The Zoological Society of San Diego’s

WILDLIFE WIZARDS

An after-school program providing wildlife activities and conservation action projects for students ages 8-11.
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Introduction to the Zoological Society of San Diego's

**WILDLIFE WIZARDS**

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The living world around us has so much to offer, from the beaches of San Diego to the bamboo forests of China. The Earth gives us our water to drink, our air to breathe, and the food we eat. By learning how the Earth works, we can better understand how we can give something back to the planet that gives so much to us. The Zoological Society of San Diego (ZSSD) has created a fun way for students to learn about the world around them—the Wildlife Wizards program.

The ZSSD operates the San Diego Zoo, the San Diego Wild Animal Park, and the Center for Reproduction of Endangered Species (CRES). CRES is where researchers work to help save endangered animals all over the world. Wildlife Wizards are going to discover where these researchers are working, what they are doing, and what kinds of things the Wildlife Wizards can do to help.

Employees from different ZSSD departments work together to help save endangered animals at home and abroad. For example, biologists from CRES recently visited the Michoacan area of Mexico to study monarch butterflies. They learned that the forest where the butterflies live is being cut down for firewood and farming. A team of conservation-minded employees followed the biologists on their next visit to Mexico to work with the local people who live near the forests. The team hoped to help the people find ways to use less wood from the forest to cook and build their homes. Employees also helped out by doing workshops and community outreach programs on conservation issues and how to live a sustainable life. Both ZSSD employees and the local people living in monarch butterfly habitat learned the importance of conserving all of the world’s natural resources. After all, our planet is one large, connected ecosystem. What we do today will effect our planet tomorrow.

**The Wildlife Wizards’ Mission**

- To learn about worldwide biodiversity and culture.
- To learn how to be leaders and problem solvers for the environment and the community.
- To develop an understanding of wildlife conservation and biodiversity through local action, reading field notes from researchers, and through informal discussions.
Format of Activities
The Wildlife Wizards packet is designed to support after-school programs that are led by an adult coordinator. Each module provides information and activities for two months of after-school meetings. In addition to the meeting activities, additional activities and field trip extensions are given to enhance each module.

An introduction activity presents an overview of what students will learn and participate in during the program. Following the introduction activity there are four two-part modules. The theme of each module is based on a ZSSD field researcher and their recommendations on how students can help conserve biodiversity worldwide through local action.

Each module has two parts:

A) Meet a Researcher
   Overview
   Introduction
   Activity Suggestions
   Researcher’s Biography
   What You can do to Help
   Activity(s)
   Wrap Up

B) Local Action Project
   Overview
   Introduction
   Activity(s)
   Activity Suggestions
   Wrap Up
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INTRODUCTION TO PROGRAM

Activity: What in the World is a Wildlife Researcher?

Overview
Students will explore field research equipment and learn about the researchers their group will support.

Materials
• Backpack Discovery Worksheets
• Four backpacks (Each backpack represents a different part of the world. Below is the list of areas and animals, and suggested items for each backpack).

Backpack #1: China, Giant Panda Bear — Binoculars, map of China, waterproof marker, clipboard, stopwatch, compass, heavy sweater, image of giant panda

Backpack #2: Turks and Caicos Islands, Island Iguana — Binoculars, map of Caribbean, waterproof marker, clipboard, medium-size fishing net, compass, sunscreen, image of island iguana

Backpack #3: Argentina, Owl Monkeys — Binoculars, map, waterproof marker, clipboard, flashlight, compass, hiking boots, image of owl monkey

Backpack #4: Southern California, Desert Bighorn Sheep — Binoculars, map, waterproof marker, clipboard, earplugs, compass, hat, image of desert bighorn sheep

Procedure
1. Ask students, “Who here has been to the San Diego Zoo or the Wild Animal Park? What favorite animals did you see? There are animals at the Zoo and Wild Animal Park from all over the world: pandas from China, condors from California, iguanas from Fiji, and elephants from Africa. There are also people who take care of the animals at the Zoo and the Park. Did you know that the Zoological Society of San Diego has people working all over the world to learn more about these animals in the wild to help conserve or save them? We call these people ‘researchers.’"

   “To start off your first meeting, we need to bring out the researcher in you. A researcher needs many things when going out on a journey or exploration. Can anyone guess what some of those items may be?” (Take a few answers).

