II. Lemur Cart

CONCEPTS

Grade 1 Standards
1. Heredity: Make observations to construct an evidence account that **young plants and animals are like, but not exactly like, their parents.**

We do not have baby lemurs in our exhibit because with all our different species that do not live together in the wild, it would not be safe to have them breed.

2. Use materials to design a solution to a human problem by mimicking **how plants and/or animals use their external parts to help them survive, grow and meet their needs.**
How do the lemur's hands and feet, fur, and big eyes and tails help them find food and protect them so they can survive in the trees and on the ground?
The padded hands and feet equipped with nails and semi-opposable thumb allow them to run through the trees and leap to catch themselves. Their larger second nail, along with their incisors, helps them keep their protective fur clean from their sticky fruit diet. Their thick fur protects them from the rain. Their large shiny eyes allow them to see in the dark forests where most live, and their long tails help them balance in the trees and make them look larger on the ground. Their long snouts (compare the lemur skull with the monkey skull) give them an excellent sense of smell to find their main food—fruit.

3. Read texts and use media to **determine patterns in behavior of parents and offspring that help offspring survive.**

We have no babies to observe this, but we know that red-bellied lemur parents and the ruffed lemur parents share in caring for their young; how is it important when parents share their duties?

Grade 2: Standards
1. **Make observations of plants and animals to compare the diversity of life in different habitats.**

Where do our lemurs live and how do they share their space?
Our lemurs tend to stay in their separate species groups, as they do in the wild. They live mainly in the trees.

Grade 2: Develop a simple model that mimics **the function of an animal in dispersing seeds or pollinating plants.**

How do lemurs in the wild disperse seeds and or pollinate plants?
Lemurs eat fruit primarily, so as and after they eat the fruit, they will naturally spread they fruit's seeds in their cast-offs or in their feces (pooh).

Grade Three Standards

1. Animal traits can be influenced by the environment.

Where do you see most of our lemurs?

Most lemurs are arboreal, living on the top of the canopy or in mid-level forest.

How does the lemur skull look different from the Languer monkey skull?
How might to longer snout/nose help the lemur find food?

Their long snouts give them an excellent sense of smell to find the fruit they like to eat in this forest. Also, they have wet noses that easily pick up the scents they leave behind from the glands they have on their wrists, chests and anal areas in this thick forest.

Have you heard our lemurs? Why might they be calling out?

Our black and white ruffed lemurs make loud, dramatic sounds to define their territory in the thickly leafed trees.

What might be scary about living mainly in the trees?
What do the lemurs have to be able to do to live and run successfully in the trees without falling?

Show the foot and tail:
Their foot structure gives them a good grip in the trees and their long tails help them balance as they run along the branches. Their thick fur shed water in the rain.

2. Animals form groups to help them survive.
Can you see any of our lemurs hanging out with others? Are they with their own kind or with others? Why might that be?

Lemurs are social animals and, like most primates, live in family or extended groups. Since our lemurs to not live in the same space in the wild as they do in our exhibit, they really do not mix with others. The females are usually dominant in the groups and lemurs use their scent

glands and vocalizations to communicate within the group. Like other primates, they also practice social grooming to keep their fur clean.

3. In a particular habitat, some animals survive well, some less well and some not al all, and when that environment changes, the types of animals that live there may change.

Where do lemurs live and what difficulties do they have in trying to survive?

Lemurs live only on the island nation of Madagascar, which has many other endemic species, and are endangered by the loss of habitat—mainly trees—to deforestation for growing crops, grazing cattle, and the unsustainable crop of charcoal. Of the 100 species of lemur still surviving on Madagascar, 24 species are identified as "critically endangered", 52 as "endangered", 19 as "vulnerable", 2 as "near threatened".

What steps do you think we should take to protect and preserve these rare and wonderful animals?

Some steps that have been taken are introducing solar cookers to eliminate the need for charcoal and supporting sustainable farming of coffee, vanilla, cloves and raffia. (Show samples on cart.)

Grade Four

1. Plants and animals have internal and external structures that function to support survival, growth, behavior and reproduction.

What do you notice about our lemur's skull that might help its survival?

How do their big eyes help them in the forest?
Most lemurs were originally nocturnal; they live and looked for food at night, so they needed big eyes. In addition, like most cats they have a reflective layer called a tapetum lucidum behind the retina of the eye that reflects light coming in back out and acts as a kind of flash light for the lemurs to see better in the dark forest.

If they are fruit eaters, how do they keep their fur clean?
Many of the ruffed (thick neck fur) lemurs hang upside down while eating fruit. How does this behavior help them keep their fur clean?

Look at the skull and the paw. How might their incisors and long claw help them clean their fur?

Also, what we cannot see is that lemurs have two tongues, the regular tongue and a second smaller tongue made of cartilage that is used to clean out the hairs that get stuck in the incisor toothcomb.

2. Animals receive different types of information through their senses, process the information in their brain, and respond to the information in different ways.

Look at the skull. Why do lemurs need such a long nose? What are they smelling?

They communicate by spreading their scent through glands on their wrists, chests and anal areas. They also have wet noses and large olfactory lobes in their brains because smell is essential to find food and establish territory.

See note above on vision and vocalizations.

Grade 5

Food is necessary to carry on all the functions of life. Animals derive their food from a variety of sources. All food sources can be traced back to plants. Plants get their energy from the sun.

Madagascar is primarily a tropical island with long days, a dry season and a rainy season. The lemur's diet of fruit needs rain and sun to grow. In another location without large sources of fruit, lemurs would not survive. Look at this kibble. Since San Francisco does not have a tropical climate and cannot support the kinds of fruit trees our lemurs need, we give them a special diet. Our lemurs get their main nutrition from this kibble, but we put different kinds of fruit in their forest so that they can forage as they do in the wild. You will notice how our lemurs like the sun and our sun lamps when it is cold and overcast.