CALIFORNIA STATE PARKS · 2016

# Summer Learning Program Activities





California State Parks
Interpretation and Education Division

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California State Parks
Interpretation and Education Division
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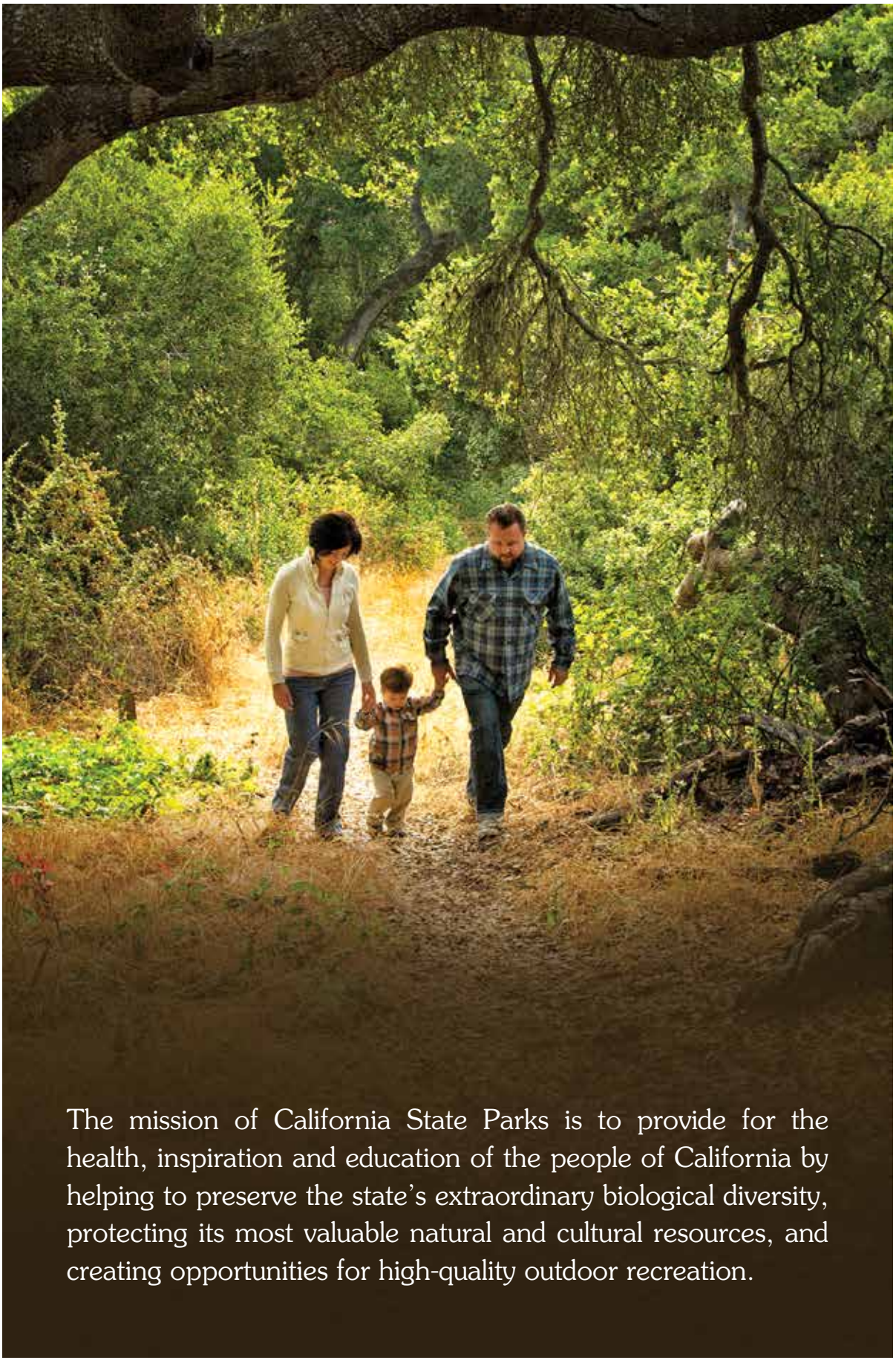

The mission of California State Parks is to provide for the health, inspiration and education of the people of California by helping to preserve the state's extraordinary biological diversity, protecting its most valuable natural and cultural resources, and creating opportunities for high-quality outdoor recreation.

# SUMMER LEARNING PROGRAM ACTIVITIES

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# INTRODUCTION

## The Importance of Learning Out of Doors

The positive benefits gained by a child learning in the outdoors can't be duplicated. Under a dome of sky while breathing clean air, the child receives the gifts of discovery, amazement, and wonder. Many of us intuitively know that a child grows stronger and more resilient in these environs; today, scientific research confirms it.

These out-of-doors treasures are catalysts which give distinct advantages to children. Documented evidence proves that experiences of safely being outside and engaged in directed experiential learning improves children's physical and psychological well-being, inter- and intrapersonal skills, and cognitive functioning.

Additionally, the experience of learning outside leads to understanding the natural world while forming a personal and deeply felt relationship with nature. When students have opportunities to learn about and investigate the natural environment, they can make intelligent, informed decisions about how to take care of it. The relationship cultivates environmental literacy and ultimately leads to stewardship of our fragile world.

California State Parks offers a magical and welcoming gateway into the possibility and promise of the benefits available to children who are able to discover the natural world.

## About This Compilation

Park program staff working with the Summer Learning Programs (SLP) over the years have developed a variety of park- and nature-related games to use with the students coming to their parks. This document is a compilation of many of these activities. Most can be used in a variety of parks with only minor adjustments. Some of the activities can be used as a template, should they need modification for use in a different environment. Each activity also suits a fairly broad age-range of students.

This compilation has been put together as a resource for park staff and school teachers working with students coming to a park. Quite a few activities can be used in a classroom setting by teachers or parks staff as introductory lessons before the students visit a park on a field trip.

The activities have been adjusted to be general rather than park-specific. Some of the activities are for certain type of habitat (such as coastal/beach), but they may be modified for use in a different environment.

For each activity, we have noted the goal/subject of the activity, the appropriate age range, the approximate time needed to do the activity (not including the prep time), materials needed, and whether it is an indoor or outdoor activity.

## Practicing Park-Friendly Behavior

We welcome you and your group to one of our great California state parks, premier destinations for recreation. We are here to help you teach your students about our ecosystem and how to protect and preserve this valuable natural resource. Biologists and naturalists often report that we are "loving our native environment and wilderness to death."

We have established a few suggestions and rules that will help you safely enjoy your field trip while reducing your impact on the natural environment. We appreciate your cooperation in carefully reviewing these rules with your entire group before the day of the scheduled program.

1. Remember that the park is not just a destination; it is also a home. Share the park with the birds and animals you find here and know that you are their guest.

2. Walk slowly and carefully on the bike path or trail. Watch out for bicyclists when you are crossing the path, and make sure to share the trail. Accidents may happen when pedestrians are not paying attention.

3. To avoid injury, always wear shoes with a firm sole, even if they get wet. We will be participating in some physical activity games, so close-toed shoes are preferred over sandals.

4. Please do not feed the wild animals because they will become dependent on human foods and human contact. They will lose their natural ability to forage in the wild and may develop hazardous behavior towards humans and other animals.

5. After enjoying your lunch, make sure all food, crumbs, and waste items are removed. Proper waste bins will be provided. Human food products and trash are detrimental to the health and habits of wild animals and birds.

## SAMPLE FIELD TRIP LOGISTICS

### What to Bring:

#### Leaders:

1. Group Reservation Request Form
2. Park map
3. First aid kit
4. Drinking water
5. Name tags

#### Students:

1. Appropriate footwear that protect the feet
2. Layered clothing (sweater/ sweatshirt)
3. Hat
4. Sunscreen
5. Drinking water
6. Lunch – if applicable.

# ACTIVITIES

## JAYS AND JUNCOS GAME

**Subject/goal:** Animal families and adaptations to their environment
**Grades:** K – 8th
**Time needed:** 45 minutes
**Environment/Habitat:** Area with bushes and other plants
Materials: Bag of beans, yogurt cups or film canisters (1 per student, about 5 marked with blue painter's tape), pictures of jays and juncos

### Activity:

Take the students to an outdoor area, preferably with bushes or plants to serve as small hiding places. Explain that the students will be playing the parts of two different birds—jays and juncos (you may show the students a picture of each bird). Each bird will be trying to collect enough food to feed the babies in its nest. The birds do this in different ways, however: the juncos hide their nest and deliver food to it, while the jays steal food from the nests of the juncos. These birds actually do this in the wild!

Tell students that they will be given a yogurt container or "nest." Most will be juncos and will hide their nests somewhere in the area. (Juncos may NOT carry nests around during the game.) The junco students will hide their nests, then collect beans one at a time from the instructor to be delivered back to the nests. For the first round, just one student will be a jay with a special blue nest. This jay student will carry the nest with her/him and steal beans out of junco nests. In order for a bird's babies to survive, the parent bird must collect 5 or more beans. Each round should last about 7 minutes. After 7 minutes, call the students and ask whose babies survived this year. Who has more than 5 beans? Play several rounds, adding more and more jays. At the end, try a round with a large number of jays to see what happens.

Post discussion: What were ways that students kept their nest from being discovered? Did they keep their homes hidden? Did they hide their nests close to the food source? Does this explain why real animal homes can be so hard to find? When students go to their local park, where are some places they would they expect to find animal homes?

## ALL IN THE FAMILY

**Subject/goal:** Understanding animal families and classification
**Grades:** 4th and up
**Time needed:** 45 minutes
**Environment/Habitat:** Any classroom or outdoor space
**Materials:** Sets of animal pictures from different orders in the animal kingdom; fact sheets about the different Orders.

### Activity:

Tell students that different types of animals have a lot in common. For example, a snail and a slug are very similar because they both slide around on slime and have gooey bodies, so they come from the same group of animals. A wolf and a fox also come from the same animal order because they both hunt for meat and look similar. Belonging to the same group of animals means that they are more closely related to each other than they are to other animals.

The students are going to be given 9 pictures of animals from 4 different groups or "orders." These animals are in the same order because they have something in common. Divide students into 4 groups and give each group a set of pictures. Have students figure out which animals are most closely related and put those pictures together. When the students are done, have a couple groups share some of their answers. Which animals did they think were related? Why? Then give them the answers. You could write 4 categories on the board as follows: RODENTS (Animals with "buck teeth"): mouse, squirrel, beaver UNGULATES (Animals with hooves): deer, cow, pig MARSUPIALS (Animals with a pouch to store their young): kangaroo, koala, opossum CARNIVORES (Animals that hunt for meat): raccoon, mountain lion, wolf Next, assign each group a single animal order and have students briefly research what the members of that group have in common. Have each group do a short (1-2 minute) report about their animal group and its members. Their report could be a few facts about that order, followed by the classmates guessing which order the group is describing.

## FAMILIES IN NATURE

**Subject/Goal:** Animals
**Grades:** 4th – 8th
**Time needed:** 45 minutes, can be ongoing
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Colored pencils/markers, animal books for research, paper

### Activity:

Assign students different animals and have students independently research the following questions: How many offspring does the animal bear at any given time? How long do the young animals stay with their parents? Does your animal pick mates for life?

Do several families live together, or do the animals like to be alone or with small groups? Have students color a small poster with a drawing of the animal and babies in its habitat, with the answers to these questions on the poster.

## TRACK STORYBOARDS

**Subject/Goal:** Animal tracks
**Grades:** 4th – 8th
**Time needed:** 60 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Animal track stencils, colored pens, large white pieces of paper (large Post-its with sticky back)

### Activity:

Divide students into groups of 3-5. Each group gets a large piece of white paper representing a part of a trail or park, colored pens, and a few different track stencils. Using as many signs and clues as possible, students create a "story" (no words allowed), using the different animal-track stencils in front of them, and try to stump their instructors. Have students think about why their animal's there, what they are doing, where they are going, if they are following/chasing another animal, etc.

When students are finished, instructors will have to use their own tracking skills to figure out what the animals on the paper were doing.

## LEARNING GAIT

**Subject/Goal:** Animal gait
**Grades:** K – 8th
**Time needed:** 25 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Blue and red construction paper cut into circles, with foam backing to hold in place.

### Activity:

Instructor uses colored circles to represent the front (red) and hind (blue) paws of animals. By placing the circles on the ground to replicate the gaits of different animals, students can try for themselves to walk like that animal, placing hands and feet on the appropriate colors. Younger kids have the option to play "Red Light, Green Light" using animal gaits. The instructor ("prey") stands on one side of the room with back to everyone. Students stand in a line on the other side of the room (if outside, line up opposite the instructor). Instructor calls out a predator type, and the students have to walk like that predator toward the instructor. Students can move forward freely until

instructor turns around to face them, then everyone must freeze in place. Students that move must go back to the line. Students who are able to tag the instructor without being caught become "prey" as well, and they turn around when the instructor turns.

## FIND A STATE PARK!

**Subject/Goal:** Maps and Exploration
**Grades:** 4th – 8th
**Time needed:** 30 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Map of California State Parks and vacation guide, if available

### Activity:

Have each student pick a park on the provided maps. Have students explore maps and decide what they could do if they visited that park. Teach students how to read icons and go over any rules and regulations.

## I WORK AT A STATE PARK

**Subject/goal:** Wilderness parks are fun!
**Grades:** K-8
**Time needed:** 15-20 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** None

### Activity:

With students standing at least an arm's length apart, tell them that you are going to describe your job. Prompt them to repeat after you, and make an iconic movement to go with each statement:

- I work at a state park (point to arm patch)
- My name is Ranger __interpreter's name__ (point to nametag).
- Repeat the above, only tell the students that instead of putting your (interpreter's) name, they are to put their (student's) name: My name is Ranger __students insert their names__ (point to nametag).
- Continue having students repeat after you. Describe a local park, what people can do at the park, jobs at the park, etc:

- Where I work, there are mountains (put fingertips together, above eye height), trees (lift arms above the head), and rivers (move hands like a river).
- At my park (point to self), people like to look for animals (make "binoculars"). There are rabbits (bend index and middle fingers like bunny ears), squirrels (make "chewing" motions with fingers in front of mouth), birds, (point up at the sky), deer (put hands above head like deer antlers), and sometimes snakes (make slithery snake motion).
- At my park (point to self), people like to hike (move fingers like two legs), swim (making swimming motions), and go camping (make a tent shape putting fingertips and thumbs together).
- When I grow up (points to self), I'm going to work at a state park!

Additional helpful tips: These hand motions are impromptu, but specific sign language signs may be substituted if preferred.