2. Break students into four teams. Each team gets a backpack.
3. Students need to designate a recorder to write down their answers.
4. Each team has 15-20 minutes to review the items in their backpack. They write the items on the worksheet and guess what the researcher is studying and in what part of the world.
5. Students will have one person on their team announce their answers to the group when all teams are done with the activity.
**Backpack Discovery Answers**

(for the coordinator)

**In general:**
- Compass
- Binoculars — To observe a variety of wildlife
- Waterproof marker and clipboard — To collect data on animals and plants in the field
- Map — Indicates location of study site
- Images — Indicates species being studied

**Backpack #1: China, Giant Panda**
- Stopwatch: Researchers record the behavior of pandas by using a stopwatch and writing down the time at which each behavior occurs.
- Warm sweater: The panda is found in regions of China where it snows.

**Backpack #2: Turks and Caicos Islands, Island Iguana**
- Net: Researchers use a net to catch iguanas on these islands in order to take blood samples and place tracking equipment on the animals.
- Sunscreen: Turks and Caicos Islands are in the Caribbean, which gets a lot of sun because it is close to the equator.

**Backpack #3: Argentina, Owl Monkeys**
- Flashlight: Researchers who study owl monkeys, a nocturnal primate, do their data collecting in the evenings.
- Hiking Boots: The habitat where the owl monkey lives, the Chaco, has a difficult and often muddy terrain.

**Backpack #4: Southern California, Desert Bighorn Sheep**
- Earplugs: Researchers track bighorn sheep populations by observing them from a helicopter. Earplugs help block the noise so they can focus on their data collection.
- Hat: The desert habitat is a hot and sun-filled environment that requires a hat to block the sun's harmful rays.
### BACKPACK DISCOVERY WORKSHEET

Work as a team to discover the items researchers use to study their animals in the wild.

1. Assign a person to write down each item in the spaces below.
2. Write down the group answer for why the researcher needs the item and what it’s used for.
3. Talk together about why the researcher needs the item and what it may be used for.
4. When we’re all done, have a team member share your answers with the rest of the group.

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<th>What is it?</th>
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Activity: Researchers’ Relay Game

Overview
Students will participate in a relay race and practice working as a team.

Materials
• Backpacks from previous activity (with equipment)

Procedure
1. **Review Teams:** Students will stay in the same groups and prepare for the Researchers’ Relay.
2. **Preparing Students:** Tell students to imagine that they are preparing for an expedition to visit the area of the world their backpack represents to study their animal. The problem is that only one team will be able to go at a time, and the coordinator of all the research teams does not know which team should be picked to go first.
3. **Strength and Endurance in Research:** Researchers need to be quick and in good physical shape to work in the field for long periods of time. Knowing this, the coordinator decides to have a relay race with the teams to decide which one of them will get to go on their expedition first.
4. **Researchers’ Relay:** Students will pretend to be those teams and prepare for a relay race where they need to do much more than just running.
5. **The Relay:**
   • Each team will place their backpack and its contents on the other side of the running field.
   • Each team member will run out, one at a time, and grab an item. (ONLY ONE ITEM.)
   • The team member then runs back and hands the item to the next person, who will run out and grab another item. (Does the next person wear all the stuff grabbed so far?)
   • The object is for the last person to be wearing the backpack and all of its contents at the end of the relay.
6. **Some Simple Rules:**
   • The first person out MUST grab the backpack.
   • ONLY one item at a time can be grabbed.
   • All items that can be worn MUST be worn (clothing, binoculars).
   • All items that cannot be worn MUST be put in the backpack SECURELY.

Let’s see who gets to go on their expedition first!

Wrap Up (For coordinator to communicate to students)

In the next few after-school adventures students will be introduced to new researchers and local projects they can do to help as a team. They will find out what the “researcher of the month” works on, what animals they study, and do lots of fun activities so they can discover what it takes to help save animals and their habitats. They will work on crafts, dramas, and science experiments, and perhaps go on some field trips.
Researcher’s Riddle
At the end of each meeting, a Researcher’s Riddle will be presented that highlights the next meeting’s topic. Next time, students will meet a CRES researcher from Argentina who studies owl monkeys. The nocturnal owl monkeys live in pairs for life; in other words they just have one mate. They do not choose their mates based on looks, but something else. How can researchers use this information to study the monkeys and their habitat?

It’s dark when looking for a date,
That is the owl monkey’s fate.
How else, but sight to choose a mate?
Well, they have found a way that’s great!

We look forward to hearing your answers at the next meeting... ...

Field Trip Extension
Students can participate in one of two field backpack programs developed by the Zoological Society of San Diego. At the Wild Animal Park call the Education Department at 760-738-5057 to learn more about the Safari Backpacks program. The Chula Vista Nature Center offers the Sweetwater Safari program, which explores a wetlands habitat. Call 619-409-5903 for more information.
MODULE 1-A

EXPLORING THE GRAN CHACO HABITAT AND OWL MONKEYS

Researcher: Eduardo Fernandez-Duque
Country: Argentina, South America

Overview
Students will learn about a researcher who works in northern Argentina studying owl monkeys. Activities will include a dramatization and outdoor game.

