

# BIODIVERSITY OF THE CALIFORNIAS



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# BIODIVERSITY OF THE CALIFORNIAS

GRADES 3-6

## DESCRIPTION

**S**an Diego County is rich in biodiversity. The climate and varied landforms create a number of distinct habitats, including **a) coastal sage scrub and chaparral, b) desert, c) coast, d) Torrey pines, e) streamsides, and f) woodlands and forest.** Scientists describe our region as a conservation "hotspot" in need of immediate preservation because of the vast numbers and variety of threatened and endangered plant and animal species that reside here. Our everyday actions can have an impact—negative or positive—on the health of San Diego's ecosystems.

## GOALS

**To teach students about habitat diversity**

**To provide students with daily action steps that can have a positive impact on San Diego's biodiversity**

**To call young leaders to action**

**To inspire students to conserve local biodiversity**

## STANDARDS

- Students know examples of diverse life forms in different environments, such as oceans, deserts, tundra, forests, grasslands, and wetlands.
- Students know living things cause changes in the environment in which they live: some of these changes are detrimental to the organism or other organisms, and some are beneficial.
- Students know when the environment changes, some plants and animals survive and reproduce; others die or move to new locations.
- Students know that in any particular environment, some kinds of plants and animals survive well, some survive less well, and some cannot survive at all.
- Students know many plants depend on animals for pollination and seed dispersal, and animals depend on plants for food and shelter.
- Students know that the amount of fresh water located in rivers, lakes, under-ground sources, and glaciers is limited and that its availability can be extended by recycling and decreasing the use of water.
- Students know populations of organisms can be categorized by the functions they serve in an ecosystem.
- Students know different kinds of organisms may play similar ecological roles in similar biomes.
- Students know the number and types of organisms an ecosystem can support depends on the resources available and on abiotic factors, such as quantities of light and water, a range of temperatures, and soil composition.

## VOCABULARY LIST

**Threatened species**—a species that exists in low numbers

**Endangered species**—a species that is in danger of extinction

**Conservation**—the wise use of resources

**Biodiversity or "biological diversity"**—the variety of plants, animals, and other living things in a particular area or region

**Habitat**—an area in which an animal or plant finds food, water, shelter, and space

**Fragmentation**—when a large habitat is divided into smaller individual areas, usually by urban development

**Adaptation**—a quality an animal/plant possesses or a behavior it performs that helps it to survive

**Ecological community**—the collection of species found in a specific locality

## BACKGROUND

See accompanying Zoological Society of San Diego guidebook San Diego's Habitats

## ACTIVITIES

### 1. WHO IS THIS?

- a) Divide the class into two equal teams.
- b) Explain that each team will make a game for the other. The object of the game will be to match animals to the environment in which they live.
- c) Divide each half of the class into six groups, and assign each group a habitat (coastal sage scrub/chaparral, desert, coast, Torrey pines, streamsides, and woodlands/forest).
- d) Using the internet and other resources, have each group research its assigned habitat, learning its characteristic life forms including adaptations of the animals and plants that enable them to survive in that environment.
- e) Ask each student group to make a poster showing the characteristic vegetation, landforms, etc. in the habitat the students are studying.
- f) For each habitat, students should make five cards, one each for five species of animals or plants that are characteristic of the habitat. Have the students put a description of the adaptations of the animals/plants on one side of the card, and a coding number on the other side, so that the animal/plant described can be identified later. (Do not write the name of the animal/plant on the card.) The cards should describe adaptations that enable the animals/plants to survive in the habitat. E.g., for the desert habitat, one of the cards could read: "Hunts at night for warm rodents and sleeping birds; can climb loose, sloping sand by throwing loops of its body up like coils." (sidewinder rattlesnake)
- g) When posters are made and cards completed, students in each half of the class should make a master list of the six habitats and animals/plants their cards represent.
- h) Each half of the class then exchanges posters and cards with the other half.
- i) Each half of the class tries as a group to decide which habitat each card belongs to.
- j) Give half of the class the master list for their posters. One student per group can read off the animals/plants that correspond with each card for each poster.
  - Has each animal been placed in its proper habitat? If not, why?
  - Were there any animals found in more than one habitat? Are these habitats varied?
  - How can some animals live in more than one habitat, and not others?
  - What are similarities and differences among the ecosystems and animals/plants?
  - What functions do the adaptations serve?
  - Have students look for rare, threatened, and endangered species in each habitat. Are there any? If not, why not? If yes, why?

## 2. OFF-SITE HABITAT RESTORATION PROJECTS

San Diego parks, reserves, conservancies, and environmental organizations sponsor a wide variety of opportunities to help maintain and restore coastal sage scrub and other habitats.

- a) Trails, fencing, and signs are maintained to keep hikers from wandering into sensitive habitat areas.
- b) Non-native plants and undergrowth are cleared to keep native plants healthy.
- c) Trash is cleared to maintain safety and beauty.
- d) Native plants are planted to help restore natural habitat.

