official of developing country*

Teacher Answer Keys

Journey to the Jungle

On your visit to the Indonesian Rain Forest, look for:

1. A colorful insect: Butterflies, beetles, moths (mounted specimens in drawers and microscopes)
2. The world's longest snake: Reticulated python
3. A plant that produces food eaten by people: Bamboo, banana, palms
4. An animal that is camouflaged: Malaysian walking leaf, Malaysian giant walking stick, also a variety of snakes, toads, lizards
5. A mammal that flies: Flying fox fruit bats
6. An endangered animal from Asia: Any of the figures on the endangered species carousel (Sumatran tiger, Asian elephant, Malayan tapir, dugong, orangutan, and others)
7. Name one way you can help rain forests: Recycle, conserve energy, avoid buying products that deplete rain forests, learn about rain forests, contribute time or money to organizations that protect rain forests.

Primates of the Tropical Rain Forest

Monkeys

Has a tail

Walks on flat palms

Narrow chest

Legs and arms about same length

Does it have a tail?

How does it move?

Compare chests

Compare legs and arms

Apes

Has no tail

Brachiates (swings through trees using arms)

Broader chest

Arms longer than legs

Animal Facts: Binturong

Class: Mammalia

Order: Carnivora

Family: Viverridae

Scientific Name: *Arcitis binturong*

Range: Sumatra, Java, Borneo, and Palawan Island; Burma, Malayan and Indochinese peninsulas

Habitat: High trees in dense forests

Natural Diet: Fruits, leaves, insects, birds, small mammals, and fish

Zoo Diet: Meat, monkey chow, grapes, apples, oranges, bananas

Physical Characteristics: Resembles a small bear; coarse, black hair arranged in tufts behind the ears; prehensile (grasping) tail used to climb trees. Weight about 45 pounds. Life span about 18 years. Plantigrade (walks on soles of feet).

Behavior: Solitary, nocturnal; displays playful behavior similar to that of a raccoon. Good climber, does not leap or jump.

Reproduction: Breeding season occurs in March and October; one or two young are born after a gestation period of 84-99 days.



Animal Facts: Siamang

Class: Mammalia

Scientific Name: *Hylobates syndactylus*

Range: Mountainous regions of Sumatra and mainland Malaysia

Habitat: Tree dwelling in evergreen tropical forests; usually found at 25-30 meters in the trees

Natural Diet: Leaves, fruits, sometimes insects, bird eggs, small vertebrates

Zoo Diet: Apples, oranges, carrots, bananas, sweet potatoes, sunflower seeds, spinach, grapes, pears, melon, tomatoes, broccoli

Physical Characteristics: Largest of the gibbons; arm spread up to 1.5 meters. As a member of the ape family, siamangs lack a tail. Weight approximately 30 lbs. Fur is black; throat sac expands when singing. Thumb of hand and great toe of foot are well-adapted for grasping. Webbing unites the second and third toes. Life span about 25 years.

Behavior: Diurnal. Feed in trees about 10.5 hours daily. Family group will hoot in unison in early morning to establish its claim to a feeding area, and again at night to mark home territory. Call alternates between hoots and barks, which are made louder by resonance across greatly inflated throat sac.

All gibbons move by brachiation, a hand over hand movement through the treetops. When moving on the ground will walk upright with arms held high for balance.

Live in groups consisting of a mated pair and their



offspring. Groups stay close together throughout the day. Social bonds reinforced by mutual grooming.

Reproduction: Monogamous. Gestation is 230-235 days. Single young clings to its mother's body like a belt. Early in second year, father takes over most care.

Conservation: Wild gibbons have suffered severe losses through destruction of habitat. Gibbons are still fairly widespread throughout their range but are classified as endangered.

Note: *Hylobates* means "dweller in the trees."

Animal Facts: Wrinkled Hornbill

Class: Aves

Scientific Name: *Rhyticeros corrugatus*

Range: Sumatra, Borneo, Malay peninsula, and Batu Islands

Habitat: Lowland and swamp forests

Natural Diet: Figs, frogs, lizards, young birds, snails, and arthropods

Zoo Diet: Apples, bananas, fruit cocktail, shredded carrots, tomatoes, cooked rice, moist dog food, hard-boiled egg yolk, commercial bird diet

Physical Characteristics: Medium-sized (75 cm); male is black with sides of head, neck, and tail white, with a large casque (pronounced "cask") on top of the beak; female has black head and bluish skin on throat; short, red, buckled casque; very long tail.

Behavior: Lives singly or in groups; shy; flies high over forest to evening roost trees.

