

LEMURS HAVE CLASS!

4-5TH GRADE
LANGUAGE ARTS, SCIENCE

Learning Goals: Students will know how to use a dichotomous key flow chart and how scientists classify apes, monkeys, prosimians, and lemurs.

Students will be able to:

- Identify lemurs as prosimians
- Distinguish the various groups of primates, including apes, monkeys and prosimians, based on their characteristics
- Construct and properly use a dichotomous key flow chart

LESSON DESCRIPTION

Students practice their classification ability. In groups, they research and construct a dichotomous key flow chart to classify 8 primates including apes, monkeys (new and old world), lemurs and other prosimians. They then see if others can use their keys. Afterwards students research how scientists classify lemurs.

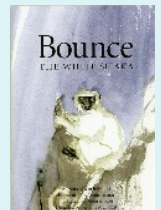
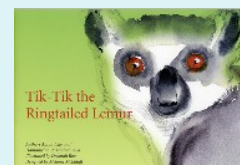
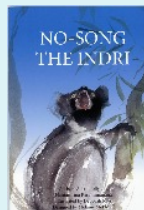
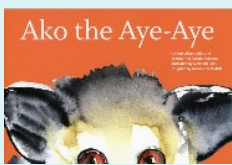
Materials needed:

- Primate Picture Cards (8 per team)
- Blank dichotomous key flow chart (3 per team)
- Pencils and paper
- Research materials (books and web) including field guides or keys showing animals by classification
- A drawer with a variety of fasteners like rubber bands, paperclips, screws, clothes pins, etc.
- Students' left shoes

1 HOUR

LOOKING AT LEMURS

FEATURED BOOKS



FOR BACKGROUND INFORMATION SEE: *LOOKING AT LEMURS*

READ AND DISCUSS

1. Have the students independently read the Ako series. As they read they should note differences in each of the main character's physical features, based on the text and illustrations.
2. Introduce the term classification by asking the students to first think about their closet. Is it organized? Is it messy? What's the advantage to having an organized closet? (It's easier to find and identify items; it's easier to see clothes that go together). If you were to sort the clothes in your closet what are some of the

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ways you might group them? List their responses on the board. Examples might include color, type of item, and old vs. new.

Now imagine all of the animal life on Earth. Scientists believe that Earth is home to over 10 million different kinds of animal life forms, or species. This includes 30,000 species of fish, 11,000 reptiles, 10,000 birds, 7,000 amphibians, 5,000 species of mammals and 1 million named species of insects! Imagine trying to study and understand the lives, patterns, behaviors and evolution of so many different kinds of organisms.

In order to make their job easier, scientists classify living things into groups based on how they are the same and how they are different. Classifying life forms into groups makes it easier to identify species and to see connections in their genetics. This process is called **classification** or **taxonomy**. Explain that classification can be complex since animals that look similar may not always be related and animals that seem very different may have a distant relationship. Also, classifications often change as we learn more about the natural world. New species are described everyday.

3. Divide the class into six groups and assign each group one of the books. Have students work as a group to generate a list of the characteristics of the characters, then write these on the board. Circle those that are common to all. For instance, all have tails, large forward facing eyes, upright ears and elongated dog-like snouts or muzzles. Remind them some similarities are harder to see—like nails instead of claws, a “toilet claw” on their second toes and tooth comb for grooming. Differences might include fur color and texture, size, and tail length and shape.

4. Explain that students are going to practice classifying primates

ANALYTICAL WRITING

Think about the different primate species you have been researching. How is each group similar and different? Choose one species and compare yourself to that species. How do you compare?

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(lemurs and their “relatives” like apes and monkeys) by creating a dichotomous key. A dichotomous key is a biological tool that scientists use to classify organisms into distinct categories based on their similarities and differences. It is constructed of several couplets (a set of two statements.) Each statement of the couplet describes a certain characteristic of the organism being classified. Then a choice is made between the two statements that best fits the organism. The initial couplets are constructed with statements that contain broad characteristics of the organisms being classified. For example: apes vs. monkeys. As couplets progress in the dichotomous key, the characteristics become more specific. For example: weight (under one pound) vs. (over one pound.)

5. Before students create their dichotomous key for primates, you may want to have them first practice their classification skills by trying one of these classification activities:

ACTIVITY ONE: JUNK DRAWER

1. Bring out a junk drawer filled with fasteners such as paperclips, rubber bands, screws, buttons, alligator clips and clothespins. Alternatively, ask students to each bring 10-15 random items smaller than a baseball as homework the day before the activity. Have students look at the jumble of items. Would it be easy to find and identify items in this state?
2. Give each group a small mixed pile of the items. First have them split the group into two groups based on their function (office use, laundry use, etc.) Then further divide these groups into smaller groups based on other criteria.
3. Gather the items and try sorting again this time based on how they look. Have groups divide into two groups based on shape, texture, color etc. Now divide it further based on appearance. Continue to have students subdivide the items into smaller groups based on their appearance.