## SURVIVOR

**Subject/Goal:** Understand survival needs of animals
**Grades:** 4th – 8th
**Time needed:** 30 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Colored paper (red, green, blue, brown)

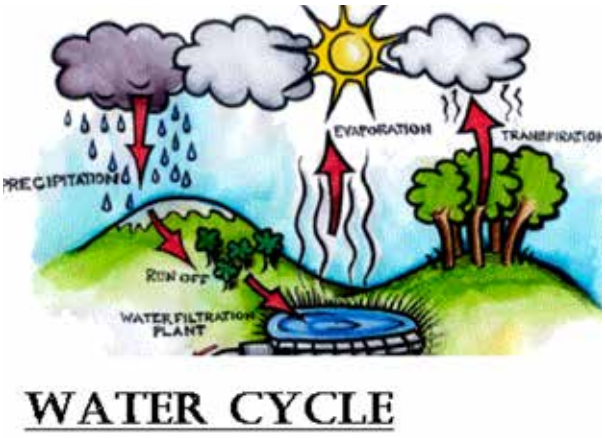
### Activity:

This game will help students to understand how insects/organisms are impacted by factors essential to an organism's survival in a particular habitat. They will understand how lacking just one element of their habitat (food, water, shelter, space) can affect the organism's chances of survival. Ask the students to imagine themselves as insects. In order to survive they must collect food, find water, and find shelter in a place with enough space to live. Distribute different colored strips of paper around the classroom. The codes are:

**red – shelter, green – food, blue – water, and brown – space.**

In order to survive the activity, each student must collect 1 red strip, 3 green strips, 2 blue strips, and 1 brown strip within 30 seconds. After all the strips have been collected, see which students have collected the correct number of each color. Those who haven't would be the first insects to die.

## WATER CYCLE RELAY




**Subject/Goal:** Water cycle
**Grades:** K – 8th
**Time needed:** 30 minutes
**Habitat/Environment:** Any outdoor space
**Materials:** 4 clear plastic containers (big enough to fit a gallon of water), 2 sponges, pictures of the water cycle steps

### Activity:

Using the water cycle pictures, teach/teach the steps of the water cycle (point to picture and have the students repeat the words after you): What is it called when water rises up into the air as steam? (evaporation) What is it called when water turns into a cloud? (condensation) What is it called when water falls from a cloud as rain or snow? (precipitation) Now tell the students that they are about race in teams to help water travel around the world in the water cycle. Fill 2 containers with water and place them at one end of field. Put an empty container on other side. Children split into 2 teams and line up at their team's full container. Students absorb water with a sponge (evaporation), then run across the field with the wet sponge (condensation), and squeeze it out (precipitation) into the empty container. They then run back to their team with the empty sponge and pass it off to the next runner. The first team to fill their empty container up to the line wins.

## WATER CYCLE BRACELETS

**Subject/goal:** Water cycle
**Grades:** K-3
**Time needed:** 15 - 30 minutes
**Habitat/environment:** Any classroom or outdoor space with a table
**Materials:** Plastic beads, elastic cord, pictures of each step of the water cycle.

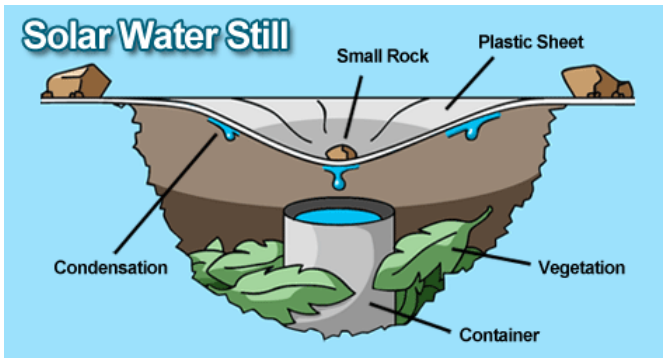
### Activity:

Teach/review the steps of the water cycle (point to picture and have the students repeat the words after you): What is it called when water rises up into the air as steam? (evaporation) What is it called when water turns into a cloud? (condensation) What is it called when water falls from a cloud as rain or snow? (precipitation) Each child makes a water cycle bracelet, using string and the following colors of beads to represent the water cycle: dark blue (ocean), yellow (sun), clear (evaporation), white (condensation), light blue (precipitation), brown (groundwater), turquoise (rivers and streams). Containers of beads are set out in a circle with pictures representing the water cycle. Students become water molecules, stop at each station to collect a bead, string the beads in order onto the elastic cord, and tie off the cord when completed.

## BUILD A SOLAR STILL

**Subject/Goal:** Water distillation
**Grades:** 4th – 8th
**Time needed:** 45 minutes on 2 consecutive days
**Habitat/Environment:** Any outdoor space Materials: Picture of the water cycle, clear tubs, cling wrap, powdered drink mix or food coloring, small bowls, rubber bands, water (tap water is fine)

### Activity:




Begin by telling students that they are about to use the steps of the water cycle to make a machine to purify water. Emphasize that this could save their lives someday if they ever get into a situation where there is no clean drinking water. To get ready to build the machine, review the steps of the water cycle using the visual. Ask students if water travels all around the world. If it gets plopped into the ocean, how does it ever leave? Divide students into groups of 4 or 5. Tell them they have all crash-landed on a desert island and all they have to drink is extremely dirty, salty water. All they have with them is a large can, some plastic wrap, a rubber band, and a mug. Pour dirty, food-colored water into their tubs (only about 1 inch of water deep) and give them 5 minutes with their groups to experiment with different designs. Tell them that after 5 minutes, the groups will come together to discuss ideas and come up with a final design. After 5 minutes, call the students together and ask if anyone has an idea they think might work. If one group has come up with the "right" design, take the class over to look at it and discuss how it will use evaporation, condensation, and precipitation to make the water clean. If no group has the right design, use the materials to ask brainstorming questions:

When the dirty water evaporates, will the water in the air still be dirty/have salt in it? **(No)**

What are some ways that we could trap the evaporating water? **(With plastic wrap)**

Once we trap it with the plastic wrap, how do we make sure it doesn't just drip back into the dirty water? **(Put the bowl in the middle of the tub.)**

How can we make sure the water drips into the bowl? **(Dent in the plastic wrap over the bowl without piercing the wrap.)**

Finish by letting all the groups make a final design of their machine and leave it IN THE SUN until the next day—when they can check their bowls for clean water!

## WHICH HOME IS MINE?

**Subject/goal:** Animal homes
**Grades:** K - 3
**Time needed:** 30-60 minutes
**Environment/Habitat:** Any classroom or outdoor space
**Materials:** Pictures of animals and their homes.

### Activity:

Several students line up in front of the class holding pictures of different animal homes (nests, dens, under a rock, etc.). One by one, other students are called to the front and given a picture of an animal. They must bring their animal pictures to the right home. If they are correct, the child with the "home picture" says, "Welcome home!" If they are wrong, the home students say, "Try again." When the animal arrives at the proper home, the instructor can ask the student bringing the picture, "Why is this a good home for this animal?"

Discuss: What things do all animals need to be able to find near their home (food, water, etc.)? How else might a home be useful to an animal? Does it protect them from anything (cold, extreme heat, predators)?

## MEET A TREE

**Subject/Goal:** Nature observation
**Grades:** K – 3rd
**Time needed:** 30 – 60 minutes

**Habitat/Environment:** Any place where trees can be accessed Materials: Blindfolds (optional), an outdoor area with plants and/or trees

### Activity:

Divide the students into teams of two. Have one member of each pair put on a blindfold (if you don't have blindfolds, closing eyes is fine). Instruct the non-blindfolded students to lead their "blind" partners to any tree or plant (except grass—unless grass is in an area that makes it unique) within the designated boundaries. The "blind" student must learn as much as they can about their tree/plant by touching it gently, smelling it, and hugging it. S/he is then led back to the group by the partner (using an indirect route to make it more difficult) before their blindfold is removed. They must now find the trees/plants they have just visited. Partners then switch roles and repeat. NOTE: It can be helpful to explain this activity by grabbing a volunteer and modeling the whole process in front of the students before setting them loose.

## ADAPTATION SHOW AND TELL

**Subject/Goal:** Animal adaptations
**Grades:** K - 3
**Time needed:** 15-30 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Animal parts for display (furs, teeth, antlers, feathers, etc.), big pieces of paper for drawing (if not available, individual paper is fine), colored pencils or markers

### Activity:

Discuss fact that many animals have to be like Olympic athletes to stay alive in the wild. Some have special body parts that help them survive, like wings or body armor that protects them. Others are not strong, but they are smart—they use clever strategies to stay alive, such as "playing dead" when they are attacked or hibernating to avoid cold weather. One by one, bring out animal parts (feathers, antlers, sharp teeth, fur, etc.) and discuss how each one would help the animal survive in their local park. Ask students questions such as "How would this antler help an animal survive?" and "What kind of animal has a sharp antler like this?"

## CREATE A CRITTER

**Subject/goal:** Animal adaptation
**Grades:** K-3
**Time needed:** 30 minutes
**Habitat/Environment:** Any classroom or outdoor space with tables
**Materials:** big sheets of paper, colored pens or crayons

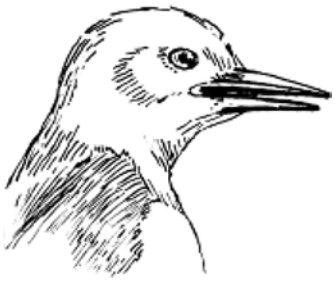
### Activity:

Tell students that they are now about to create their own animals, with any special features or parts that they want. This animal should be one that does not exist in real life. This animal can be a flying whale that can live in water or in the air; it can be a lion that can spray water out of its mouth and has a spiky ball on its tail for defense. It can be anything! Lay out pieces of big paper on each table. Write the name of a habitat at the top of the paper (rain forest, ocean, desert, snow, mountaintop, river, etc.). Then have 4 or 5 students at that table design their own animals that live in that area. Afterwards, let students who would like to share do so by bringing their papers to the front of the class and explaining the animals' features and functions.

## BIRD BEAK BUFFET

**Subject/goal:** Bird adaptation
**Grades:** 4-5
**Time needed:** 30 minutes
**Habitat/Environment:** Any classroom or outdoor space, preferably with tables
**Materials:** Plastic plates; cups; pictures of birds with different beaks; a variety of food items— beans, marshmallows, rice; "beaks"— plastic forks, tweezers, toothpicks

### Activity:

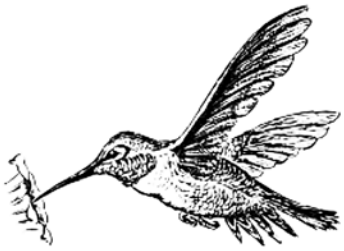


Discussion: Show students pictures of different birds and have students guess what they eat, based on their beaks. Tell students how each beak is used/what the bird eats.

### Examples:

- Eagles and hawks have strong, hooked beaks for tearing meat.
- Herons have dagger-like bills for spearing fish and frogs.
- Pelicans have pouched bills for scooping up fish.
- Hummingbirds have long tongues within tubular beaks for drinking nectar.
- Snipes have long beaks for digging in the mud for worms and other small creatures.
- Woodpeckers have chisel-like bills for searching under tree bark to find insects.

Place groups of 4 to 5 students around a table or in a circle on the floor. Give each student in every group a different "beak" or utensil, so each group has a mixture of tweezers, forks, and toothpicks. Make sure each student has only one utensil. The students must put one hand behind their backs and hold the utensil with the other.



Give each student a "stomach" or cup in which to place all the food they pick up. Put a tray or paper plate of a single food type in the middle of each group (their "feeding area"). Instruct students that you will give them 20 seconds to "feed" without using their fingers.

They must compete with the other birds in their feeding area to collect food and place it in their "stomach" (cup). Give the signal to start, and then stop after 20 seconds. For each food type, ask students which "beak type" utensil was most successful in collecting that food. Record on the board which beak types were best for which food type. Repeat for each food type available, switching the plates (so a group with beans now has a plate of marshmallows, etc.). Discussion: Were different beaks good for collecting different types of food? (Yes) Ask students to compare the utensils to beaks of real birds. Are any utensils similar to the pictures of bird beaks shown at the beginning

of class? Why can many different birds feed in the same geographic area? Is it good that different birds have different beaks? (Yes, because different types of birds aren't trying to eat the same thing. If they were all trying to eat one kind of berry, they would run out pretty quickly. Instead, bird types all have different beaks, eat different things, and they don't have to fight over food.)

## RECIPE FOR A HABITAT

**Subject/goal:** Habitats
**Grades:** 4-5
**Time needed:** 45 minutes
**Habitat/environment:** Any classroom or outdoor space, with tables
**Materials Needed:** Crayons, markers, or pencils, paper, glue, nature magazines

### Activity:

Divide students in small groups. Tell each group that they get to create any type of habitat. What habitat would they make? Have the students list characteristics/ingredients of their habitat. Have them draw a picture or create a collage with all their ingredients. Tell them to include animals, insects, and plants of all sorts. Ask them what kind of weather they would need for their habitat.

Share student drawings and then talk about a habitat they are interested in from around the world. Discuss the weather and types of plants and animals in these countries.

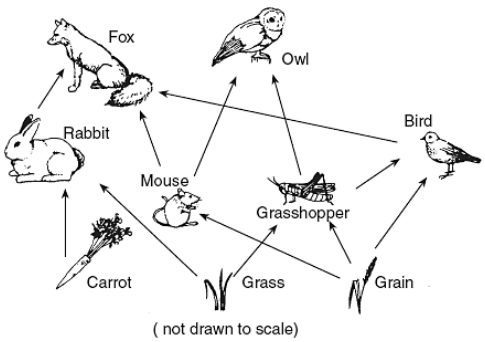
## FOOD WEB FOREHEAD GAME

**Subject/Goal:** How plants and animals are connected
**Grades:** K-3
**Time needed:** 35 minutes
**Habitat/Environment:** Any classroom or outdoor space Materials: Small cards with pictures of animals/plants/parts of nature; Post-its or double sided-tape; ball of string

### Activity:

Tell students that they are about to answer a riddle about members of the natural community in your park. Explain that you are about to place an animal or plant card on each student's forehead facing outward, so that they cannot read it, but the rest of the class can. They can ask yes or no questions to figure out what animal or plant they are.

Give students some examples of questions they can ask (Am I a plant? Am I a mammal? Am I bigger than a chair? Do I live in the water?)




Next, use tape or Post-its to place the cards on the students' heads. Let them mingle freely about the area asking questions until they've figured out their own riddle. As students finish, they can help others by answering questions.

When all the students know their plant or animal, get the group into a circle. Explain that all plants and animals are part of a community, and are all connected to each other. Some eat others, some provide food for the others, and some help each other in other ways. Give the students a brief moment to look at the information on their card and think about which plants or animals their own may be connected to.

Finally, make a "food web." Starting with yourself as the sun, pass the ball of string to someone in the circle that you are connected to (example: the sun gives its energy to the oak tree). Hold onto one end of the string so as you pass it on so that a web forms. The next person speaks their connection (example: the oak tree gives acorns to the squirrel) and passes the ball to the squirrel while holding a piece of the string. Continue until every person is holding a piece of the string.