Reproduction: Female lays 2-5 white eggs; 2-3 days before laying eggs, female enters a nest hole in a tree cavity and plasters up the entrance; male feeds the young and female through a slit; female remains walled up until the young are ready to fledge (learn to fly).



Animal Facts: Reticulated Python

Family: Boidae (boas and pythons)

Scientific Name: *Python reticulatus*

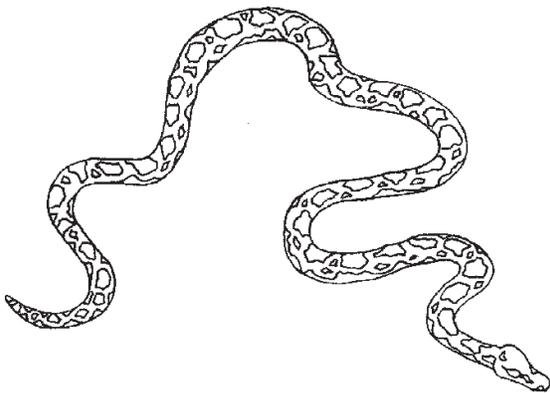
Range: Southeast Asia, Philippines, Indonesia

Habitat: Tropical forests

Natural Diet: Hares, rats, wild pigs, sometimes antelope; a large meal will last the snake for several weeks.

Zoo Diet: Chickens, rabbits

Physical Characteristics: Heavy build with broad, flat head. Reaches lengths up to 33 feet, average length is about 20 feet; can weigh up to 440 pounds. Known as world's longest snake, while the anaconda of South America is the world's heaviest.



Color varies from tan to purplish brown with a network of dark, diamond-shaped markings.

Heat-sensitive pits located on lower and upper lips assist in detecting warm-blooded prey in total darkness.

Behavior: Largely arboreal in habit but frequently descends to the ground to feed on rodents or domestic animals in the vicinity of villages. Quick and skillful travelers. Often lie in wait for prey, then spring out with front of body. Grip prey with teeth, then constrict prey with body coils to suffocate prey.

Reproduction: Egg-laying; may produce 15 -100 leathery-shelled eggs. Female pythons are among the few snakes which incubate their eggs by coiling their body around the eggs. By twitching the muscles in her body, the female may be able to raise the temperature in the immediate vicinity of the eggs by as much as 12 degrees above air temperature.

Conservation: Many large snake species are endangered due to habitat destruction and illegal hunting for their skins, which are made into purses, shoes, and belts.

Animal Facts: Malaysian Giant Walking Stick

Class: Insecta

Scientific Name: *Pharnacia
acanthopus*

Range: Southeast Asia, Australia, and
New Guinea

Habitat: Warmer regions of the tropics;
found in trees and shrubs

Natural Diet: Plants

Zoo Diet: Plants

Physical Characteristics: Green or
brown in color; small head, antennae and
eyes; legs and body long and slender;
resembles twig or branch. Reaches
lengths up to 13 inches.

Behavior: Feed and move about at night;
motionless during the day; can mimic
color of the plant it is resting on; capable
of regenerating lost limbs; can emit
chemicals from a special gland located on
the thorax as a defense mechanism.

Reproduction: Female lays large, hard-
shelled eggs; several hundred eggs can be
laid which take several months to hatch.
This species is parthenogenic, meaning
that the female can lay fertile eggs without
mating.



Animal Facts: Orangutan

Class: Mammalia

Scientific Name: *Pongo pygmaeus*

Range: Islands of Borneo and Sumatra
(located in Indonesia and Malaysia)

Habitat: Tropical rain forests

Natural Diet: Fruits, seeds, leaves

Zoo Diet: Fruits, vegetables, sunflower seeds, oatmeal, primate biscuits

Physical Characteristics: A large, heavy-bodied great ape covered with long, shaggy, reddish-brown fur. Male orangutans may reach 4 1/2 feet in height and weigh up to 200 pounds. The orangutan is built for moving through the treetops: its arms are long and powerful; fingers and toes are extremely long (the hand of an adult male can be more than 17" long); both the thumb of the hand and the big toe of the foot are opposable like a human thumb so the orangutan can grasp objects and make small or fine movements.