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ACTIVITY TWO: SHOE KEY

In this activity, students develop a dichotomous key to identify each student's left shoe.

1. Have each person take off his or her left shoe and toss it into a big pile. As a class observe and discuss the different characteristics of the shoes (e.g., color, material).
2. Have the students decide how to divide the shoes into two groups so that all the shoes in a given pile share a common characteristic. (For example: shoes with laces vs. slip-on shoes or leather shoes vs. cloth shoes.)
3. Continue to sub-divide each group into two based on other characteristics until each shoe is in its own group. Complete the flow chart on the board as you go through the process to provide students with a visual reference. Have students practice using the chart on the board to identify each person's shoe.

CREATE A DICHOTOMOUS KEY

Now that students have had the opportunity to practice their classification skills, they are going to work in small groups to create a dichotomous key flow chart for eight primates from the list below.

1. Break the class into small groups of 3-4 students. Provide each group with 8 pictures of primates copied from the Activity Sheet. Each group should receive three lemur species and one species from each of the other primate groups. The specific species should vary from group to group.
2. In their groups students should create a dichotomous key for their eight primates based on the animal's physical similarities and differences. As a group students should fill in and complete one of the blank dichotomous key flow charts with their criteria. When they are finished they should complete a second flow chart, but this time it should only list the criteria (characteristics). The boxes for the primate species to be listed should be left blank.

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3. Have each group swap their second flow chart and pictures with another group to see if they are able to use the dichotomous key and fill in the species boxes correctly. Could the review team follow their key and place each of the eight primates in the proper place?

WRAP-UP

- What is the purpose of classification? (Students should conclude that classification systems are used to categorize animals based on similar structures, forms and ancestry.)
- Based on your observations and research, generate three rules that must apply to an animal for it to be classified as a primate. Students should include at least some of the following primate characteristics: it must be a mammal, a vertebrate, have a large brain compared to body size, binocular color vision, five fingers, five toes and an opposable thumb (there are a few exceptions).
- How are prosimians different from monkeys and apes? Unlike all other primates, prosimians have moist noses and rely on their sense of smell more than their vision. Since they are not as dexterous as other primates they use their teeth as a comb instead of using their hands. Since prosimians are generally nocturnal, they share a characteristic of other nocturnal mammals—a layer of reflective cells called the tapetum lucidum—that allows them to see well in low light conditions.
- Compare and contrast the different species in each family. Why do they look different even though they are in the same family? (Students' answers will vary but they should conclude that each type of primate is specially adapted to its lifestyle and habitat).
- Why are characteristics such as color and behavior sometimes difficult to use for classification? (These characteristics can change, sometimes as the animal matures, or with different environmental conditions).

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ZOO EXTENSION

Continue having students practice their dichotomous keys by using their primate keys during their visit or by creating keys for mixed-species exhibits found at the zoo. If mixed-species exhibits are not featured, then examine a section of the zoo (zoogeographic, taxonomic, etc) for suitability.

OUTDOOR EXTENSION

Have students create a key for local wildlife. Birds or flowers are good options. Then take students outdoors to the school garden or a local park to use the keys to identify the species around them.

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EVALUATION

Have students use a dichotomous key to identify local trees or flowers. Evaluate their ability to use the key and understanding of how it works rather than correct identification of the plant.

THIS ACTIVITY MEETS THE FOLLOWING NATIONAL AND FLORIDA EDUCATION STANDARDS

FLORIDA STATE STANDARDS

4 th Grade	5 th Grade
SC.35.CS-CS.2.3	SC.5.N.2.1
SC.4.N.1.4	SC.5.L.17.1
SC.4.N.1.7	
SC.4.N.1.6	

NATIONAL SCIENCE STANDARDS

4 th Grade	5 th Grade
Characteristics of organisms	Structure and function in living systems
Organisms and environments	Reproduction and heredity
Characteristics and changes in populations	Regulation and behavior
Form and Function	Populations and ecosystems
	Diversity and adaptations of organisms
	Populations, resources and environments
	Natural Hazards
	Risks and Benefits
	Evolution and equilibrium
	Form and Function