Debrief: Is everything in this community connected? Would it matter if one piece of our web went extinct or went away? To test this, have everyone pull their string tight. On the count of three, have one person let the string go and ask how many people felt a tug in their string. Next have all the plants let go. Did the community "feel" this change? Ask students if they think every part of the community is important.

## SKULL STATION

**Subject/Goal:** Animal skulls give clues about animal lifestyle
**Grades:** K-8
**Time needed:** 10 - 15 minutes
**Habitat/Environment:** Any classroom or outdoor space with tables
**Materials:** Several skulls, including one herbivore/prey animal skull, pictures of the live animals those skulls came from.

### Activity:

Introduce this station by saying that many different animals live at the park they are visiting. Often when you are hiking there, you can find the bones of these animals; it is interesting to figure out what animal they came from. Reassure the students that these are not real skulls—they are just plastic models. Hold up a skull model. Ask the students,

"What animal do you think this skull came from?" After a few students have guessed with raised hands, tell them who was right. Ask this student, "Why did you say it came from a ____? How could you tell?" (If no student guessed right, you can tell them the animal). Then lead students through an analysis of clues that help you identify it. Look at the teeth of the animal and ask questions. ("Do these look like the teeth of an animal that eats meat or eats plants? These teeth are canines. What do they look good for?") You can also look at whether the eye sockets are on the skull are forward-facing (predator) or facing to the side (prey). Ask students why a prey animal that is used to being hunted might have eyes on the side of its head. Go through a couple different skulls this way.

## TREE-AGING STATION

**Subject/Goal:** Tree aging
**Grades:** K - 8
**Time needed:** 10-15 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** Tree rings or core samples, a picture of a tree or trees

### Activity:

Introduce this station by asking students if trees have birthdays. They do. Trees have ages just like we do. Some trees are very old. How old do the students think the oldest tree in the world is? (Look up this fact on a search engine—bristlecone pine.) Ask students if anyone knows how you can tell how old a tree is.

Show students a cross section of a tree or a "tree cookie" core sample. Show them how you can count the rings. Every year the tree gets a little fatter and grows a ring. The thin, dark line of each ring is from the winter months, when the tree didn't grow very much because it was cold and dark during the winter. The fleshy, thick lighter color of each ring is from the summer months when the tree had plenty of sun. Ask students if there are other things they could tell from trees' rings. Could they tell if there had been a fire? How? Could they tell if there had been a drought when the tree didn't get enough water? How?

Finally, pass out tree core samples or tree cookies to have the students figure out the age of their tree. Have the students share the age of their trees with the students next to them and anything else they think about the tree from its rings.

## NOCTURNAL ANIMAL PUPPET STATION

**Subject/Goal:** Nocturnal animals
**Grades:** K-8
**Time needed:** 10-15 minutes
**Habitat/Environment:** Any classroom or outdoor space
**Materials:** Animal puppets (tarantula, bats, snakes, etc.)

### Activity:

Tell students that there are lots of interesting animals in the park. Many of these animals only come out at night— they are nocturnal. Hold up one puppet at a time and ask the students to identify the animal. Then, give them fun facts about the animal and ask if they have ever seen one. Encourage discussion.

**Tarantulas –** Tarantulas are the biggest of spiders. They have eight legs and two big fangs; they are often hairy. Some are dull brown, while others can be brightly colored. The sizes range from as small as a fingernail to as big as a dinner plate—a very big spider.

Tarantulas can live in rainforests and deserts. They prey on insects, rodents and small birds. They hunt by stalking, slowly creeping up on the prey. Then they quickly leap onto their prey and stick their hollow, furry fangs into the prey. Venom is pumped in and liquefies the prey's insides. The spider eats it like bug soup.

Surprisingly, tarantulas spend a lot of their time hiding when they're not hunting. Lots of animals will try to eat them; some do not succeed, for the tarantula has a few good defenses. They are also pretty fast runners with those eight legs; if all else fails, they can bite. However, their venom is used mainly for eating prey.

Although the tarantula's reputation isn't that good, the tarantula is a wonderful arachnid. They are big, hairy, and poisonous, but their poison can't kill a person unless s/he's allergic to it. For most people, tarantula bites are no worse than a bee sting.

### Facts about the Tarantula

- Tarantulas will go bald on their thoraxes when they get old.
- Tarantulas have tiny hairs on the back of their abdomen and back legs that will stick to an enemy if disturbed and ITCH.
- Tarantulas have retractable claws, just like cats.
- Some tarantulas can get as big as dinner plates.
- A tarantula's bite is actually not that dangerous; no worse than a bee sting (unless you're allergic, of course).

**Bats –** Have sonar hearing called echolocation (they find their prey like we play Marco Polo.) Within more than 1,100 bat species, ranging from bumblebee-sized to the flying fox, three categories of bats have similar diets:

- Blood-sucking vampire bats (suck small amounts of blood of livestock; live in Mexico and southern hemisphere)
- Fruit bats (large species that eat fruits and live in southern hemisphere)
- Insect bats (eat lots of insects; these are the ones we have in California)

Insect bats are responsible for eating most of the mosquitoes and insect pests that bother us. On average, a bat eats 1,000 insects a night.

**Owls –** Owls' ears are not symmetrical on their heads. They have one ear higher on one side of their heads and one lower on the other side. Their eyes are extra big to see better at night. If our eyes were the size of owls' eyes in proportion to our skulls, they would be the size of plums.

**Coyote –** Omnivorous members of the dog family, these predators will eat anything. They use their sense of smell to forage. If we get our noses wet, our sense of smell improves as well. The clever coyote is a popular figure in Native American lore.

## "WHO AM I?" GAME STATION

**Subject/goal:** characteristics of things in nature
**Grades:** K-8
**Time needed:** 10-15 minutes
**Habitat/environment:** Any classroom or outdoor space, with room to move around
**Materials:** clothespins and images with the names of natural creatures or objects

### Activity:

Line the students up and pin each image with a clothespin onto their back shirt collar so that they can't read them. Tell the students that they all have something from nature on their back. It could be a plant, animal, or something not living like water or a cloud. They have to ask each other yes or no questions to figure out what they are. They may ONLY ask yes or no questions—no hints! Let the students mingle around, asking each other questions until they guess right.

## SONG STATION

**Subject/goal:** Songs about animals and trees
**Grades:** K-8
**Time needed:** 10-15 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** song boards, guitar (optional)

### Activity:

Teach the songs "Bats Eat Bugs" and "Live Oak" Talk to the students briefly about bats and what they eat. Tell them that bats eat bugs, and they help us by getting rid of all the pesky mosquitoes in the air. If students mention, vampire bats you can tell them that vampire bats only live much further south, such as in Mexico, Central and South America. They prefer to suck blood of livestock—not people.

### Songs -

**Bats Eat Bugs (by the Banana Slug String Band**

https://www.youtube.com/watch?v=tgi-GuATgXI)

Bats eat bugs; they don't eat people.
Bats eat bugs; they don't fly in your hair.
Bats eat bugs; they eat insects for dinner.
That's why they're flying out there.

Coyotes eat rabbits; they don't eat people;
Coyotes eat rabbits 'cause you're too big to bite.
Coyotes eat rabbits; they eat rabbits for dinner.
That's why they're out in the night.

Snakes eat mice; they don't eat people.
Snakes eat mice; that's why they're on the ground.
Snakes eat mice; they eat rodents for dinner.
And they don't want you hanging around.

Bears eat berries; they don't eat people.
Bears eat berries; they don't eat you or me,
Bears eat berries, and they might steal your dinner,
So you better hang it high in a tree.

Nothing out there wants to eat you,
Nothing out there wants to make you its meal,
Nothing out there eats people for dinner,
'Cause they know how sick they would feel.

### Live Oak

Chorus:

Live Oak Live Oak (clap clap)
Oooh, baby, let your xylem flow (woo!)
Yeah, yeah, yeah, yeah, yeah, yeah
Live oak, live oak
Oooh, baby, let your xylem flow (uh!)
Yeah, yeah, yeah, yeah

The xylem's under the bark
Where it's cool and dark.
It takes the wet from the ground
And it spreads it around.

The acorn's hat
Is scaly and fat,
And the squirrels think it's neat
To get an acorn treat,

It's the oak that's live;
It gives us food to thrive.
It's where the natives go
To get the acorns that grow.

## TWINKLE, TWINKLE, LITTLE STAR

**Subject/goal:** traditional campfire songs
**Grades:** K-8
**Time needed:** 10 – 15 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** None

### Activity:

With the students sitting on the floor, explain that we are going to do a campfire song. Tell them that we are going to sing "Twinkle, Twinkle, Little Star," but with a variation! Have the students cross their hands with palms overlapping and wiggle their fingers to create a "star."

Tell the students that when we sing the song, every time they sing a word with the letter "t" (say the name and give the letter's sound) in it, they need to raise their "stars." For older children, remind them not to forget the word, "the!"

Begin singing the song rather slowly – the students will follow your lead. Repeat the song at several different speeds including a "super-fast" version. Be sure to exaggerate the difficulty of the speed and the "recovery" time afterward.

### Additional Helpful Tips:

- For older students, or an active group, do the same as above only have them stand up, put their hands on their knees and stand up/bend over for every "t," so the students are, in essence, bobbing up and down.
- For grades K-2, you may omit prompting for the word "the" to reduce confusion—they aren't spelling it yet, and it doesn't have a "t" sound.

## POND STUDY

**Subject/Goal:** Pond life
**Grades:** 3-8
**Time needed:** 45 minutes
**Habitat/environment:** Outdoors by a pond
**Materials:** Nets, clear plastic cups and beakers, pond-life field guides and identification cards, pollution-tolerance guide, a large plastic tank

### Activity:

Rules: Insist that students keep their shoes on for foot safety; if they choose to go in the water, wade no deeper than their waists. Divide students into smaller groups led by different adults and space groups out around the pond. Sit students by the pond and introduce the pond study. Ask them whether the pond appears healthy. How would we know whether it is healthy? Help students arrive at the idea that the animal life in the pond tells us whether the pond is a well-functioning ecosystem, as well how polluted it is.

Students are given a plastic cup and may explore the pond and catch as many pond critters as they can. They may put anything they find in the large plastic tank and can use ID guides to figure out what the animal is.

After they have had time to explore, sit the group down in a circle and pass around containers with different critters inside. If a student has figured out what the creature is, have them announce the name, and use the pollution-tolerance guide sheet to say how tolerant of pollution the animal is. Add up the total number of creatures of each level of pollution tolerance (worksheet easily lays this out). Then ask the students how healthy they think the pond is. Did they find many different types of animals? Were many animals pollution intolerant? Have the students gently return their critters to the pond when done.

## OWL PELLET STUDY

**Subject/Goal:** Owl's diet as seen in owl pellets
**Grades:** K-8
**Time needed:** 30-40 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** Owl pellets, paper plates, metal probes, latex gloves, bone ID sheet

### Activity:

Explain to the students what an owl pellet is, and that you can find out what that owl has eaten from the pellet. Give each group of 2 students a paper plate, an owl pellet, a metal probe, gloves, and a bone ID sheet. Let the students dissect the owl pellet and try to figure out what the owl has eaten. How many different animals did the owl eat?

## SAFETY CLUES

**Subject/goals:** Basic outdoor safety
**Grades:** K-8
**Time needed:** 15-20 minutes
**Habitat/Environment:** any, classroom or outdoor, with tables
**Materials:** 10 clues/riddles (at least 2 sets), 15 answers (at least 2 sets); Velcro

**Preparation:** Make the clue cards

1. Put the riddle at the top of the page (leave plenty of space for the answers).

2. Example clue riddles:


   - Across the lands and on the sea, Christopher Columbus used this drawing of me. What am I? (map)
   - Oh sun, oh sun, your rays are bright. Sometimes I use this to cover my eyes. What am I? (sunglasses)
   - Cover me up from head to toe. Block the rays, and I'm good to go. What am I? (sunblock)
   - For bumps and bruises to the rescue I come; it's always good to have one of me at home. What's my name? (first-aid kit)
   - I can be found in black, gray, or brown. I protect your feet from the rocks on the ground. Please find me. (hiking boot)
   - Take me with you on a hike; take me with you on your bike. My name's not Joe, and people call me H2O. (water)

   - Keep me handy. I will not fail; I'll give you energy on a trail. What am I? (food)
   - I'm hip, I'm cool. Tell me your size. Superstars use me to dress in disguise. What am I? (hat)
   - Paparazzi, paparazzi, my very best friends — they capture your smile through my lens. What am I? (camera)
   - Texting, texting, day and night. I'm a BFF's texting device. What am I? (cell phone)

3. Laminate the cards

Using clipart, find an image that matches each of the 10 clues. Also find images of five or

so additional safety items that don't have clues to match (compass, clothing, hiking stick, bug spray, flashlight, etc.) Print the images out as big as possible but still able to fit on the page under the clue. Laminate and cut out the answers. Stick a square of Velcro on each clue page as well as on the back of each of the answers.

Choose an area with a table for each team (one set per team) and/or an open area.

### Activity:

- Divide the group into at least two teams or as many teams as you made sets of clues for. Preferably, every student gets a clue card. Assign a teacher/volunteer/helper to each table. Talk to the students about safety and items they should take with them when out hiking and/or spending "a long time" time in nature.
- Remember, you're encouraging students to get out in nature. Try not to scare them. Although they won't have most of this safety equipment with them, emphasize that this is if you're going out "all day" or if they're in the park for "a long time." Don't get sidetracked into talking about camping equipment (unless you have time), or the students may lose interest.
- Show the students an example of a clue card. Read the riddle aloud, and have the students guess what the answer is. No doubt, they will guess all sorts of things that could work so let them know that this is a tricky one, which is why "we're doing it together."
- Give the stack of clues and answers to the teacher/volunteer assigned to each team. Put the teacher in charge of how the end result is accomplished. In short, the students, as a group, need to match the answers to the correct clue.
- Execution of that plan varies from teacher to teacher and group to group. Some teachers will go over the clues together aloud with the whole group. Some teachers will give a clue card to each student, so he/she has to figure it out.
- Teams can race against each other to see who can finish first.
- Kinesthetic/relay option: Have the answers hanging up on a string or in a pile on the ground. Students must, one at a time, run to find the answer to their clue.

### Additional Helpful Tips:

- For the example clue, choose the clue that is the most tricky/complicated. In the examples above, it's "hat."
- For the kinesthetic/relay option, hanging up the answers [unless there's a Velcro board or something that Velcro sticks to easily] on a string takes time to set up—not the best option if on a tight schedule.
- To distinguish between the sets, for each set, place a symbol (in our case we used the State Parks logo) in a particular place on the page (top left corner, bottom right corner, top right corner, etc.). It makes sorting the sets out a lot easier if they accidentally get mixed up. Similarly, put a distinctive mark on the back of each set of answers—that way you don't have to match the clues every time they get mixed (and they will).