Introduction
Dr. Eduardo Fernandez-Duque works in the province of Formosa, located in the northeastern region of Argentina. Seven to eight thousand years ago, the first people to live in Formosa were the Toba, the Pilagá, and the Wichi Indians. Today, there are four different kinds of people living in Formosa: the three Indian groups just mentioned, and the “criollos,” people descended from the Spanish who came to South America during the 16th century.

Some of the criollos live in a city and never ride a horse or go to the forest. But some of the criollos are called “gauchos.” Most gauchos work and live on cattle ranches. These people spend every single day riding a horse, sometimes from dawn to dusk. The horse is very important, since it helps them manage the cattle.

Many of the Indians of Formosa also live in the city. They are bilingual; they speak their own language at home and Spanish at school. Indian families of Formosa have not adopted many of the criollos’ customs, and still live close to the forest where they hunt, fish, and collect fruits to eat. They do not hunt or fish for fun, like some people do in the United States or other developed countries. The Indians rely on the forest to survive. One of their favorite food items is honey. Since there are many different types of bees in the area, there are many types of honey: some very sweet, some very watery. Toba and Pilagá women make beautiful baskets with dry palm leaves. W ichi women make useful string bags with fibers from a forest plant. W hen they go to the forest to collect “algarroba” fruits, they carry the string bags on their backs, hanging them from their foreheads.

The Gran Chaco, an alluvial plain covering an area the size of Poland, consists of a mosaic of grasslands, savannas, drought-tolerant thorn forests, and narrow bands of forests along streams. The region shows significant seasonal variation in climate, rainfall, and food availability. This is the habitat that the people and wildlife of Formosa share.

Within the dry forest of the Argentinean Chaco, Dr. Eduardo Fernandez-Duque studies the genetics of mate choice by owl monkeys, one of the few monogamous primate species in the world. Owl monkeys are nocturnal and make extensive use of chemical communication, but it’s unknown what role chemical cues play in reproductive decisions. This species of monkey also lives in family groups of three to seven individuals in small home ranges.
Dr. Fernandez-Duque’s mission is to conduct radio-tracking studies of behavioral ecology, coupled with genetic studies of paternity and the immune system in wild owl monkeys. He is also involved in efforts to set up a 5,000 hectare (19 square-mile) wildlife reserve at his field site, and wishes to organize an outreach program with the ZSSD’s Education Department.

**Before Activity**
Discuss with students their answers to the researcher’s riddle. (Answer: Researchers are still learning how owl monkeys choose their mate. They have some data that seems to show the monkeys use sound and smell, but they are not completely sure.)

**Activity Suggestions**
- Read the first paragraph of the biography and then ask for volunteers to help read individual paragraphs.
- Expand on the “What do you love?” question. Have the students share the things they know and love.
My name is Eduardo Fernandez-Duque and I’m a researcher for the Zoological Society of San Diego. I work in Argentina studying owl monkeys. These monkeys are unusual because they are active at night. Most monkeys are awake during the daytime, like us.

People sometimes want to know why I started studying animals. When I was young, two of my favorite television programs were Daktari and Animal World. Daktari was a veterinarian. He lived in Africa and took care of wild animals. He had some unusual friends, too. One of his friends was a cross-eyed lion named Clarence. Another animal friend was Judy, a chimpanzee. Animal World was mostly about the big grazing animals of the African savannah. Twenty years ago we did not know very much about animals that live in trees, such as monkeys.

As I grew older, my adventures with wild animals became much more exciting. When I was 10 years old, I went to a zoo in Argentina. It had an animal show where one of the children in the audience was picked to walk into the tigers’ enclosure, pick up a tiger cub, and bring it to the tiger mom. Guess who was picked to do that? Yes, they chose me!

I decided to study animals, so I went to college at the University of Buenos Aires in Argentina. The first animals I studied were crabs. I wanted to know how crabs learn and how they respond to danger. After that, I went to school at the University of California at Davis. This is where I started studying monkey behavior. I’ve had some pretty wild things happen to me during my research in the field.

Sometimes people ask me if my work really helps the world around us. I think it does. “We only love what we know,” is a popular saying. Think about it for a moment. What are the things you love? What are the things you care about? It is ALWAYS things you know very well.

The problem is that most children in Argentina do not know about the wonderful forest they have in their own backyard. Owl monkeys are not endangered, but the forest where they live is. I believe that people will not help conserve the forest until they know more about it. Through my work I have been able to show the forests to many students in Argentina. I want to make sure that every child in Formosa, Argentina gets out into the forest. If they love it, then we have a better chance of saving it.