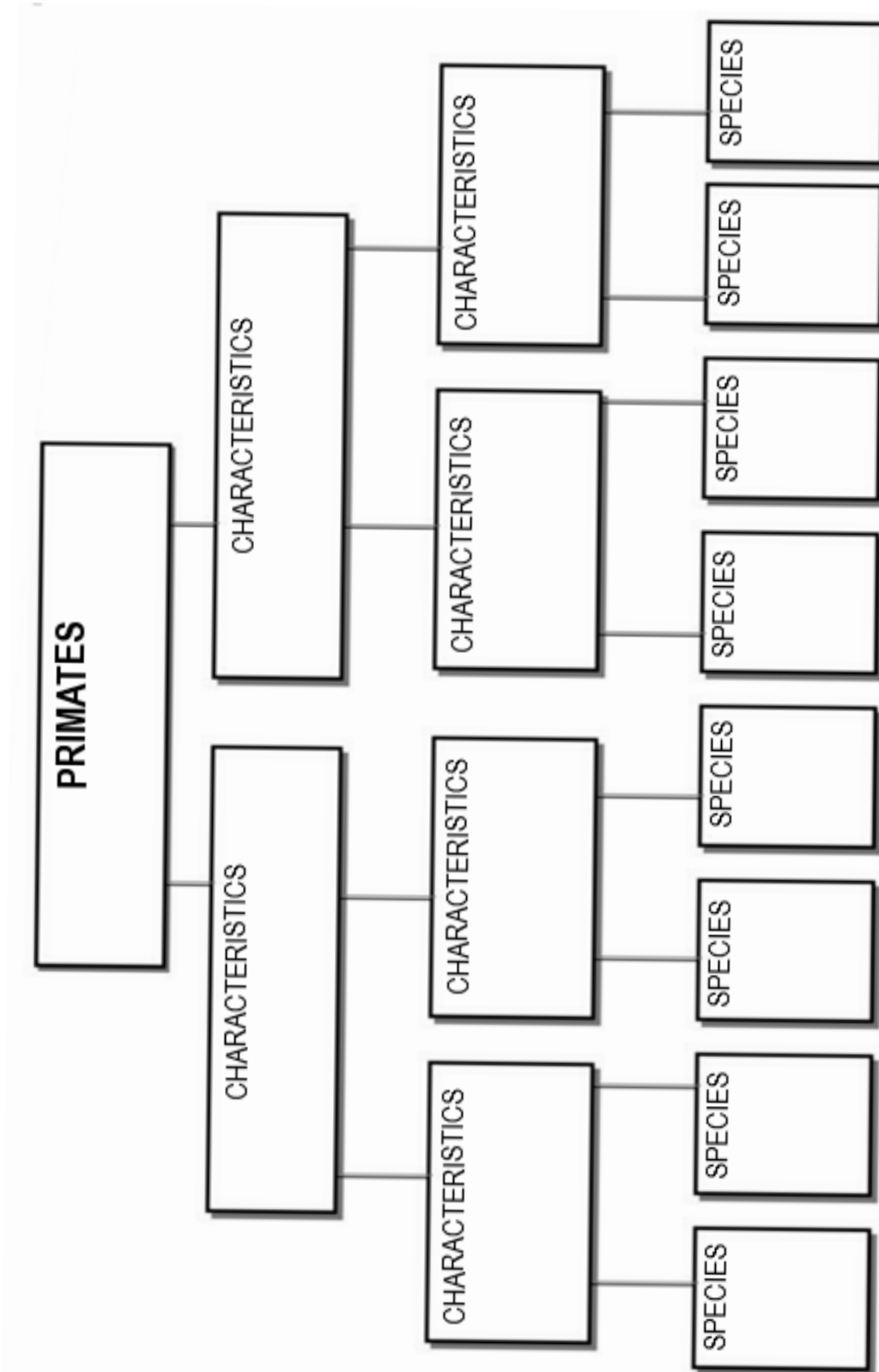
NEXT GENERATION NATIONAL SCIENCE STANDARDS

4th grade: Structure, Function and Information Processing (4-LS1-1)
5th grade: Earth Systems (5-ESS3-1)

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MANDRILL
Mandrillus sphinx



COMMON MARMOSET
Callithrix jacchus



GOLDEN LION TAMARIN
Leontopithecus rosalia



RED-SHANKED DOUC LANGUR
Pygathrix nemaeus

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SUMATRAN ORANGUTAN
Pongo abelii



PHILIPPINE TARSIER
Tarsius syrichta



MADAME BERTHE MOUSE LEMUR
Microcebus berthae



RED-RUFFED LEMUR
Varreacia rubra

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SENEGAL BUSH BABY
Galago senegalensis



POTTO
Pterodicticus potto



PROBOSCIS MONKEY
Nasalis larvatus



WESTERN LOWLAND GORILLA
Gorilla gorilla

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COQUEREL'S SIFAKA

Propithecus coquereli



RING-TAILED LEMUR

Lemur catta