## NATURE HIKE

**Subject/goal:** observation skills and local flora and fauna
**Grades:** 3-8
**Time needed:** 20-30 minutes
**Habitat/environment:** Nature trail
**Materials:** picture cards of local flora and fauna (optional), magnifying lenses, diagram of plant anatomy, plant samples.

### Activity:

Scope out the trail ahead of time and determine places with things to see and discuss. The following are potential trail stop topics:

**Native plants**

- Identify a few plants and talk about how native Californians used them.
- Talk about how the plants support the native animal community.
- Use magnifying glasses to identify different features of plants.

(Have some plant samples and diagram of plant anatomy in backpack.)

**Creek / Signs of animals**

- Discuss density of vegetation around water source.
- Talk about amphibians – e.g., Pacific tree frog, western toad.
- Look for animal signs: tracks, scat, burrows, nests (scope out nests and burrows ahead of time if possible).

**Stop, Look, and Listen!**

- Have the students stop, look around for a moment, and then stand quietly, close their eyes for 30 seconds, and listen. Have them count how many sounds they hear. Take a few minutes to discuss their observations.

**Ocean / Marine animals (if trail has ocean view)**

- Question: What's the name of that great big ocean you all see?
- Question: What kind of animals live in the ocean?

Discuss some of things they might see during their visit to the beach, such as kelp, beach litter, seashells, small crabs, or tide pool life.

## "MY" PLANT HIKE

**Subject/goal:** observing nature
**Grades:** K - 8
**Time needed:** 15 - 30 minutes
**Habitat/Environment:** outdoors with a variety of plants
**Materials:** "My" plant cards: half-sheet of laminated paper with a picture of a plant and the words "My Plant" on one side and a two or three sentence description of the plant's unique characteristic/use/history/etc. Enough plant cards for every one or two students.

### Preparation:

- Walk along the planned trail, and take note of the plants along the trail.
- Take close-up pictures of the plant.
- Make the photos into plant cards that correspond with the plants found along the trail.

### Activity:

- As students enter the hiking trail, stop and briefly discuss the role of plants in the ecosystem and that part of being in nature is developing observation skills. When they become hike leaders, they will have to be able to observe and identify plants.
- Hand out the plant cards, one for each student or two. Explain that they will have to carefully watch for "their" plant; when they find it, please inform you (or raise their hands).
- Begin walking along trail. As the students identify the plants, have them read aloud the information on the back of their cards. Verbally discuss any additional information you may know about the plants. Let the students step closer to examine the plants.

### Additional Helpful Tips:

- If poison oak is along the trail, make a card for it, but keep it for demonstration purposes.
- Organize the cards before handing them to the students. Hand them out in this order: plants that come at the end of the trail, plants that are found in the middle of the trail, plants that are found at the beginning of the trail (so, in short, the plants will more or less be "found" from back to front of the line of students—but don't be too exact!).

Warn students whose plants are at the end of the trail that, "Your plant will be toward the end."

- Slow down, stop, or verbally mention to students when there are plants in a particular area that they haven't found.
- If there is not enough time, students are young, or it's so noisy that students can't hear each other reading, skip the read-aloud portion of the activity.

- Remind students who have completed the "My Plant" activity that they should keep looking for "their" plant during the other activities and on other trails.
- Ask students periodically throughout the day, "What do you remember about your plant?" to help reinforce what they have learned.

## UNNATURAL TRAIL

**Subject/goal:** Observing nature: natural vs. unnatural items
**Grades:** 3 - 8
**Time needed:** 30 - 40 minutes
**Habitat/environment:** Outdoor hiking trail
**Materials:** 12-20 unnatural items (we used brightly-colored pipe cleaners, but you could use a variety of litter items—plastic bottles, paper cups, chip bags, cardboard, paper, clothes pins, nails, plastic ware, etc.);

"Activity in Progress" signs (optional)

Preparation: Gather the unnatural items. Choose the trail for the activity in an area that has a variety of foliage.

Set up: Before the students arrive, place all the unnatural items in the designated area at various heights and locations.

- All objects should be on one side of the trail.
- Be sure objects are secured and won't blow away (this is one reason why we chose pipe cleaners—you can wrap them around branches and stalks)
- If in an occupied areas, you may want to put the signs out at the beginning and end of the designated section of the trail (this helps the students know when the designed area starts and stops, too)
- Do not tell students how many objects you placed in the area.

### Activity:

As students enter the hiking trail, stop and briefly discuss some or all of the following:

- The importance of observation skills in nature;
- The difference between natural and unnatural items;
- The problems that can arise out of leaving litter in nature; and
- The need to protect nature by cleaning up after ourselves and others.

Tell the students that you have placed a certain number of unnatural items on one side of the trail. You want them to:

- Look for the items;
- Silently count them
- Refrain from pointing to the items

Once all the students have filed past the designated Unnatural Trail, have them whisper to you or tell you quietly how many items they saw. Tell them how many there actually were.

## GOING ON A HIKE (NON-PARK LOCATION)

**Subject/goal:** Simulating hiking elements and safety
**Grades:** K-8
**Time needed:** 15-20 minutes
**Habitat/environment:** Classroom or play yard (non-park location)
**Materials:** None

### Activity:

With students standing at least an arm's length apart, announce the start of a "hike." Prompt them to repeat after you, and make an iconic movement to go with each statement:

- I'm going on a hike! (point at self)
- I've got my hat and water bottle. (hat on, clipping bottle to belt)
- I've got my map – to tell me where I'm going. (large unfolding book)
- I've got my compass or phone to tell me where I am. (looking at hand-held object)
- I've got my camera, in case I see something good. (take picture)
- Let's go! (start slapping upper legs with hands to mime steps)
- We're walking a loooong way. (continue regular cadence)
- Stop! (pause) I see a lizard! (pointing down at ground)
- I'm going to take a picture. Click! (take picture)
- I'm thirsty, so I'm going to drink some water. (unscrew cap, lift bottle)

Continue on with pointing up in the sky to a hawk, at a "tree trunk" for a moth, over at "bushes" for a deer. Stop and take a picture of each, "hiking" between them.

- Now I'm walking up a hill. (slow, heavy "steps")
- It's really steep. (exaggerated effort—repeat water stop)
- Finally at the top! Look at that view! (show turning to look at vista with hand above eyebrows)
- I'm going to take a panorama picture. (lift camera, turn slowly)

- Oh NO! It's getting late! I have to get back before dark! (look at watch)
- I'd better hurry! (step really fast)
- Wait! Where am I now? I'd better check my compass/ phone! (check )
- Where am I going? I'd better check my map! (look at map)
- I've got to hurry! (step really fast, make it big!)
- Wow! I made it home! (panting)
- I'm going to go inside. (open door, and shut it behind you)
- I'm going to take off my boots and hat. (show)
- I'm going to put away my water bottle and map. (show)
- I'm going to charge my phone. (show plugging in)
- I'm going to sit down on the couch. (bend knees like "plopping" down)
- Now I'm going to look at my pictures! (take out camera)
- I saw a lizard! (show fiddling with camera)
- I saw a hawk! (show)
- I saw a moth! (show)
- I saw a deer! (show)
- I took a panorama picture! (show)
- That was a GREAT HIKE!

### Additional Helpful Tips:

Variations: depending on attention spans and prior student knowledge, add in the proper names of animals seen, like "Red tail hawk" or "White tail deer." Give brief information about the animal, like "Fence lizards do pushups to scare other lizards away." Include seeing a snake if you've already covered snake identification. For older groups you can include accomplishment statements, like "It was a tough hike but I made it."

## REFLECTION POOL

**Subject/Goal:** Reflecting on our relationship with nature
**Grades:** 3-8
**Time needed:** 15-30 minutes
**Habitat/environment:** any, classroom or outdoor, outdoor preferred

Reflection = contemplate, reflect on relationship with nature

Pool = a pool of ideas, thoughts, messages that form one collage of writings

Materials: Reflection Pool cards (preferably one card per student), dry erase markers (one per Reflection Pool card), small mirrors (one per Reflection Pool card), flags/markers (one per Reflection Pool card); Velcro

## Activity:

Preparation: Reflection Pool cards - Using legal-sized paper, print directions on side. On the other side, write a positive comment and a question (a different set for every one or two cards), divide the paper into three sections horizontally, and include a thought bubble/cloud in each section.

### Example positive comments and questions:

- We're so glad you are here!
  How do you feel being in nature?
- Thank you for coming here!
  What are your thoughts as you sit here in nature?
- We hope you enjoy yourself today!
  What do you enjoy about being in nature?
- We hope you have a beautiful day!
  What colors in nature do you see around you?
- Thank you for visiting us in the park!
  What sounds do you hear around you?
- We hope you have fun today in the park!
  What scents to you smell around you?
- We hope today in nature is special for you!
  What is your favorite thing you see around you?
- We wish you a very happy day in nature!
  What shapes do you see in the clouds or trees?
- It's so nice having you here at the park!
  What words come to mind as you sit in nature?
- Thank you for sharing the day with us in the park!
  What do like best about being in nature?

Laminate the cards. Attach a small, flat mirror to the cards on the side with the directions. Using Velcro, attach a dry-erase marker to the bottom of each card.

Choose the trail: shady, not pedestrian-busy, very little or no poison oak, and some open areas—in case snakes are lurking.

On the trail, every few feet place a flag/marker into the ground with the Reflection Pool cards propped up next to and/or clipped to the flag/markers.

### Directions:

- Show the students a Reflection Pool card, and give them directions.
- Explain that they are going to sit down next to one of the cards. They need to choose one right away and cannot go to a different one.
- They will read their special messages, look in the mirror (thereby looking at themselves in nature), and after reflecting on the questions on their cards, they will write their responses in the first unused section on the card. In the bubble shape, they can each write a short message for the next person to read. (The last group can leave a message in the bubble for park staff.)

### Additional Helpful Tips:

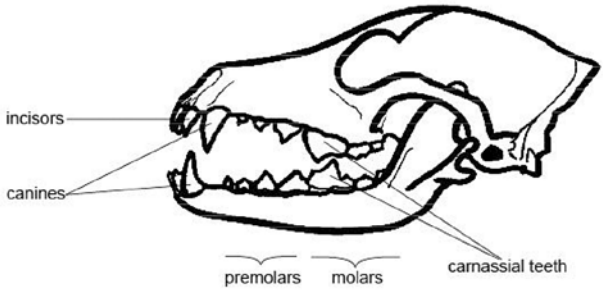
- Have the students in the last group bring you their cards and flags/markers.
- If possible, read the notes aloud to the group afterward (perhaps during lunch break?)
- Take pictures of some of the comments.

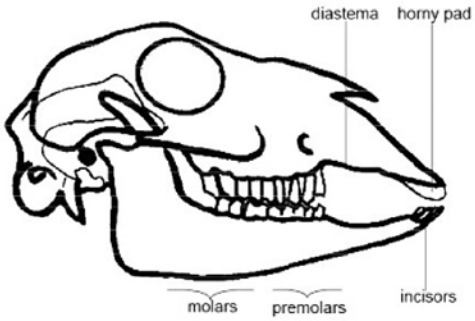
## PREDATOR/PREY

**Subject/goal:** herbivores vs. carnivores, predators and prey
**Grades:** 3 - 8
**Time needed:** 30 – 40 minutes
**Habitat/environment:** outdoors, somewhat open area so student can run around
**Materials:** Plastic skull of a carnivore, herbivore, and optional omnivore

### Activity:

Using the plastic skulls for examples, talk to the students about the differences between herbivores and carnivores based on their teeth and eye placement. To demonstrate the vision of a prey animal, have the students make a triangle with their thumbs and forefingers and then place that "triangle" over their nose (they may have to bend their thumbs to make room for their chin) to block their vision in front of them.




Talk about what and how herbivores/carnivores eat, their digestion, etc. Talk to the students about which characteristics they have—herbivores or carnivores? Or both? Talk about whether herbivores/carnivores are predators or prey. Choose a student or two to be predator(s) and choose three or four students to be prey.

Several feet away from the predator, have the prey stand in a group or row with their backs toward the predator. The predator quietly sneaks up on the prey, but every time the prey hears something, they turn around and whenever one of the prey turns around, the predator has to stop. (In short, this is a form of the childhood game of Red Light-Green Light.)

After a couple "starts and stops," have the students carefully watch the actions of the prey. When one student-prey turns around, all the rest will do the same—almost instantly. Explain that that action is protection which is why prey often stay in groups in the wild.

Explain that the predator has to be extremely quiet to sneak up on the prey, or else they won't catch their prey! It's possible that some student-predators will not be sneaky and will run and try and "get" their prey, at which time the prey will scatter. Again, a demonstration of what happens in nature.

Play several rounds either taking turns using small groups of students or else the entire group. Be sure to change up who is the prey and who are the predators.

### Additional Helpful Tips:

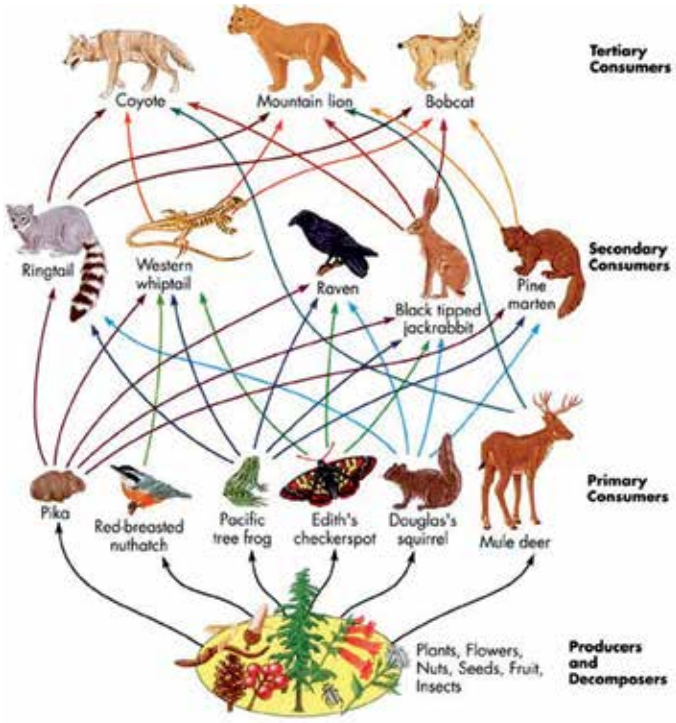
- A good game to play with students to help them burn some energy.
- Warning: Once the actual playing of the game begins, don't expect to spend as much time teaching as the students will be stirred up and won't listen as well. Do most/all the explaining and demonstrations with a very small, controlled group before playing.