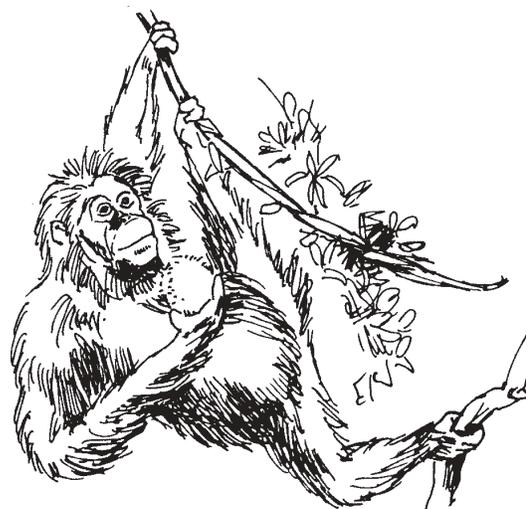
Behavior: Orangutans are active during the day. They are solitary creatures that spend most of their time alone, except for females and their young. Orangutans gather food, eat, and rest for most of the day. They seem to have excellent memories which help them locate fruiting trees

within the forest. Orangutans are known to make and use tools: for example, a hooked branch may be used to bring a fruit-laden branch within reach. At night, orangutans make a leafy nest of branches about 30-70 feet off the ground.

Reproduction: Females begin to bear young at about 8 to 10 years of age. They may have one young every three to four years. Baby orangutans spend the first year of life clinging to their mother's chest or back. The orangutan does not leave its mother until it is about 6 to 8 years old.

Conservation: Orangutans are critically endangered. Poaching and destruction of the rain forest have caused this decline. Scientists estimate that there are fewer than 10,000 orangutans left in the wild.

It is now illegal to sell, kill, or keep wild orangutans in Indonesia. Zoos around the world have agreed not to remove any orangutans from the wild; instead, zoos are making efforts to breed orangutans in captivity. Former pet orangutans are rehabilitated and released into the wild.



Animal Facts:

Sumatran Tiger

Class: Mammalia

Scientific Name: *Panthera tigris sumatrae*

Range: Island of Sumatra, Indonesia. Nearly all of the tigers live in five national parks on the island.

Habitat: Rain forests and grasslands near water

Natural Diet: Deer, water buffalo, wild pigs, wild cows, snakes, fish, frogs, birds

Zoo Diet: Commercially prepared meat diet

Physical Characteristics: Sumatran tigers are the smallest of the five types of tigers. The average length is 7 to 9 feet. Males weigh about 275 to 300 pounds; females weigh 150 to 175 pounds.

Compared to other types of tigers, Sumatran tigers have longer cheek hair and more closely set black stripes. The striped coat offers excellent camouflage in the tiger's natural habitat.

The tiger is a powerful predator. Long sharp canine teeth, sharp claws, and great strength enable the tiger

to kill prey much larger than itself. After stalking its prey, the tiger rushes at the animal from the side or the rear (to avoid being gored by horns or antlers). Grabbing the prey with its front paws, the tiger bites the animal's neck or throat. The prey dies from a broken neck or by suffocation.

Behavior: Tigers are active at night. During the day, they rest and sleep. Sometimes tigers cool off in ponds or streams. They are surprisingly good swimmers.

Tigers leave scent marks by spraying urine or depositing feces along the borders of their territories. Tigers live alone, except for females raising cubs. Sometimes, tigers are seen together feeding at a kill-- usually, this involves a male allowing a female and her cubs to eat while he waits his turn.

Reproduction: Tigers breed by age 3 or 4. Females give birth to 2 to 6 young (usually 2 or 3). The young are blind and helpless at first, and are nursed by the mother for 6 to 8 weeks. Soon the cubs tag along on hunting trips with their mother; by the time they are 11 months old, the cubs are able to hunt on their own. They remain with their mother until they are 2 or 3 years old.

Conservation: All types of tigers, including the Sumatran tiger, are critically endangered. The greatest threat to the tiger is loss of habitat: as forests are destroyed, the tiger is restricted to an ever-shrinking area. Poaching is another threat.

Only about 500 Sumatran tigers remain in Indonesia. Already, the Java and Bali tigers (also from Indonesia), are extinct. The Sumatran tiger is legally protected by the Indonesian government, and it lives in several protected parks and preserves.



Evaluation Form

Indonesian Rain Forest Zoo Activity Packet

Dear Teacher:

Please take a few minutes to fill out and return this evaluation form. Your input will help us improve our teacher resource materials in the future.

Return in the envelope provided or mail to Education Department, Fort Wayne Children's Zoo, 3411 Sherman Blvd., Fort Wayne, IN 46808. Thank you for your time and effort!

SCHOOL or GROUP NAME: _____

GRADELEVEL: _____ DATE OF VISIT: _____

1. Were the materials and activities appropriate for your grade level? _____

2. Which work sheets did you use? _____

3. Which activities did you try? _____

4. Which of these were enjoyed most by your students? _____

5. Did you create or modify any activities to supplement this packet? If so, we would appreciate receiving a copy to include in future packets or to distribute to teachers on request.

6. What other materials would you like to see included in the packet? _____

7. Additional comments: _____

