Rainforest Life

Objective:

1. Students will demonstrate an understanding of the rainforest environment.
2. Students will be able to identify reptiles and amphibians in a rainforest habitat.
3. Students will be able to explain how reptiles and amphibians cohabitate and thrive in a rainforest ecosystem.

Grades: 6 - 8

Related Literature:

The Mystery of the Amazon Rainforest
Carole Marsh

In search of Lost Frogs
Robin Moore

Extinction in Our Time
James P. Collins

Performance Objectives:

Grade 6: Strand 4 – Concept 1: PO 6
Strand 6 – Concept 2: PO 1
Grade 7: Strand 3 – Concept 1: PO 1-2
Strand 4 – Concept 3: Concept 1-2
Grade 8: Strand 3 – Concept1: PO 1-2
Concept 4: PO 1
NGSS: MS – LS 1. A; LS 2. A; LS 4. D
SS: 6-8. W. 2

Background Information:

The term, rainforest, is used specifically to describe areas of the world that are covered with lush vegetation, teaming with life and receiving between 80 and 100+ inches of rain each year. Tropical rainforests have a warm climate, high humidity, significant rainfall and a variety of animal and plant life. One well-known tropical rainforest area is the Amazon River Basin. The Amazon River flows for hundreds of miles through one of the largest rainforests on Earth. On either side of the river, the forest temperature is averages 80 degrees year-round, with almost 160 inches of rain each year. The Amazon River provides a life-sustaining freshwater environment for countless fish, amphibians, reptiles, insects, and mammals. In addition, the plants in the region produce oxygen for the planet along with fostering a vital ecosystem for living organisms.

Life in the tropical rainforest can be a challenge due to the abundance of living creatures and the constant search for food and shelter. Various species must adapt to life in the rainforest to survive. Over time, animals and plants have modified their behavioral patterns to flourish in this diverse and unique ecosystem. For example, the Jackson's chameleon uses its color, which can change rapidly, to blend in with its surroundings for protection. This cold-blooded reptile prefers to live in the branches of trees and plants. Once its body is warmed by the sunlight, the chameleon begins its daily search for food. The opposable toes on each foot offer the chameleon tremendous gripping power as it creeps along the branches.

The Jackson's chameleon is easily recognized by its three-horned head, which resembles a prehistoric creature. While this reptile moves slowly among the branches, its lightening-quick tongue makes it an efficient predator. The chameleon has 360-degree vision, which allows it to se in every direction at once and easily spot its prey. Survival for the Jackson's chameleon is dependant upon its ability to begin an independent life for itself once it is born. Jackson's chameleons are viviparous, which means they give birth to live offspring. These young chameleons begin the hunt for food shortly after birth and the parents do not care for their young. Less than two inches at birth, these chameleons can grow to between 10-15 inches long as adults. Whether young or adult, chameleons have adapted to life in the rainforest through their use of camouflage and efficient hunting.

The density of trees and plants in a rainforest offers housing for numerous species. Of the various living creatures in the rainforest, reptiles and amphibians have adapted to life in the trees and in the dense litter of the forest floor. Rainforest trees include three distinct layers: the understory layer, the canopy layer, and the emergent layer. Each layer is determined by the height of the plant life. The understory layer is closest to the forest floor and receives only about 2-15% of the sunlight. The green tree python is one reptile that moves about the trees and the forest floor. With a fairly slim body, the green python can grow to six feet in length and weigh almost five pounds as an adult. Pythons can be recognized by

their large head and angular snout. This python lives mainly in the branches, but can sometimes be seen on the forest floor. The green python enjoys looping a coil around a branch and resting its head in the middle of the coils.

The bright green color is similar to the leafy foliage on the trees in the rainforest which makes excellent camouflage for the reptile. The green tree python's natural prey is small rodents, small mammals and other snakes, and he may ambush his prey from a tree branch above. These snakes can live up to 20 years, and will reproduce many times in their lifetime. The green tree python lays about 6 to 30 eggs in holes in trees or in plants. Once hatched, the baby pythons are on their own to live independent lives in the forest. Young pythons are often hunted by large birds of prey and must continue to find shelter among the dense trees.

The air is cooler under the leafy layers and perfect for orchids and ginger plants to grow. Small birds, insects, and some amphibians find their home in the understory layer. Plants make suitable housing for insects and small amphibians. Scientists believe that rainforests are alive with thousands of different plant species. Many of these plants have been found to contain life-sustaining medicinal qualities helpful in the manufacturing of medicines for humans. A perfect example of an understory creature that lives among the plants is the poison dart frog. These beauties look like shiny jewels, but they secrete toxins from their skin that can be deadly to others. Their beautiful bright colors act as a warning to predators to stay away. Dart frogs are small but mighty creatures about one and a half inches long. They communicate with vocal sounds and can be identified by their calls. Dart frogs prefer to eat ants, termites, and other small insects. Most species of dart

frogs lay their eggs in a gelatinous mass. The eggs hatch into tadpoles that climb on the back of the parent frog, that then carries them to a pool of water where they begin the journey to adulthood through metamorphosis. As young dart frogs, they live independently among the many frog species in the rainforest.