## INTERDEPENDENCE/PREDATOR AND PREY

**Subject/goal:** adaptations and balance in nature
Grades: **3 - 8**
**Time needed:** 30 - 45 minutes
**Habitat/Environment:** Any open space, preferably outdoors, with room for kids to run around.
**Materials:** 4 small orange cones, 4 wristbands, 100 food chips (poker chips), 3 rope circles, chalkboard, chalk, eraser

Background: In an ecosystem, no single element can be changed without having some effect on other elements in the ecosystem. The connection of each part of an ecosystem to all of the other parts is called interdependence. For example, if a top predator, such as a mountain lion, is removed from an ecosystem, then the populations of the other animals in that ecosystem will be affected. The deer population, which would normally be kept in balance by predation by the mountain lion, would increase to a peak. During this peak time, the plant population would eventually be depleted due to increased grazing by the large number of deer. Once this occurred, the deer population would either have to move to a different location that had enough food to sustain the high population, or

some old, young, or sick deer would starve. Similarly, if the ecosystem experienced a drought year, plants would die, which would in turn affect the number of herbivores and omnivores that could feed on the limited resources. If these animals' populations decreased due to lack of food, then top predators would also be affected because of their limited food base. In other words, if one component of an ecosystem is altered, all of the other elements will be affected by the change. This is interdependence.




## Activity:

First, select local insects or animals that are predators and prey for each other. For example:

| Predators | Prey |
|---|---|
| Bats | Mosquitoes and flies |
| Mountain Lion | Deer |
| Bobcat | Rabbit |

Now choose students to be predators and prey. The first game should have about one predator for every six prey.

Put orange cones in the four corners of the playing area. Identify one end as a food source for the prey and one end as the permanent shelter for the prey.

Next, put food source (3 large poker chips per prey) and 4 rope circles on the field.

Have the predators put on wristbands and position themselves anywhere on the playing field. When you call "Start," the prey move from their permanent shelter to the food source. The prey and predators must walk. Prey need to get 3 pieces of food (poker chips) during the game, but they can only get one each time. The prey is successful if they reach the permanent shelter with 3 chips before the game is over.

The prey can use a few defense mechanisms to help them survive. The prey can call out to warn other prey and walk quickly to the rope circle for temporary shelter. They can stay in the circle for as long as they want but if they don't get enough food, they will die. Furthermore, the prey must have at least one foot in the temporary shelter to be considered safe from the predators.

If prey are captured, the predator must take the prey over to the sidelines to enjoy its prey. The predator must sit appropriately ("eating" their prey) on the sidelines for a count of 5 before they can re-enter the game. The predators should capture at least two prey before the end of the game to survive.

At the end of the time limit (5-10 minutes), count up the number of prey in the permanent shelter with 3 pieces of food. These prey survived! Each prey that doesn't have enough food will die. Count up the number of predators who captured at least two prey. If a predator hasn't captured enough prey, it will also die of starvation. Record the results and discuss any relationships the students observe. For example, the predators went really fast, so fewer prey survived.

**Discuss some of the following questions:**

1. What were successful hunting techniques used by the predators?
2. What were ways the prey escaped the predator? Which were the easiest escapes?
3. What did the predator do when the prey froze?
4. How is the predator a limiting factor for the prey?
5. What are important adaptations for both the predator and prey?

Play about four rounds, allowing new students to have a turn to be a predator. Conduct different rounds in different ways to help demonstrate the effectiveness of physical and behavioral adaptations, and demonstrate what happens when populations of prey and predators are not in balance. You can have students try to create ideas for additional rounds, but examples of possible other rounds are below:

- Have more predators. Do they wipe out the prey population, or is there not enough food to support them?
- Reduce the amount of food tokens. What happens to the prey?

## NATURE'S SYMPHONY

**Subject/goal:** Observing nature with more than sight
**Grades:** K - 8
**Time needed:** 30 minutes
**Habitat/environment:** Any classroom or outdoor space; outdoors preferred
**Materials:** Various household and hardware items with various textures and materials (e.g.: blocks of wood, foam, dowel rods, tins full of rice or beans, netting, drumhead leather, etc.)—enough items for one or two items per student; enough bins for containing all the items for each team (with 8-10 students on each team).
**Preparation:** Gather items together, put similar items and number of items in each bin

### Activity:

Divide the students into groups of 8-12 (larger groups are OK if there are enough items) in either a circle or around a table. Assign a teacher or a volunteer to each group.

Before giving each group a bin of items, talk to the students about sounds in nature. Explain that observation in nature doesn't have to be merely by sight alone.

Have everyone be perfectly quiet and still for 10 seconds, so everyone can listen to the sounds around them. (If the students are inside, have them walk outside for a few minutes to do this exercise.)

Talk to the students about the sounds they heard. Talk to the students about natural (wind blowing, leaves rustling, birds chirping, animal noises, water, rain, etc.) versus unnatural (car horns, washing machines, cell phone rings, etc.) sounds.

Show the students the bins and show them the items that are in it. Explain that the items in the bin are (generally) unnatural materials. Tell them that they, as a group, are to come up with three natural sounds using the unnatural materials.

Give the students 5-10 minutes to come up with their three sounds. Once their sounds have been chosen, have each group listen to the other group's explanation and demonstration of the nature sounds they made.

#### Additional Helpful Tips:

- Variation: Talk to the students about the ecosystem. Then tell them that they are to make a sound for major components of the ecosystem: water, plant, and animal.
- The more items in the bins, the better.

## CAMERA GAME

**Subject/goal:** Observing nature with eyes
**Grades:** K - 8
**Time needed:** 20 - 30 minutes
**Habitat/environment:** Outdoor trail
**Materials:** None

### Activity:

Before taking the students on a hike/walk, explain to them that you want them to take pictures (do the motions of taking a picture with an imaginary camera) of some of the things they see while on the hike, so they can look at/remember them later.

#### Along the hike, stop to "take pictures."

- Take panoramic pictures (to help place students geographically)
- Put the camera on macro settings and take some close-up pictures (leaves, for instance, are quite photogenic as it easily leads to discussions about various types of

leaves and leaf-shapes.)

- Put the camera on night-vision (to talk about nocturnal animals)

If there is time at the end of the hike, review some of the high points of the hike by having the students "look" at their "pictures."

### Additional Helpful Tips:

- The "Camera Game" is great as a component for a hike along with other activities.
- Have the students draw one of the "pictures" they took
- Have older students write a paragraph describing a "picture" they took

## IS IT A SNAKE OR STICK?

**Subject/goal:** Snake facts and identification
**Grades:** 3 - 8
**Time needed:** 10 - 15 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** Pictures of snakes and pictures of sticks – labeled on the back with snake species or the plant type, laminated, preferably print poster size.

### Activity:

Gather the students in an area where they can easily see the speaker and the laminated pictures. Discuss with students the importance of being able to recognize snakes on hikes for both their safety and the safety of their group.

Show a picture to the student and have them guess if it's a snake or stick. If the picture is obviously one or the other, make it a little more fun for the students by only letting them very quickly glance at the picture.

Depending on the plant, snake, etc., discuss some of the following with them: Camouflage, snake safety (under rocks, don't stick your hand anywhere you can't see, etc.), distinguishing snakes by their markings, fun information about each type of snake, venomous versus non-venomous snakes and how to distinguish them, venom versus constrictors, how snakes catch and eat their food, the ability to release injured wild snakes back into the wild after rehabilitation.

## SNAKE HEAD SHAPES

**Subject/goal:** Snakes
**Grades:** K - 8
**Time needed:** 10 - 15 minutes
**Habitat/environment:** classroom or outdoors
**Materials:** None

### Activity:

Briefly talk to the students about snakes in general. Explain that not all snakes are bad. Be sure to explain the benefits of snakes (reduce rodents, etc.).

Talk to the students about the differences between a poisonous and non-poisonous snake. Explain to the students that a way to tell which is which by their head shape Have the students put their forefinger and thumb tips together to form a triangle. Explain that this is the shape of a poisonous snake's head because the triangular parts are the poison sacks on the side of the snake's head.

Have students give a thumbs up. Explain that non-poisonous snakes have smooth jaws and heads like their thumbs.

Discuss what they should do if they see any snake in a backyard or neighborhood playground.

- Leave it alone "If it has a mouth, it might bite you!"
- Make sure everyone stays away from it
- If it is poisonous, let an adult know immediately.

## BOAT TOUR

**Subject/goal:** See wildlife around lake
**Grades:** 3 - 8
**Time needed:** 45 minutes
**Habitat/environment:** barge or boat on a lake
**Materials:** wildlife presentation materials, binoculars (optional)

### Activity:

Bring wildlife interpretive materials to assist with tour. Share eagle information and if time allows talk about local history. Add or subtract from material as needed depending on scheduling.

## PELT PRESENTATIONS

**Subject/goal:** Local wildlife
**Grades:** K – 8
**Time needed:** 15-30 minutes
**Habitat/environment:** any, classroom or outdoors
**Materials:** variety of animal pelts, feathers, wings

### Activity:

Present pelts in any fashion appropriate. Add or subtract from material to account for the rotations. This presentation works well being done for the students waiting to go on the boat.

## GPS USE—GEOCACHING

**Subject/goal:** outdoor navigation
**Grades:** 4 - 8
**Time needed:** 30-40 minutes
**Habitat/environment:** any outdoors
**Materials:** GPS units, pre-determined waypoints set up, optional scavenger hunt "treasures" to find at waypoint locations

### Activity:

Teach the students to use a GPS for geocaching or other outdoor navigation by marking a single waypoint (go to the map, move cursor to current location, click options "New Waypoint"). At this waypoint (at a location slightly out of camp or a little further away from the meeting area), hide an object such as a skull or handkerchief. The students can use a GPS unit in small teams to follow navigation arrows to find the hidden object at the location.

## GEOCACHING TOURS

**Subject/goal:** Teach students about local area
**Grades:** 3 – 8
**Time needed:** 30-60 minute
**Habitat/environment:** any outdoors
**Materials:** handheld GPS units, enough for 1 per 4-5 students, geocache directions

### Activity:

- Total round trip – 1.0 mile.
- Need to be able to "adapt and overcome" when dealing with time constraints and students abilities and weather conditions. DO NOT TURN INTO DEATH MARCH.
- Do not need to go to every "cache". Or in order. Can expand presentation at each "Cache" to cut down on physical exertion.
- If students show signs of heat related illness. Cut tour short and send to the "swimming / beach games" station for cool down.
- Make sure to be comfortable. Low-pro equipment authorized. Vest optional. Hiking boots welcome. Bring backpack. Drink plenty of fluids!! Take breaks when needed.

### Sample Geocaches:

These geocaches were developed for Millerton State Recreation Area. You can create your own geocaches for your park based on its features. You can adjust the number of stops to the time allotted and the area covered.

#1 – Grange Grove Point /In tree Topic – "what is geocaching?" /

#2 – Southwest Grange Grove / BBQ grill. Topic – "animals of the park" / rattlesnake & mountain lion precautions.

#3 – Lower La Playa / In Tree. Topic – Friant Dam / Court House facts

#4 – Upper La Playa / In tree. Topic – Grinding rocks (See attached map for location)

#5 – Upper Grange Grove / Old Grange Grove sign. Topic – Native American tribes in the area.

### Event information

- 1 chaperone per 10 students
- ALL calls for service will be handled by officers not associated with the event.
- Everyone involved with the event needs to watch the clock in order to make the rotations work...
- Drink plenty of fluids!

## NATURE SCAVENGER HUNT

**Subject/goal:** build nature observation skills
**Grades:** K – 8
**Time needed:** 30 minutes
**Habitat/environment:** any outdoors
**Materials:** lists of scavenger hunt items appropriate for your area.

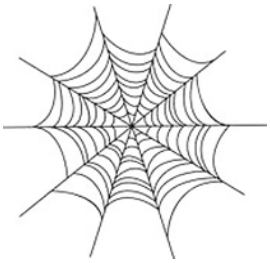
### Activity:

Find something that fits each category of their list. Write down what it is you found that fits the item on the list. Answer the questions in the "Find" section when you find the item listed. Please do not pick any plants or move any objects. Leave everything as you found it!!!

### Colors

- Find something green
- Find something red
- Find something brown
- Find something yellow
- Find something blue
- Find something orange
- Find something purple

### Touch



- Something hot
- Something cold
- Something wet
- Something dry
- Something rough
- Something smooth

### Find

- A bird feather. What does it look like?
- A butterfly wing. What color is it?
- Something bigger than you.
- Something smaller than your fingernail.
- Animal "scat" (droppings). What animal did it come from?
- An animal's home. What is it made of?
- A spider web. Where is it?
- A flower. Does it smell like anything?
- Something round.
- Something spiky.
- Three different types of leaves. What shapes are they?
- A flying bug. Where is it flying to?
- An animal footprint. What animal do you think it came from?
- Something that doesn't belong.
- What is the oldest thing you can find?
- A rock with an interesting shape. What does the shape remind you of?

### Hear

- Spend 30 seconds with your eyes closed, listening to the sounds of nature....what do you hear?
- A bird call. How does it sound?
- A man-made sound. What makes the sound?

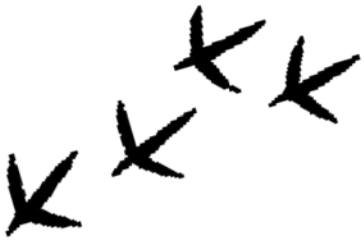
## EXPLORING YOUR HOME AWAY FROM HOME

**Subject/goal:** Building observation skills
**Grades:** 2 - 8
**Time needed:** 20 minutes
**Habitat/environment:** Park, visitor center, campground, etc.
**Materials:** none

### Activity:

Explore the campground, park, visitor center or whatever site you are visiting to find the following items. How are these items similar or different from what you see at your home?

1. feather
2. something moving in the wind
3. leaf
4. an animal track
5. one camouflaged animal or insect
6. something round
7. something fuzzy
8. a piece of fur
9. man-made litter
10. something perfectly straight
11. something beautiful
12. something colorful
13. something old
14. something new
15. something important in nature
16. something that reminds you of yourself
17. something soft
18. something that depends on the sun
19. something that reminds you of home
20. a big smile



## PARK SCAVENGER HUNT

**Subject/goal:** Build observation skills
**Grades:** K - 8
**Time needed:** 20 - 30 minutes
**Habitat/environment:** Any, indoor or outdoor, depending on where the answers to the clues are to be found.
**Materials:** prepared question sheets

### Activity:

The following questions were developed for Bolsa Chica State Beach; they can be adapted for your park by modifying them, using features and information relating to your local park.

#### Sample Scavenger Hunt Questions

1. What year was this state park founded?
2. Count the stairs of the main staircase.
3. How many flavors of shaved ice are there?
4. When is the next Junior Ranger program?
5. What organization's logo is the pelican?
6. Who has adopted this beach?
7. What animal is not allowed on the beach?
8. Who painted the murals on the doors?
9. Count the windows on the lifeguard tower.