**What You Can Do to Help Eduardo**

1. **Butterfly Farming or Ranching:** Students in Formosa, Argentina would love to learn how to help the habitat of the owl monkey. One way they can help is by raising pollinators, such as butterflies. You can help the animals in your area by raising butterflies too, and sharing your information with students in Formosa.

2. **Trash and Recycling:** We must stop being wasteful. Here’s an idea: go through your school and make a list of items that could be reused. Paper is a good example. If it’s only got printing on one side, the clean side could be used again! Think about the paper your school uses. Reusing paper could save your school some money and save some trees too!
Activity: Night of a Hundred Peccaries!

Overview
Through a dramatization, students will relive one of Eduardo’s most adventurous moments in the field.

Character Roles
• Eduardo
• Research Assistant (choose a female, if possible)
• Voice of Eduardo
• Peccaries (as many as you want!)

Sound Effects Roles
• Spooky sounds, like an owl hooting
• Creepy screams or thunder claps. Encourage creativity!
• Sound of the flashlight dying

Materials
• Flashlight
• Hiking boots
• Clipboards— for Eduardo and the research assistant
• Pens
• Backpack
• Pretend loud speaker— for voice of Eduardo
• Feathers— for owls
• Script (10 copies)

Procedure
1. Assign students a character or sound effect role.
2. The characters of Eduardo and the research assistant can carry and use the items out of the backpack.
3. “Voice of Eduardo” reads the script. Allow a few moments for each of the actions in italics to be acted by the students.
4. You will need to dim the room if possible.

Activity Suggestions
• After reading the story, add your own “props” to enhance the tale and interest your students.
• Indicate to each group of students how long each action should occur. This will help the “Voice of Eduardo” highlight the story and allow time for the actions to take place.
E: I had just started working with owl monkeys and my research assistant and I were coming back to camp at night.

(Eduardo and research assistant walk around in the dim room.)

E: Although I had my flashlight, it was quite dark and kind of spooky.

(Students make spooky noises.)

E: As we approached camp, we heard some very loud noises between us and our tents.

(Students who are peccaries make some loud noises.)

E: There are no big cats like jaguars or tigers in our forest, but there are white-lipped peccaries. Peccaries are like big pigs with huge tusks. When they walk around in the forest they stay in groups of up to 100 animals.

(Have students make finger tusks and pig-like noises.)

E: Trust me—you do not want to find yourself in the middle of 100 white-lipped peccaries running wild. They can be very dangerous!

Since we thought the noises could be the peccaries, we decided to wait in the dark until they had left camp. And then my flashlight died! Yes, it went dead without any warning at all.

(Have a student dramatically create the sound of a flashlight dying!)

E: I thought the batteries were dead, so I put in some new ones, but no luck. No flashlight, no moonlight, but lots of wild peccaries a few yards away. We climbed up the nearest tree and I told my assistant to make sure she would not leave without me.

(Have Eduardo and research assistant climb up on a chair or desk to escape the peccaries.)

E: After a while, the noises stopped and we decided it was safe to go back to camp.

(The students who are the peccaries wander off to the far side of the room. When they are quiet, Eduardo and the research assistant can climb down.)

E: Since then, I always bring a spare flashlight with me!
Activity: You Smell Good!

Overview
Students can pretend to be owl monkeys!

Introduction
Owl monkeys are thought to be monogamous, which means they only have one mate at a time. This relationship is similar to being married. Researchers are not sure how the monkeys choose their mate, but they think it has something to do with smell, not looks. Remember that owl monkeys are nocturnal, so it would not make much sense for them to have brightly colored fur as a way to tell each other apart.

Materials
• Scented oils or scented markers*
• Index cards (all the same color)
• String
• Hole punch
* If scented markers are used, students will need to be blind folded or the room darkened, so they are unable to identify the marker color.

Preparation
1. Punch a hole in two corners of each card and thread the string through the holes so that each index card can be worn like a necklace.
2. On the back of each pair of cards, write a number on one card and a symbol on the other. Small printing in the lower corners works well.
3. Create a code chart to match up pairs of cards.
4. Put a different scent on each pair of cards.

Procedure
1. Dim the lights and distribute a card necklace to each student.
2. Tell them they are owl monkeys and have to find another owl monkey with the same smell that is on their card by using only their noses! (Some students may be allergic to certain smells and oils. Advise students not to touch the oily spots on the card, just smell them.)
3. Once they find their match, have them sit together until all the monkeys are paired up.
4. Discuss what role scent plays in the lives of nocturnal animals.

Wrap Up (For coordinators to communicate to students)

Researcher’s Riddle

What crafts, field equipment, or art can you make from stuff thrown away in the trash?