

ADAPTATION STATIONS

2-3RD GRADE
SCIENCE, MATH

Learning Goals: Students will know what adaptations lemurs have and be able to describe how each helps lemurs survive in their natural environment.

Students will be able to:

- Investigate and describe adaptations that help two species of lemurs survive in two environments: rainforest and tsingy

LESSON DESCRIPTION

Students will participate in five activity stations that highlight the adaptations that help sifaka and red-ruffed lemurs survive in two different habitats found on Madagascar: tsingy and rainforest. The activity stations include 1) Leaping Lemurs 2) Binocular Vision 3) Light and Dark fur 4) Opposable Thumbs 5) Camouflage

Materials needed for all stations:

- Instruction cards or sheets for students; place one at each station
- Paper and pencils for students to list their answers to station questions

Note this activity can be set up as stations around the room for students in small groups, or if available, adults can help students working at stations. The activities can also be done one at a time as part of a larger ongoing lesson.



INVESTIGATING LEMUR ADAPTATIONS

ADAPTATION STATION MATERIALS

Station #1 Leaping Lemurs: large indoor area, sidewalk or blacktop, felt marker, masking or duct tape

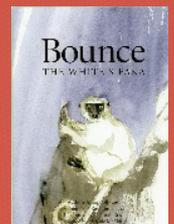
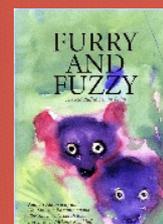
Station #2 Binocular Vision: large washer, small lump of clay, wooden dowel slightly thinner than the hole in the washer, string

Station #3 Light and Dark Coloration: 1 white sock, 1 black sock, sun

Station #4 Opposable Thumbs: masking tape or tube socks with ends cut off, tennis ball, small leaves, small plastic jar with lid, large plastic jar with a

FOR BACKGROUND INFORMATION SEE:

INVESTIGATING LEMUR ADAPTATIONS



FEATURED BOOKS:
FUZZY AND FURRY
BOUNCE THE WHITE SIFAKA

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lid, item with buttons or a zipper, small plastic sandwich bag, tennis shoes with laces

Station #5 Camouflage colors: lemur image to create template, black paper, white paper, Ako Posters that accompany the featured books (Red-Ruffed Lemurs: Masoala National Park, White Sifaka: Bemaraha Tsingy.)

READ AND DISCUSS

1. Introduce the activity to students by reviewing the word adaptation and its meaning: *a physical or behavioral feature that helps an animal survive in a particular environment*. In this activity students will only explore physical adaptations.
2. Explain that you are going to read stories about two different types of lemur. Each lives in a different kind of environment. During the story students should listen and look for pictures and information that describe each environment and each lemur's physical adaptations. You may want students to take notes or draw pictures to help them remember this information for the follow-up discussion.
3. Read *Furry and Fuzzy the Lemur Twins* and *Bounce the White Sifaka*.
4. After completing the stories, ask the class to describe characteristics of the rainforest and tsingy environments and any physical adaptations described in the stories. Use the posters that accompany each book as reference during the discussion. Ask students to describe similarities and differences in the environments and in the lemur's adaptations. List responses on the board in three columns (rainforest / tsingy / both) or as a Venn Diagram.

ANALYTICAL WRITING

Select two of the lemur species and compare the adaptations they have and explain why each of these adaptations is important to their survival.

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5. Explain that through experimentation the class is going to discover some of the ways that sifakas and red-ruffed lemurs survive in two different environments—one hot and dry (tsingy) the other warm and wet (rainforest).
6. Distribute paper and pencils so students can record their answers to the questions posed at each station. These will be used during the wrap-up discussion.

ADAPTATION STATIONS

STATION #1: LEAPING LEMURS

Set up a line of masking or duct tape 35 feet long. Set up a start line at one end of the 35 foot piece. Mark the 35 foot piece every 5 feet. Place an additional piece of tape at 32 feet to indicate how far a sifaka can leap.

INSTRUCTIONS

Have students try their leaping skills by standing at the starting line and jumping from a standing start. Instruct students to write their name on a strip of tape before their leap. When their leap is complete, students should place the tape where they landed so they can compare leaping distances. Pose the question: How does the ability to leap long distances help sifaka and red-ruffed lemurs survive life in the tsingy and the rainforest?

STATION #2: BINOCULAR VISION

Like humans, lemurs have eyes in the front rather than the sides of their heads. Using two eyes gives you depth perception. Closing one eye eliminates one of the clues that your brain uses to judge depth. To see the impact of binocular vision, with one eye closed try this simple task.