Groups can participate in one-day clean ups or ongoing restoration projects. Call a reserve near your school to inquire about opportunities, then work with the rangers to have your class participate in programs already in place or to develop an age-appropriate project that allows your class to work independently.

## 3. HOW MUCH HABITAT IS LEFT?

- a) Using a tape measure, have students measure the length and width of the classroom to determine the area.
- b) Help them determine what constitutes 10% of the room's area.
- c) Cut string the length of 10% of the room's area.
- d) Ask students to list as many animals and plants as possible that would be found in a streamside (riparian) habitat. (This activity can also be done with animals/plants in a coastal sage scrub habitat.)
- e) Ask the students to imagine that all of San Diego's riparian areas are within the classroom, and that the students are the animals and plants they've just listed.
- f) Tape down the piece of string into the shape of a square and have all the students now stand inside it.
- g) Tell them they are now standing inside 10% of the total riparian habitat, the same percentage of riparian habitat that is remaining in reality. What is it like inside the square? How does this affect the animals and plants that live there? Can they all find enough food, shelter, and water? Will they all survive?
- h) Now cut the string in half and make two individual squares several feet apart.
- i) Have the students choose a square to stand in. Tell them they cannot move between the squares because there is a city in between them.
- j) Give each "animal" or "plant" a handful of candy or other item. Tell them this is their food/nesting site/etc. What if all the "food (nesting sites, etc.)" in one of the habitat fragments disappears? How might this happen? Does it ever happen in nature?
- k) Take away what's left of the "food (nesting sites, etc.)" in one of the habitat fragments. What are the animals/plants of that habitat fragment going to do? How will this affect them? How does it affect the habitat?

## 4. CRAFT: REUSABLE SHOPPING BAGS SAVE HABITATS

**For this craft project, you'll need a cloth or canvas bag (recycled cotton bags are perfect) for each student.**

- a)** Introduce the project to students with the following: "Paper or plastic?" We hear that question every time we go to the grocery store. But which bag is better for the environment? Paper bags are made from trees that are cut down. New trees can be planted to take their place, but this takes time. Plastic bags are not made from trees; they're made from oil. Oil is not something we can replant; once oil is used up, it can't be replaced. Both paper and plastic bags can be used for other things after bringing home groceries. They can also be recycled. What happens to the rest of the bags? They get thrown away, to be buried in a large landfill. As we know, many landfills are on land where wild animals lived. A reusable grocery bag is made of canvas or cloth, and can be used over and over again, making a big difference in saving animal habitat."
- b)** Show the students a completed bag so they understand what they'll be making. Students will be decorating their bags with illustrations of a local habitat, animal, or plant they've studied.
- c)** Have students sketch ideas on scratch paper.
- d)** Students can use pencils to draw their designs on the canvas bag. Use fabric pens or paint to color in the drawing.

## 5. OUTDOOR MINI-HABITAT STUDY

**For this activity, choose a suitable area around your schoolyard or in a nearby park to explore.**

- a)** Ask students to measure a square area of ground one meter on each side. Push four sticks into the ground to mark the four corners of the square. Tie string around the sticks to enclose the area (or use hula hoops or string circles to mark the area).
- b)** Have students study the area closely for several minutes. Ask them to look for moving insects or other miniature wildlife.
- c)** Make a list of all the kinds of animals and plants discovered within the mini-habitat. Students should use a hand lens to help them see small plants and animals. How many kinds of animals and plants were found? Does the temperature or moisture differ in various sections of the mini-habitat? Why or why not?
- d)** Have students use a small shovel to collect a sample of the soil, then pour the soil samples onto a sheet of white paper. Have them examine the sample with a hand lens while looking for living things.
  - What living things can they identify?
  - What populations were found in the habitat? In what ways might these populations affect each other?
  - Suppose this same area were studied at another time of the year; how might this affect the number and kinds of populations found?
  - How would students describe their mini-habitats? How are they similar to or different from the six habitats they've studied?

## RESOURCES

- San Diego's Habitats booklet, Zoological Society of San Diego
- Conservation Outpost @ [www.sandiegozoo.org](http://www.sandiegozoo.org)
- Biodiversity trading cards, Zoological Society of San Diego
- Project WILD Activity Guides (Elementary, Secondary)
- Adopt-A-Habitat Educator's Guide, Zoological Society of San Diego
- Wildlife Wizards, Zoological Society of San Diego
- State Park Field Trips Tips and Activities – Wisconsin Department of Natural Resources
- Balboa Park/Florida Canyon (619) 239-0512
- Blue Sky Ecological Reserve (619) 486-7238
- San Diego County Department of Parks and Recreation (619) 475-1633
- Mission Trails Regional Park (619) 668-3275
- San Elijo Lagoon Ecological Preserve (760) 436-3944
- Torrey Pines State Reserve (858) 755-2063