## BEACH ANIMALS DISCUSSION

**Subject/goal:** animals found near or on ocean beach
**Grades:** K-2
**Time needed:** 30 minutes
**Habitat/environment:** Any, classroom or outdoor
**Materials:** 1 object or picture for every animal/character in the Interactive Story:

- Sea lion skull
- Sea lion puppet
- Gray whale model
- Gray whale baleen

- Stingray puppet
- Cottontail rabbit puppet
- Bottlenose dolphin puppet
- Sand crab laminated picture
- Western gull stuffed animal
- Leopard shark puppet
- Plankton laminated picture
- Jellyfish laminated picture
- Sandpiper laminated picture
- Brown pelican stuffed animal

Introduce self and your state park. Ask the students if they like the beach and if they like animals. Tell them that there are many animals at the beach, and we are going to be exploring them today and then we are going to participate in an activity afterward.

Take out one object at a time. Let the students guess which animal it is. Once they have guessed the animal, deliver a few interesting facts about the animal before moving on to the next animal. Allow 1-2 students to share something they know about the animal.

Listed below are possible facts to share about each of the animals:

**Sea lion:** The sea lion is a mammal. Many people think that they are seals, but there are 2 major ways to tell the difference between seals and sea lions. First – sea lions have little earflaps on the side of their head. Seals do not; they have a little hole on the side of their head. Second, both seals and sea lions have their hind flippers behind them while swimming in the water. However, when sea lion come onto land, their hind flippers flip forward so they can walk on all fours – like a dog. They are sometimes called the dogs of the sea. What do they sound like? (Ask students to demonstrate). Who would win in a race on land – a seal or a sea lion? (a sea lion!)

**Gray whale:** Gray whales are mammals. They have patches of white all over their skin; does anyone know what these are? Barnacles! Just like the gray whale lives in the ocean, the barnacles live on the gray whale. Do gray whales have teeth? No! They have soething else that is like teeth. It is called baleen, and

it is kind of like a brush. Since the gray whales do not have teeth, what do you think they eat? They can't eat fish because they cannot chew the fish. They eat something like plankton called amphipods! (show picture of plankton) Gray whales will dive to the bottom of the ocean and open their mouth to inhale a bunch of plankton – but other stuff gets in there too! What is on the bottom of the ocean? [Sand, water, plants] Does the gray whale want to eat all of that stuff? No! The baleen acts as a filter and all of the things it doesn't want to eat will go out of its mouth, through the grooves in the baleen and the plankton (amphipods) sticks to the baleen, which they then lick off of the baleen with their 2,000-pound tongue!

**Stingray:** Sting rays like to live in the shallow area of the water and camouflage themselves under the sand. What do you think happens if you accidentally step on a stingray? They can sting you! The sting on their tail is their only means of defense – they don't have hands or feet to push you away, and they don't have teeth to bite. If someone is stung by a stingray, we soak their foot in a bucket of hot water for about 30 minutes, which helps the pain to go away. There is a way you can avoid being stung by a stingray – the Stingray Shuffle! When you go into the water, instead of taking big steps, shuffle your feet instead. This kicks up a bunch of sand, and the stingray will think that a predator is coming and will swim away.

**Cottontail rabbit:** Did you know we have rabbits at the beach? They like to live in the brush and bushes around our buildings. What do they like to eat? Grass! The grass wears down their teeth, but luckily, their teeth never stop growing! How does the cottontail move? It hops! But if a predator is coming after it, it will hop in a special way – in a zigzag pattern. Why do you think it does this? Who likes to play tag? If you are playing tag, and you are running away from someone, is it easy to catch you if you run in a straight line? Yes it is— because the person who is "IT" knows where you are going. But if you run in a zigzag line, is it easy to catch you? No! Because the person who is "IT" doesn't know where you are going! It is the same thing with a cottontail rabbit. If they hop in a zigzag pattern, their predator doesn't know where it is going, so it is easier to escape!

**Bottlenose dolphin:** Bottlenose dolphins are some of the most common animals that we see at the beach. They love to hang out in groups (pods) and are very social, just like humans. Are they mammals? Yes!

They need air to breathe, which is why we see them a lot, because they like to porpoise in the water. Does anyone know what porpoising is? It is when they jump up and down in the waves (demonstrate).

What do they like to eat? Fish! When you eat a piece of pizza, what do you do? You chew it. But bottlenose dolphins do not chew their food. Instead, they use their conical teeth to grasp and tear their food into tiny bits so they can swallow it.

What color are dolphins? They are darker on top and lighter on the bottom; can anyone guess why this is? It is a special form of camouflage called countershading. Who can tell me what camouflage is? It is when something blends in with its environment. Dolphins are darker on top because the ocean is dark, so if a predator (something that wants to eat it) is above the dolphin, the dolphin blends in with the dark ocean. Dolphins are lighter on the bottom, because if you look up when you are in the ocean and the sun is shining down, it is bright and light. If a predator is below the dolphin, they blend in with the light from the sky.

**Pacific mole sand crab:** Who has ever gone digging for sand crabs at the beach? Do you know the best way to find them? If you are by the wet sand, right by the ocean, you will see little holes in the sand. Usually, if you dig there, you will find sand crabs! These are special sand crabs because they only move backwards. Who knows how to crab walk? (Have a student demonstrate) What do you think sand crabs eat? Plankton! They will uncurl their antennae when a wave comes up and they will use their antennae to grab plankton from the ocean.

**Western gull:** Who is one of the most common birds you see at the beach? The gull! What do they like to eat? They are supposed to eat fish, but they will come after anything, from your food to your trash. That is why it is always important to throw away your trash—because animals might try to eat it because they think it is food. Gulls will even try to snatch food from the mouths of other animals, like sea lions!

**Leopard shark:** What animal do you think this is? A leopard shark! Leopard sharks are not a scary shark; they do not go after humans and are not very big. They are one of the most common sharks along the California coastline.

What do you think they eat? Fish, for the most part, thought they are one of the biggest predators of the stingray.

How do sharks swim? They move their tail back and forth (demonstrate). How do dolphins swim? They move their tail (fluke) up and down (demonstrate). This is how you can tell the difference between and dolphin and a shark when you see a dorsal fin (the top fin) in the ocean. Of course, if you see a fin while you are swimming in the ocean, your best bet is to always swim for shore and then figure out if the fin belongs to a shark or a dolphin.

**Plankton:** Who watches Sponge Bob? What is the name of Sponge Bob and Mr. Crab's enemy? Plankton! Plankton is very, very small – you need a microscope to see it. It is also the food of a lot of animals, from the very small – like the Pacific mole sand crab, to the very big – like the gray whale (which eats a bigger form of plankton called amphipods). Plankton is used by scientists to help measure the health of the ocean.

**Jellyfish:** Jellyfish do not appear often at Bolsa Chica State Beach, but we will have waves of them every few years. Inside of their bell-shaped body is their mouth and this is where they take in food and let out waste. They also squirt water from their mouths to propel / shoot themselves forward in the ocean. Their tentacles can sting, but they do not purposefully attack humans. They eat fish, shrimp and crabs.

**Western sandpiper:** This little bird loves to run up and down the beach to find its food. What do you think it eats? Sand crabs! Because of their long bill, they are able to probe into the sand for their food.

**California brown pelican:** This is another one of the most popular birds on the beach. It is the smallest of the pelicans and one of the only pelicans that will dive straight down into the water for its food. It has excellent eyesight, so when it is flying, it will be able to see a fish in the water from 20 – 60 feet up in the air. All of a sudden, it will stop and just dive-bomb straight down into the water. If you are watching, it looks like the bird just fell from the sky! When it hits the water, the force will knock out the fish! The pelican's feathers are waterproof, just like a duck. It also has the largest throat pouch of any bird on Earth. It can hold up to 3 gallons of water! It also has a very large wingspan – seven feet!

## BEACH ANIMAL NAMETAGS

**Subject/goal:** Relate to the beach animals
**Grades:** K - 8
**Time needed:** 5 minutes
**Habitat/environment:** Any, classroom or outdoor
**Materials:** Cardstock nametags pre-printed with picture of local animal on one side, yarn, hole punch, pens,

In order to help the students connect on a personal level to the animals that they were learning about, assign each student an animal to "adopt" at the beginning of their field trip, before they began any of the day's activities. Animals are assigned at random. Try to give out the same amount of each animal, as they will be working in their animal groups in some of the activities. In each of the three programs, students learned about all four animals (dolphin, rabbit, stingray & pelican), however they participated in activities based upon their adopted animal and they became experts about their adopted animal.

Create the beach animal nametags and place interesting facts about each animal on the back. Print them on cardstock and then laminate them for durability. Hole-punch them and strung them on yarn. We created one for each student and this was something that the students were able to take home. Even with something small like this, many of the students were excited that they got to take it home. We noticed that many of the students had a sense of pride about their animal and by the end of the day, many of them had, indeed, became experts about their adopted animal.

## ANIMALS OF THE BEACH MOVEMENTS

**Subject/goal:** Animals at the beach
**Grades:** K - 8
**Time needed:** 10 minutes
**Habitat/environment:** open area on or near beach
**Materials:** Open space, movements/characteristics for discussion

### Activity:

Go through each animal and demonstrate movements and have the students copy the movements. This activity leads into the next few activities.

#### Round Stingray:

- make arms into a large circle
- stingray shuffle
- describe how they defend themselves
- discuss what to do if you were to get stung

#### Desert Cottontail:

- hop in a zig-zag pattern (use this to escape predators)
- discuss camouflage

#### Brown Pelican:

- spread arms as long as possible (have participants 'soar')
- 7' wingspan

#### Pacific Bottlenose Dolphin:

Discuss the 3 key things they need to swim:

- fluke (make a fluke with your feet)
- pectoral flippers (use hands to 'clap' like a dolphin)
- dorsal fin (use hands to create a dorsal fin)
- used for steering
- have participants steer their way around with a dorsal fin

Have participants spread out to allow room for movement.

Ask a participant which animal they would like to start with and begin to discuss the movements/characteristics outlined above. Attempt to make connections from one animal to the next to illustrate how related some of them are (i.e.: pectoral fins of dolphin to that of the stingray)

## SWIMMING/BEACH ACTIVITIES

**Subject/goal:** Fun on the beach
**Grades:** K - 8
**Time needed:** flexible, 30 - 60 minutes
**Habitat/environment:** lake or ocean beach
**Materials:** flexible, any props needed for beach games or activities

- Lifeguards are assigned only to cover the beach, NOT to assist with beach games. Focus needs to be on only one thing – public safety.
- "Sandy Soccer" and other beach games.

## BEACH OBSTACLE COURSE

**Subject/goal:** Animal locomotion
**Grades:** 3 - 8
**Time needed:** 30 minutes
**Habitat/environment:** outdoor space on or near beach
**Materials:** (materials listed are for 4 teams going at once), station markers, 9 wood stakes, 4 blindfolds, 4 large buckets, 7 small buckets, 15 small cones animal 'food', fish figurines, crab figurines, grass/leaves, 20 sand colored flying discs

Set-up the station markers on the wood stakes and place the following order, allowing for enough sand space for each activity in between.

### Activity:

1. Can you see with your ears?
   - place the 4 blindfolds in a small bucket near the station marker
   - use 10 cones (5 on each side) to delineate a pathway to the next station

2. Pelican Dive!
   - pair 4 small buckets with the 4 large buckets near the station marker

3. Zig. . . Zag. . . Escape!
   - use 5 cones to create a zig-zag path to the next station

4. Lunch!
   - place the animal 'food' in a small bucket by the station marker

5. Stingray Shuffle!
   - place an empty small bucket at the station marker
   - scatter the flying discs between the station marker and the habitat station markers

6. Home Sweet Home
   - place the habitat station markers in a row

Group the participants into 4 teams (based on nametag animals). Explain the course and reiterate the details at each station as mentioned on the station markers. During their turn, a participant from each team will be blindfolded. They must be quiet and depend on their ears to listen to their teammates as they talk them to the next station.

Once at station 2, they can take off the blindfold. The participant will then fill the small bucket half way with sand and pour it into the larger bucket (be sure to empty the buckets between turns).

At station 3, they will hop in a zigzag around the cones to make it to station 4 where they must find the ideal food for their animal (using the station marker as reference).

Once they have their food item, they will run to station 5 and drop it in the empty bucket. They must then think about their animal's ideal habitat and shuffle their feet through the flying disc to that habitat marker (1 for each animal).

Once there, they can have a seat and cheer on the rest of their team as they go through. For the last participant on each team, grab a volunteer from those who have already gone to help with the first stage as a 'talker.'

## WHO'S WHO?

This activity was developed for a coastal environment but can be modified for use in other environments.

**Subject/goal:** Beach animal traits
**Grades:** 3 - 8
**Time needed:** 15-20 minutes
**Habitat/environment:** open area outdoors or indoors
**Materials:** Open space, 2 small cones

Set both cones approximately 5 yards from each other.

### Activity:

Have the participants line up shoulder to shoulder (with a little space between them) at one of the cones. Explain how the game works and that they need to think about the animal they are (using nametag animals) and what characteristics/traits they think might

belong to them. If a trait belonging to their animal is read out, then they must move like that animal to the other cone. If another trait is read belonging to them, then they move back. Explain that some traits will belong to multiple animals and begin with an easy one that gets everyone to move.

### Movements

1. Brown pelican: spread arms and 'fly' across
2. Pacific bottlenose dolphin: use hands to make a dorsal fin and 'swim' across
3. Desert cottontail: hop in a zig-zag across
4. Round stingray: make a circle with hands and shuffle across

### Sample Traits List

| | |
|---|---|
| CSD | give birth to live young |
| SP | lay eggs |
| CSDP | live along the coast |
| CSD | uses camouflage |
| D | uses echolocation |
| C | eats grasses and other leafy plants |
| PSD | likes to munch on fish |
| PD | doesn't chew their food |
| SD | can swim |
| P | pouch can hold up to 3 gallons of water |
| CD | mammal |
| S | has a barbed tail for self-defense |
| S | prefers shallow, muddy waters |
| DS | has pectoral fins |
| S | undulates to move |
| P | has hollow bones |
| DS | predators include sharks and some types of whales |
| C | active mostly at night |
| C | tail also acts as a warning signal |
| CP | predators include large birds, like hawks and owls, and |
| C | uses its ears to regulate body temperature |
| CP | builds a nest for their young |
| D | live in pods |
| P | prefer to give birth on islands |
| P | raise their young on colonies |

Key: C=Desert cottontail, D=Bottlenose dolphin, P=Brown pelican, S=Round stingray

## ANIMALS OF THE BEACH CRAFT

**Subject/goal:** craft related to animals already covered
**Grades:** K - 5
**Time needed:** 30 minutes
**Habitat/environment:** Classroom preferred, with tables
**Materials:** Templates, pages of magazines; cut into ½ inch strips (use a paper cutter), scissors, glue sticks (colored glue works best), pens/pencils, tape, googly eyes, glitter, cotton balls, silver raffia

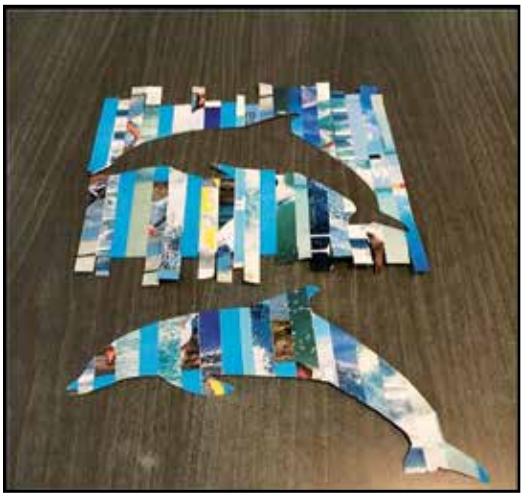
### Set-up:

Tables will be set up as a "craft area" for students to create their recycled magazine animals. All necessary supplies will be set out and a brief introduction and craft demonstration will be given at the start. Then the students will be able to create their animals.