Reptiles and amphibians in the rainforest have adapted to life in their own habitats. Scientists believe that there are countless undiscovered species in the rainforests and each with its own unique type of shelter, food, and behavior. Due to the density of the rainforest, many species may exist in the more remote areas that are difficult to see or reach. The canopy layer of the forest extends approximately 90 feet above the ground. Trees in this layer are covered with vines and other plants, which is a popular place for large parrots, Morpho butterflies, and squirrel monkeys. The emergent layer is the upper most part of the rainforest. The tallest trees can reach heights of 200 feet above the forest floor. This layer receives the most sunlight and acts as an umbrella for the layers below. Harpy eagles and howler monkeys are common residents of the emergent layer.

As populations of species continue to flourish in the rainforest, scientists continue to discover more species that can coexist in the environment. Among the most interesting are giant day geckos. With a bright green body and a red stripe down its back, the giant day gecko can also be recognized by the red dots along each side of its back. These geckos eat various insects and other invertebrates. They also like sweet fruit nectar and pollen. Territorial by nature, males can be aggressive when protecting their habitat. Giant day geckos lay pairs of eggs that hatch in about 80 days.

A neighbor of the giant day gecko is the leaf-tailed gecko. Notice how the tail is flattened and almost looks like a tree leaf. These lizards can grow up to 12 inches long, and are usually beige in color with dominant eyes that appear almost pink. This gecko can flatten itself on a tree branch to camouflage perfectly. Known as a carnivore, the leaf-tailed gecko dines on insects and other invertebrates.

The leaf-tailed gecko also sports some interesting feet. This adaptation allows the gecko to move along smooth surfaces. The splayed toes have pads at the end that are covered with tiny bristles used to help the gecko grip branches as it moves.

The emerald tree monitor is another reptile with a name that is reflected in its color. Known for its varied shades of green and turquoise, the emerald tree monitor can camouflage itself well in the leaves of a rainforest tree. Considered arboreal, or tree dwelling, this monitor lizard lives in narrow branches using its tail to assist in holding on and its scaly feet to move around. The monitor eats beetles, stick bugs, katydids, spiders and other similar insects, often tearing off the heads of its prey in order to kill it.

The emerald tree monitor can lay up to three clutches of eggs a year. Each clutch may have five eggs that hatch in about 190 days. Once hatched, the baby monitors eat small insects such as termites.

The tropical rainforest floor can often be deceiving. Within its seemingly quiet, leafy foundation, the forest floor is teaming with hidden life. One such inhabitant of the forest floor is the Giant Ameiva lizard. A reptile of distinctive color, the ameiva has a pointed head, muscled legs, and a slightly forked tongue. These reptiles can grow to 20 inches long and can move quickly under logs and through the leaf litter. Males and females have black spots on their backs and heads, but the males have more brilliant green color on their body. The ameiva eats insects, frogs, and spiders.

The mata mata turtle is a reptile that generally lives in the fresh water of tropical areas. Known for its triangular head, the mata mata is a slow-moving turtle recognized by its nose horn. The turtle's body is rough and bumpy, which may help to camouflage it from predators. These turtles like to live on the bottom of a pond or slow moving river in muddy areas. Mata mata turtles eat mainly fish but will often eat small mammals, birds and insects that cross their path. They eat by sucking their prey into the mouth and snapping it shut. Water is then expelled and the food is swallowed whole. Because of its mouth structure, the mata mata cannot chew its food. The mata mata lays about 12 to 28 eggs that have brittle shells and are deposited in a nest dug by the female. Once hatched, the baby turtles live an independent life.

When you think about species in the tropical rainforest, various amphibians come to mind. Discoveries indicate that there are more than 1000 species of frogs in the Amazon Basin. Most frogs live in or near water; however, many tropical rainforest frogs live in trees and plants. Rainforest frogs can maintain necessary moisture on their skin due to the high levels of constant humidity in the air and the large amounts of rainfall. These frogs can survive well in trees. Some species of frogs have adapted to the environment by leaving streams for the leafy trees in order to escape predators. One amphibian that has chosen the shelter of trees is the White's tree frog. These quiet, docile frogs are very adaptable and can find a home in various environments. The White's tree frog is considered nocturnal and is an excellent climber. Their distinctive call can sound high pitched if in danger, but these frogs are generally quiet and still when resting on a branch.