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INSTRUCTIONS

Using a lump of clay to support it, stand a large washer on its side. Have students hold the clay so the side of the washer, not the hole, is facing them. Have students stand far enough from the washer so that they must extend their arm to reach it. Close one eye and try to thread a dowel that is only slightly smaller through the hole. Open both eyes and try it again. How does it work? One of the clues that your brain uses to judge distance and depth is the very slight difference between what your left eye sees and what your right eye sees. Your brain combines these two views to make a three-dimensional picture of the world.

Now provide students a piece of string several feet long. Imagine you were a lemur. Stretch the string from just under your nose to the end of your outstretched arm. Imagine the string is a branch. You will see two “branches” (strings) stretching out in front of you. Now look at the string with just your left eye, and then with just your right eye. Notice that the two strings are separate images - one from each eye. The two strings cross at the point on which your eyes are focused. Try looking at different points on the string and notice how the crossover point moves. Pose the question: Why would binocular vision be important if you were a lemur?

STATION #3: WHITE-COLORED FUR vs. DARK-COLORED FUR

Have students place a black sock on one hand and a white sock on the other hand and stand outside holding their covered hands out in the sunlight. If there is no sun out, with adult supervision they can place their hands under a heat lamp. Students can use a thermometer to get a specific reading or just feel the difference in heat absorbed between the two colored socks. Pose the questions: Which hand feels warmer? Why? Why is it advantageous for the sifaka that live in a warmer, drier environment to have white fur?

STATION #4: OPPOSABLE THUMBS

Having opposable thumbs means that the thumb can be move around to touch the other fingers. Not all lemurs have fully opposable thumbs. Some only have semi-opposable thumbs. Opposable thumbs give

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lemurs the ability to grasp things. Lemurs even have toes that can function like an opposable thumb.

INSTRUCTIONS

Set out all material items. Have a helper lightly tape the student's thumbs to the sides of their hands. Alternatively tube socks with the ends cut off can serve as a sort of glove. To ensure there is no interference with circulation, make sure they do not tape them too tightly. Students should still be able to move their four fingers. Instruct students to try each of the following activities without using their thumbs:

- Pick up a small leaf from a flat surface
- Pick up a coin from a flat surface
- Open a small jar
- Open a large jar
- From 10 feet away toss and catch a tennis ball with another thumbless student
- Seal a small plastic sandwich bag
- Tie a shoelace

Pose the following questions:

- Which activity was the hardest/easiest to do without your thumbs?
- How much longer did it take to do the activities without your thumbs?
- What activities might a lemur have to do that would be difficult to do without opposable thumbs?
- How would opposable thumbs help a lemur survive in the rainforest and in the tsingy?

STATION #5: CAMOUFLAGE COLORATION

Have students cut out the shape of a lemur out of white paper (to represent a sifaka) and one shape of a lemur out of dark brown paper (to represent the red ruffed lemur). Alternatively, have students color one

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lemur like a red-ruffed lemur and the other like a white sifaka. Once the shapes are cut out, have students take turns placing the shapes in front of the Masoala (rainforest) and Bemaraha (tsingy) posters.

Pose the following questions: Which colors blend and which stand out in each environment? How would blending in help a lemur survive?

MATH EXTENSION

After the activity you may want to measure and label how far each student leaped in Station #1 and use the data to create a bar graph.

OUTDOOR EXTENSION

Take the camouflage experiment outside. Sprinkle different colored toothpicks on a grassy area. Count the number of each color of toothpick before sprinkling them. Divide students into small groups (four or less). Explain that they are owls flying over the rainforest searching for mouse lemurs for food (represented by the toothpicks). They have one minute to find and pick up as many mouse lemurs as they can. After the activity students should count and record the total number of toothpicks collected and how many of each color was collected. They will notice that greens and darker colors are typically collected less often since they are more camouflaged. You may want to have students graph their findings.

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EVALUATION

Review the student's written and verbal responses to the adaptation station questions to check for understanding of key learning concepts.

THIS ACTIVITY MEETS THE FOLLOWING NATIONAL AND FLORIDA EDUCATION STANDARDS

FLORIDA STATE STANDARDS

2nd Grade Science

SC.2.L.17.1

SC.2.N.1.1

3rd Grade Science

SC.3.N.1.1

SC.3.N.1.3

NATIONAL SCIENCE STANDARDS

2nd and 3rd Grade

Characteristics of organisms

Organisms and environments

Form and Function

NEXT GENERATION NATIONAL SCIENCE STANDARDS

2nd grade: Interdependent Relationships in Ecosystems (2-LS4-1)

3rd Grade: Interdependent Relationships in Ecosystems (3-LS4-3)

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STATION #5 - Camouflage Coloration

Directions: cut out a lemur and color one red-brown and black like a red-ruffed lemur and leave the other white like a white sifaka. Which blends in better on their habitat poster?