**Step One:** Instruct students to write their names on the middle of their "adopted" animal. Flip to the back and cover the backside with glue (colored glue sticks work great so they can see where the glue is).

**Step Two:** Using the pre-cut ½ inch magazine strips, instruct students to glue down strips; the strips can be laid down in either direction or at an angle. However, they must be laid down in the same direction once a direction is started. The simplest is to start at one end and go across. Leave no gaps or spaces between strips.

**Step Three:** Make sure every strip is glued down well, flip it over and cut out using the template lines as a guide.



**Step Four:** Each creature has a unique feature (* see supply list). The last step is to add a googly eye (two eyes for the stingray) and the following;

California Brown Pelican: Wing feather

Round Stingray: Glitter on middle of tail for the barbed stinger

Bottlenose Dolphin: Silver raffia spout (make with tape)

Desert Cottontail: Cotton tail

## SAND SOCCER

**Subject/goal:** Physical activity
**Grades:** 3 - 8
**Time needed:** 15 - 20 minutes
**Habitat/environment:** open area on sandy beach
**Materials:** 8 small cones, soccer ball

Set up soccer goals using mini cones for the goal area and "field" parameters. Divide students into teams based on which animal they had made, so teams can become the CA Brown Pelicans and the Round Stingrays (for example) versus the Desert Cottontail Rabbits and the Bottlenose Dolphins. Keep the "field" itself small (sand running is hard!).

## INTERACTIVE STORYTELLING

This story is an example of an interactive story telling activity with a story based on the beach animals already covered in previous activities. This type of activity can be modified for the environment of your park and its flora and fauna.

**Subject/goal:** Ocean environment
**Grades:** K - 5
**Time needed:** 20-30 minutes (excluding prep and costuming)
**Habitat/environment:** any, classroom or outdoor
**Materials:** Storytelling materials

- Waves / Ocean (2): Blue fabric (wave it back and forth)
- Pelican (3): Feather half mask
- Sammy the Stingray (1): Elastic band with Velcro & tail (from costume)
- Rabbit (2): Headband with pipe cleaner ears
- Dolphin (2): Cardboard fin w/ elastic straps & Velcro
- Sea lion (3): Half mask painted brown w/ pipe cleaner whiskers
- Sunshine (1): Sunglasses w/ sun made from cardstock
- Sand crab (6): Headband w/ pipe cleaners (curled)
- Western gull (3): Feather half mask
- Whale(2): Headband with pipe cleaner spout
- Leopard Shark (2): Spotted Cardboard dorsal fin w/ elastic straps & Velcro
- Fish (15): Masks w/ jewels
- Plankton (4): Headband w/ pipe cleaner antennae

- Seaweed (2): Seaweed
- Jam & Jerry the Jellyfish (2): Elastic band w/ Velcro & fabric strips
- Sandpiper (3): Feather half mask

(53 total costumes—adjust number of fish and sand crabs for group size)

Once you have shared facts about each of the animals, ask the students if they like stories. Then ask them if they like animals. Tell them that they get to be a part of a story about the animals of the beach, and that they will get to wear costumes! If they do not want to participate and wear a costume, that is okay. They can be a part of the audience. Ask students who do not want to participate to sit in the back, so they can see the story take place.

Start with the costume of Sammy the Stingray. Sammy will be onstage the entire time, so they student who is Sammy should be someone well-behaved who doesn't mind being the center of attention.

When handing out the costumes, let the students know what their movement is going to be. They need to do this movement every time they hear their name. So every time you say "Sammy," he/she needs to shuffle. Every time you say "ocean" the students wave the fabric back and forth, etc. It is best to demonstrate the movement and then have the students do the movement so that they remember what to do.

After the Sammy costume, hand out the waves/ ocean costume, the seaweed costume, and the sun costume. These characters will also be onstage the entire time. Sammy will be in the middle, with the ocean behind him/her, the sun behind the ocean and the seaweed off to the side. After this, you can hand out the costumes in any order.

We have found that it works best to hand out the costumes in order of how they appear in the story, leaving the fish, birds, plankton and crabs for last, as there are many costumes for these characters. It is best to have at least one person for each type of costume. If there are not enough students for this, then cut out that part of the story.

We have found it works best to arrange the students in a semi-circle around the "stage" to await their turn to go on "stage."

Remind students that when they hear the name of their character, they are to come on stage near Sammy and every time they hear the name of their animal / character, they are to perform the movement you taught them. It helps to have a second adult to direct the students to the "stage," help hand out costumes and remind the students of their movements.

Once all the costumes are handed out, read the story. It helps to emphasize the names of the characters to remind the students to act out their parts. You can also do the movement to remind the student what to do.

When the name of each animal is mentioned in the story, the students that are that animal will do the following movements:

- **Ocean:** Make waves with fabric
- **Pelican:** Spread arms and flap
- **Sammy the stingray:** Shuffle feet
- **Cottontail rabbit:** Hop
- **Dolphin:** Jump (porpoise)
- **Sea lion:** Lightly clap hands
- **Sunshine:** Wave arms up in air
- **Sand crab:** Crab walk
- **Western gull:** Flap hands like wings
- **Whale:** Move hands like a spout
- **Tiger shark:** Snap hands like jaws
- **Fish:** Make a fish face
- **Plankton:** Arms out, move as if floating
- **Seaweed:** Wave seaweed
- **Jellyfish:** Twirl around
- **Sandpiper:** Bob heads as if poking the sand for sand crabs

## THE STORY OF SAMMY THE STINGRAY

(Names of characters are bolded – when there are bolded word, there is a character movement)

**Sammy** was a very happy stingray. **Sammy** loved where he/ she lived.

Where does **Sammy** live? The **Ocean**!

**Sammy** loved to swim in the **ocean** under the bright, hot **Sun**. He would swim in and out of the **seaweed** and look for new friends.

One day, while **Sammy** was swimming, he/she met some **sea lions**!

"Hi" said **Sammy**.

What do you think the **sea lions** did? They **barked**!

"Well, nice to meet you" said **Sammy** as they swam away.

Next, **Sammy** met some **dolphins** swimming in the **ocean** under the **sun**.

"**Hi**" said **Sammy**. What do you think the **dolphins** did? They **porpoised**! That means they

jumped in and out of the waves.

"Well, nice to meet you" said **Sammy** as they swam away.

Who do you think **Sammy** met next? Why only some of the biggest creatures in the ocean, the **gray whales**! **Sammy** wasn't scared of the **gray whales** because they only eat plankton!

"**Hi!**" said **Sammy**.

What do you think the **gray whales** did? They **spouted water from their blowholes**!

Luckily, **Sammy** likes water because water got everywhere!

"Well, nice to meet you." Said **Sammy** as they swam away, under the **sun** and through the **seaweed**.

Who do you think **Sammy** met next? Uh oh! **Leopard sharks**! Did you know that **leopard sharks** are the predators of stingrays? That means they like to eat them! What do you think **Sammy** did when he/she saw the **leopard sharks**? He/ She **swam** away as fast as he/she could! What do you think the **leopard sharks** did? They **chased** him / her!

Luckily, **Sammy** got away.

Pretty soon, **Sammy** got hungry! What do you think **Sammy** eats? Small **fish**! Just when **Sammy's** stomach started grumbling, a beautiful school of **fish swam** through the **seaweed. Sammy** loved all their pretty colors & he became so distracted by them that by the time he remembered he was hungry, the **fish** had **swum away**.

"Bye, **fish**" said **Sammy**.

Who do you think **Sammy** met next? **Jam & Jerry, the jellyfish twins!**

"Hi" said **Sammy**.

What do you think the **jellyfish** did? They **twirled their tentacles around & around** as they **swam** off into the **ocean**.

"Nice to meet you." said **Sammy**.

**Sammy** decided to float to the surface of the **ocean**, under the **sun**. When he did, he noticed some **Western gulls** sitting on a piece of driftwood.

"Hello," said **Sammy**.

What do you think the **gulls** did? They **squawked**!

"Good day to you, too!" said **Sammy**.

"Thank you!" said one of the **gulls**. "We are very tired; we have been flying all day."

"Flying? That sounds amazing!" said **Sammy**.

"It is!" said the **gull**. "We see all sorts of wonderful things here at the beach.

"Like what?" asked **Sammy**.

"Well, as we were flying over the bushes, we saw some little critters hopping around."

Can you guess what those were? **Cottontail rabbits**!

"They were **eating grass**, and as soon as I flew over them, they **hopped** and hid in their burrows in the bushes."

"How interesting," said **Sammy**.

"Next, we encountered some **brown pelicans** flying together in the sky. Their wings are huge!" said the **gull**.

"How big are they?" asked **Sammy**.

"Seven feet long!" said the **gull**. "They **flew around us in circles and then flew away down the beach**."

"Cool," said **Sammy**. "What did you see next?

"We flew over the beach and we saw these tiny little things crawling in the sand," said the **gull**.

Do you know what they were? **Sand crabs**!

"What were they doing?" asked **Sammy**.

"It looked like they were trying to eat these teeny, tiny little things that live in the ocean," said the **gull**. "Do you know what those are called? **Plankton**!"

"Oh, I know about **plankton**!" said **Sammy**. "They float around in the **ocean** and get eaten by **gray whales**."

"Well, **sand crabs** like to eat them too," said the **gull**. "Luckily for the **plankton**, they all floated away before they were eaten."

"Then, as the **sand crabs** started to look for more **plankton**, a bunch of **sandpipers** came along!" said the **gull**.

"**Sandpipers**! What are those?" asked **Sammy**.

"They are birds, of course," said the **gull**. "And they love to eat **sand crabs** out of the sand. Just as they **landed on the ground, the sand crabs ran away**, so the **sandpipers** did not get any dinner. They just flew away, looking for more **sand crabs**."

"Wow!" said **Sammy**. "That sounds like a very interesting day!"

"Yes, it was" said the **gull**, and then the **gulls** flew away.

**Sammy** went back into the water and decided to take a nap. It had already been a long day, full of new friends and new faces.

## BEACH ANIMAL ART ACTIVITY

**Subject/goal:** Review beach animals
**Grades:** K - 5
**Time needed:** 10-15 minutes
**Habitat/environment:** Any, classroom or outdoor, tables recommended
**Materials:** "Beach Buddy" templates on half sheet of paper, 1 per student; pencils/ crayons /colored pencils; State Parks stickers (Junior Ranger)

### Activity:

Once you have collected all of the costumes, have the students sit down and ask them what they have learned about beach animals. After a few students have shared, ask them who their favorite beach animal or beach character is. Let a few students share and then tell them that they will now draw their favorite beach animal ("Beach Buddy") on the piece of paper provided. Hand out the template along with a drawing tool to each student.

They will get to keep these. While they are drawing, hand out the stickers and talk to the students about their favorite "beach buddy".

Conclude the activity by encouraging the students to visit a state beach again.

### Post-Visit Activities

Note: With the exception of the Jr. Ranger Program, the following activities can be conducted after the field trip to the state park in order to reinforce key concepts with in-class activities.

## California State Parks Jr. Ranger Program


Students ages 7-12 can become a Junior Ranger and come explore one of the hundreds of California State Parks.

Did you know that you can participate in the Junior Ranger program at any state park just by using the Junior Ranger Adventure Guide?

Just print the guide before you come and then go through the activities when you get to the park (or you even after you get home). The guide is available in English or Spanish. It's easy and fun!

Visit **http://www.parks.ca.gov/?page_id=24064** to print out your guide.

## DISCOVERY CENTER

This activity was developed for the Discovery Center at Chino Hills State Park. The model can be modified to highlight features of the visitor center or other venue in your park.

**Subject/goal:** Biodiversity
**Grades:** 2 – 8
**Time needed:** 20-30 minutes
**Habitat/environment:** visitor center with a view
**Materials:** none

### Activity:

#### Station 1: Overlook window

- Just from looking around you and looking out the window on your drive in, can anyone tell me why you think this park might be important?
- One of the reasons it is so important is because it has a lot of open space. Why do you think that would be special?
- Open space supports healthy wildlife and plant communities in one of the most biologically diverse areas in the world.
- What does it mean to be diverse? Why would that be special?
- This is what California looked like before we had our big cities and freeways. What do you think about when you look out and see the mountains and plants?
- It's secluded, protected, and still safe for animals and plants to grow
- Without city noises and buildings blocking your view, you can see animal movements, hear them in the bushes, and smell the plants.

### Station 2: Animal habitat map

- This map gives us an idea of what animals might be in the park today. Can anyone tell me where we are right now?
- Talk about where different animals might be and who is closest to us in the center.
- Discuss why certain animals have larger habitats, why some overlap.

### Station 3: Urban living wall

- What does it mean to live in an urban neighborhood?
- Does anyone have any pets? Have you ever seen an animal that wasn't your pet in your neighborhood? How can you help protect both of those groups of animals?

Review things we've talked about: Name three things from each station visited.

## BIODIVERSITY

**Subject/goal:** Observation skills development
**Grades:** 3-8
**Time needed:** 30 - 45 minutes
**Habitat/environment:** Outdoors
**Materials:** prepared handouts (maps, lists), props, binoculars

### Activity:

Introduction: Welcome the students and talk about the park, habitats, and biological diversity:

Hello everyone and welcome to _____ State Park. This park is a natural area that has many rolling hills and canyons. We call this open space. Because of the park varied terrain, microclimates, soil types and water distribution, it can support many different types of habitats.

### Can anyone tell me what a habitat is?

A habitat is a like a shelter or home in a neighborhood. These habitats provide food, water, shelter and space for plants and animals to live.

Because of their many habitats, parks provide homes for very large numbers of different kinds of plants and animals.

### Can anyone tell me a word that describes all of this plant and animal life?

We call this biodiversity. Bio means life. Diversity means different. Biodiversity means different kinds of life. Different state parks have different kinds of plants and animals.