The tomato frog is an amphibian known to live on the rainforest floor. These frogs burrow in the forest floor to make their home and hide from predators. Tomato frogs have a distinctive color, rightly named, and can puff up with air when threatened. The sticky mucus secreted from their skin is a deterrent to predators. The toxin in the mucus can cause an allergic reaction along with gumming up the mouth and eyes of the predator. Tomato frogs can live up to six years, and eat insects and small invertebrates.

A flourishing ecosystem of living organisms, the tropical rainforest is critical to life on Earth. From its plant life to animals, humans rely on the rainforests for oxygen, freshwater, medicines, food products and a balance in our natural world.

Sources: Smithsonian National Zoo; Animaldiversity.com; The Nature Conservancy; The Rainforest Alliance; San Diego Zoo.
Photos in public domain.

Procedures and Activities:

1. State the learning objective.

2. Read related literature.

3. Discuss the rainforest as compared to other types of forests. Refer to classroom text materials for clarification.

4. Discuss how climate, regional temperature and humidity impact the environment. Ask students to give examples of habitats that vary as a result of location and climate.

5. Present background information and related pictures. Continue discussion of key points in the presentation.

Activity: Students complete the Rainforest Questions and grade in class. Discussion follows.

Activity: Take along or in-class: "Project Investigation" Students select one of the rainforest reptiles or amphibians listed and complete a data sheet on their selection.
List: Cuvier's dwarf caiman; Boa constrictor; Emerald Swift

Activity: "What is A…?" This activity allows students to demonstrate knowledge about reptiles and amphibians living in a rainforest.

Activity: "My Rainforest Drawing" provides students an opportunity to be creative and demonstrate knowledge about tropical rainforests by drawing and labeling the layers. In addition, students add reptiles and amphibians that live in a rainforest habitat.

Reflection and Assessments: Students are assessed on various levels depending on the activity. Participation, grade standards and percentages may be applied.

Rainforest Questions

1. How many habitat layers are in a rainforest?
   a. 2
   b. 3
   c. 4
   d. 7

2. Where do dart frogs lay their eggs?
   a. in a pond
   b. on leaves
   c. in the dirt
   d. in a nest

3. In which layer would you find an eagle?
   a. forest floor
   b. understory
   c. canopy
   d. emergent

4. How often does a rainforest get rain?
   a. all year
   b. only in the summer
   c. once a month
   d. only in the winter

5. What adaptation is common among rainforest reptiles?
   a. they smell bad
   b. they use camouflage
   c. they jump high
   d. they have large teeth

6. What layer of the rainforest gets the <u>least</u> amount of sunlight?
   a. canopy
   b. emergent
   c. floor
   d. understory

Rainforest answers:

1. b. (The habitat layers are the understory, the canopy and the emergent layers.)

2. b. (Dart frogs lay eggs on the leaves.)

3. d. (The emergent layer is where Harpy eagles can be found.)

4. a. (Rain falls all year round in a rainforest.)

5. b. (Camouflage is common in many rainforest creatures, including reptiles.)

6. c. (The rainforest floor receives the least amount of sunlight due to the density of the trees and plants.)

Related discussion topics:

The rainforest climate and impact on animal life.

Why certain animals live in different layers of the rainforest.

How can humans protect the rainforests?

Describe different habitats within the rainforest.

Project Investigation

Species Name _____

Geographic distribution _____

Habitat _____

_____

Physical characteristics _____

_____

_____

Diet _____

Behavior _____

_____

Adaptation _____

_____

Amazing facts _____

_____

Picture:

What is a …?

What is a REPTILE?

List 3 main characteristics of a reptile:

1._____

2. _____

3. _____

Give 3 examples of reptiles found in a tropical rainforest:

1. _____

2. _____

3. _____

What is an AMPHIBIAN?

List 3 main characteristics of an amphibian:

1. _____

2. _____

3. _____

Give 3 examples of amphibians found in a tropical rainforest:

1. _____

2. _____

3. _____

My Rainforest Drawing
Instructions

A rainforest is comprised of a forest floor, understory layer, canopy layer and emergent layer. In each layer, a variety of plants and animals coexist in their own habitats.

Using the picture of a tree in the canopy layer, create a drawing of a rainforest which includes each layer and at least 3 reptiles and 2 amphibians living in their habitat. Label your drawing.

Extra: You may also include up to 4 animals or birds that would be found in a tropical rainforest.

*Reminder: Label each layer of the rainforest
Label/name each reptile and amphibian

My Rainforest Drawing

Canopy layer