Big open space parks provide many different habitats which support more biodiversity.

Observing all of this biodiversity can be a lot of fun. What I would like to do today is teach you a few skills that will help you learn how to observe and identify some of the plants and animals (including bugs) that you can find in an open space area.

### Sight

[Note: Use trash can and nest as props.]

Since most of your observation will done using your eyes, one of the best tools you can carry with you is a pair of binoculars. Binoculars will help you see things better by making them bigger and showing you colors more clearly. You will get a chance to practice using binoculars in a few minutes. Now, using just our eyes, let's take a look around the deck.

Do you see any signs or traces that an animal lives nearby? What do you see on top of this trash can? These are bird droppings (bird poop) on top of this trash can.

What does that tell us? It tells us that there is a bird living nearby and that he likes to sit in this tree. (Note: Move towards nest.)

Do you see anything else? Is there something above my head? This is a bird's nest.

What can you tell me about a nest? This nest is where a bird raised its babies.

### Sound

Another useful skill is learning to listen for animal sounds. This can be very useful for identifying birds because different birds make different sounds. When you're at home and you hear your father or your mother call you from another room, you know who's talking because you know the sound of their voice. With practice you can also learn how to recognize the different birds by the different sounds they make.

[Note: Pause to listen for birds if present (bird-dependent)]

### Smell

Sometimes you can use your nose to identify plants and animals by their smell. Some plants, like the sages, have a strong scent. Other plants may have flowers that have a sweet scent.

Now, does anyone know any animals that have a strong scent? Have you ever smelled a skunk? That's an animal with a very strong scent! If you smell a skunk, you don't have to see it to know it's a skunk.

### More skills

Here are a few more skills that can be useful for observing nature:

- Try to be as quiet as possible
- Move slowly
- Do not wear bright colors
- Be patient

### Nature walk

Now let's go practice a few of these skills.

How many of you have used binoculars before? – raise your hands.

What did you see? [Note: Discuss and note]

Before we practice with binoculars let me show you how to use them.

When you pick up a pair of binoculars I would like you to:

- Place the strap around your neck, so they don't fall on the ground.
- Hold them with the black rubber eyecups near your eyes [Note: demonstrate]
- Adjust the eye width [Note: Demonstrate]
- If you need to adjust the focus, first turn this dial to focus your left eye, then adjust the right eyecup to focus your right eye [Note: demonstrate]

(If you do not have enough pairs of binoculars for everyone have the students pick a partner to share with.)

First let's walk out onto the edge of the deck (vista, meadow, lake, etc.)

Can you to tell me what that sign says — the one near _____?

Let's walk over to the table and carefully pick up a pair of binoculars.

[Note: Printed sign set up ahead of time.]
1) Try to read target without binoculars. 2) Read target using binoculars. Distance: 75'.

Now, using binoculars, can you tell me what the sign says?

"BINOCULARS HELP YOU SEE BETTER" Do they help you see better? Yes!

[Note: If time permits, **look and listen** for opportunities.]

OK, let's put the binoculars back on the table.

Next I would like to take you to smell a sagebrush plant (or whatever fragrant plant grows in your park.).

[Note: Grab checklists; head to the trail / look and listen for opportunities]

Now line up here with your partner. I want you to follow me to the sagebrush (or another appropriate plant).

When you get to the plant, gently rub your fingers on the leaves and then move aside and let the next person touch the plant. Smell your fingers. Have students gather at an appropriate gathering point, such as under a tree.

[Note: Hand out Observation Skills Checklist as they approach the gathering point.]

How many of you like the smell? How many do not like the smell? Share answers.

So what new observation skills have we learned today to help us observe and identify plants and animals?

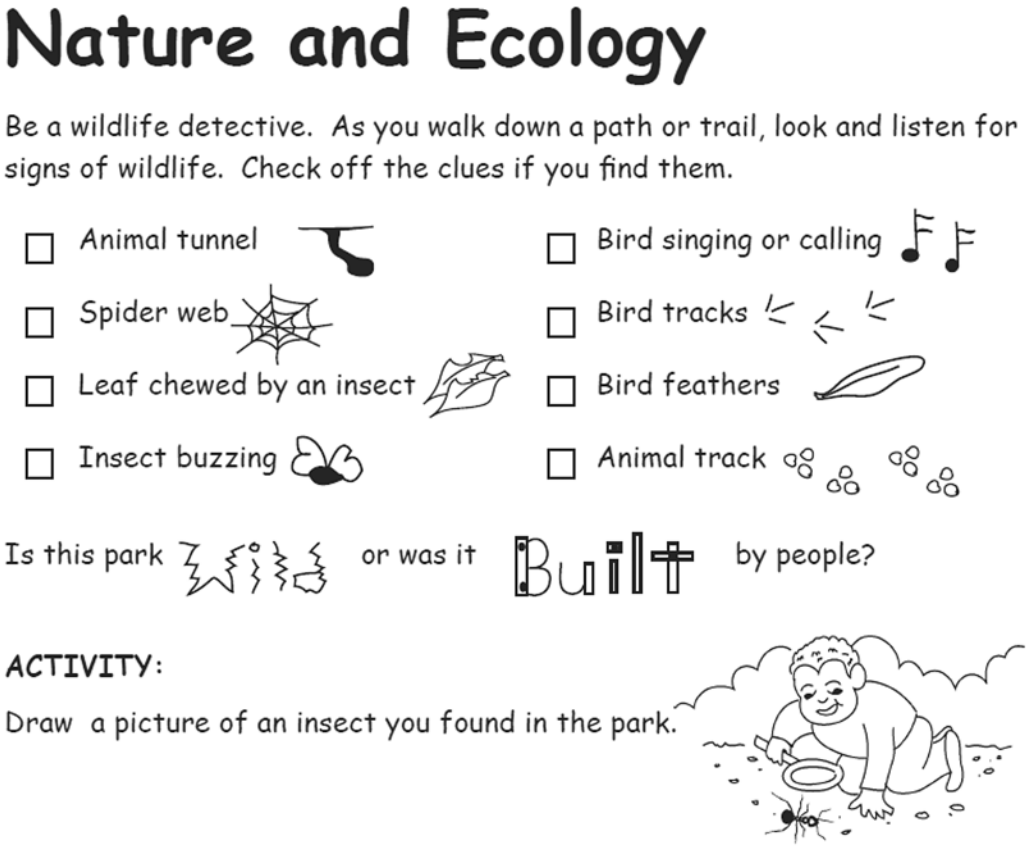
[Note: Hold up Observation Skills Checklist]

**We have learned to:**

- Bring a pair of binoculars to help you see things better.
- Look for signs and traces of wildlife – tracks, shelter, poop/scat – to help identify what animals live in the area.
- Listen – Different animals, especially birds, make different sounds.
- Smell – Some plants and animals have identifiable smells.
- Try to be as quiet as you can.
- Move slowly, so you might see animals and birds and don't scare them away.
- Do not wear bright colors, so you can blend into the surroundings better.
- Be patient.

I hope you had fun today and I really hope you will go out and use your new skills to observe plants and animals and to learn more about them. I hope you come to visit our State Park again to see some more of the plants and animals that live here. But remember that you can use these skills anywhere. You can use them at home or at the beach or in the mountains or wherever plants and animals can be found – even at name a park in their city), which is near your home.

Observing nature and biodiversity can be a lot of fun. You can start small, maybe looking closer at the butterflies and moths in your home area. You can start to look more closely at the plants in your neighborhood and listen to the local birds; try to see them and learn to recognize their sounds. You can start learning as much as you can about what you observe, so you can share it with others.




Above: This Junior Ranger Activity was used for students to explore the nature in their school yard.

## AMAZING BEAVER ADAPTATIONS

**Subject/goal:** Beavers
**Grades:** K-5
**Time needed:** 20 -30 minutes
**Habitat/environment:** Any, classroom or outdoor, preferably along trail beaver frequent.
**Materials:** Barry the Beaver (taxidermy animal), pair of small swim fins, 2 rattail combs, small can of WD-40, small can of musk deodorant, kickstand or canoe paddle blade attached to a belt, pair of "stickydot" work gloves, ear plugs or protectors, swim goggles, paper beaver teeth, beaver pelt, piece of foam pad (cut to about size of beaver pelt), belt, beaver-cut branches, picture of beaver tracks

**Background:**

Beavers, the largest North American rodents, are found along streams, ponds, and lakes throughout most of the United States and Canada. In California, beavers live in mountains and canyons. Their habitat ranges from small creeks to large rivers to wetlands. Beavers are herbivores. They eat the cambium layer of bark, especially of willows, cottonwoods, and aspens, as well as some green leafy vegetation. They are crepuscular, meaning that they forage most actively at dawn and dusk, when predation is less likely. They are rather clumsy on land, but they are excellent swimmers. When beavers dive, their heart and metabolic rates slow down, allowing them to stay underwater for up to 15 minutes.

In wetlands and along small streams, beavers build stick-and-mud dams and lodges, often significantly altering the environment in the process. On larger, swifter streams, such as the Colorado River, dam construction is impossible. Instead, they burrow out bank dens, holes several feet long and about 18 inches in diameter. The holes are underwater except when the river is low. The dens slant uphill to dry living ledges. Beavers have numerous physical adaptations to this unusual lifestyle.

## Activity:

1) Show the students "Barry" the beaver and find out what students know about them. Briefly discuss beaver diet and lifestyle, clarifying that beavers are herbivores and do not eat fish. Explain that beavers live on rivers and creeks and live in holes in the banks rather than lodges. Discuss the beaver signs that students may be able to find along a river (i.e. fresh-cut trees with ridges left by beaver teeth, tracks and tail-drag marks, branch drag marks, slide marks where beaver entered the river, piles of cut branches and logs in shallow water, scat (usually in shallow water), and holes in the riverbank if the river is low).
2) Examine beaver-cut branches, and have students feel the ridges. Show pictures of tracks if you don't see any.
3) Discuss a few activities (behavioral adaptations) of beavers. Then choose a student volunteer to model a beaver's special parts (physical adaptations). Dress the student from the feet up with objects representing its various adaptations, explaining the adaptations as you go:

- Feet: Swim fins represent webbed hind feet for swimming.
- Feet: Rattail combs represent split claw (second claw of each foot) for grooming.
- Tail: A canoe paddle (attached by belt) represents the use of the tail as a rudder in swimming. Alternatively, a kickstand can represent the tail function of holding the beaver upright while it is gnawing on a tree. Beavers do not use their tails for patting mud (except in cartoons), but they do slap them on the water surface to make a loud noise that serves as a warning device.
- Fur: Use a pelt tucked under the belt to represent the beaver's coat. A beaver's coat consists of guard hair with a soft underfur. It provides insulation as well as a waterproof layer, thanks to the oil provided by an oil gland.
- Fat layer: Use a layer of foam tucked under the pelt to represent an insulating fat layer that keeps the beaver warm while swimming in cold water.
- Oil gland: Insert the WD-40 under the belt near the base of the tail. This represents the gland that produces oil for waterproofing the beaver's coat. Grooming with the split claw helps keep the coat oiled.
- Scent gland: Have students sniff the musk deodorant, and then insert it under the belt near the WD-40. The scent gland produces a smell for marking territory and attracting mates.
- Hands: Put on "sticky-dot" work gloves to represent the rough pads for gripping on a beaver's front feet. These feet also have long claws for digging.
- Eyes: Swim goggles represent a nictitating membrane, or clear inner eyelid, that allows beavers to protect their eyes, yet also see, while swimming. Beaver eyes are positioned near the top of their head, so they can see above water while most of their head is still underwater.
- Ears: Earplugs or protectors represent the special flaps inside beaver ears that close while they are swimming in order to keep water out.
- Mouth: Beavers have a flap at the back of their mouth that they can close to keep water out of their throat while swimming, even when they are carrying sticks in their mouth.

Finally, give the student model the paper front teeth, which represent the sharp front teeth beavers use for cutting trees and branches. These teeth grow continuously and are made up of hard brown enamel in front and softer dentin behind. Chewing on trees gives their teeth a chisel-like edge. To review, ask students to briefly describe each adaptation as you remove the objects, or have each student choose one object and describe the beaver adaptation it represents.

## RIVERS TO THE SEA

**Subject/Goal:** Where ocean water come from
**Grades:** 4 - 8
**Time needed:** 20-30 minutes
**Habitat/environment:** Any classroom or outdoor space
**Materials:** Blue cape/poncho, litter items (e.g.: plastic bottles, paper cups, plastic bags, cans, paper, foam, packaging material, etc.), Velcro
**Preparation:** Attach Velcro in various spots all over the cape/poncho and to each of the litter items (sewing was chosen for durability on the poncho, ALL glues didn't hold reliably on fabric.)

### Activity:

With all the students sitting, chose one student to wear the poncho.

Put the poncho on the student and introduce the student as "The _____ River (student's name)". Explain to the students that all rivers begin nice and clean in the mountains and all flow to the ocean.

Have the Student-River open their arms because he or she is a clean river. Talk about what happens as the river meanders is way through the city (i.e., it picks up litter).

Using each piece of litter, describe a reason why that litter ended up in the river and attach it to the Velcro on the poncho. Examples: The trash overflowed, and the wind blew the litter into the river. Someone left their empty coffee cup in the car, and it blew out and into the river. Someone thought the lid on the trashcan was on, but it wasn't. People are too lazy to pick up trash they see.

Talk about how litter and waste is bad for the marine animals in the ocean. Have the Student-River show a sad face because it's so dirty.

Explain that there are some things the students can do. Calling a volunteer up, make up a story about what this particular student did to help clean up the river, pull off a piece of litter, and hand it to the student who drops it in a bin. Continue until all litter is removed.

### Examples:

- This student made sure the lid on the trashcan was secure.
- This student picked up the coffee cup that blew out of the car.
- This student recycled his used bottles/cans.
- This student participated in a river clean-up day with her church, school, community group. (hand her several litter items)
- This student made sure his younger sibling threw his/her trash away after a picnic.
- This student stopped to pick up litter.

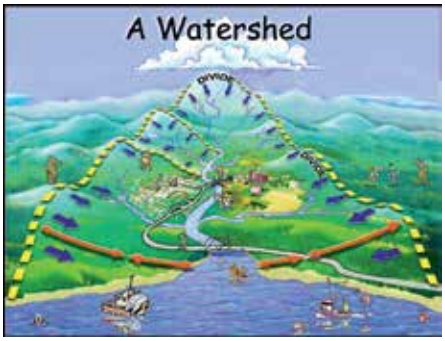
Once the Student-River's poncho is clean, the river is happy!

### Additional Helpful Tips:

- Variation: For older students, using a piece of sheer material (of appropriate color), write “oil” and “radiator fluid” on the material. Explain to students that they can’t clean liquids out of the river very well, but that they can very politely tell their adult that their car is leaking and that the oil/radiator fluid damages the river. Emphasize the fact that a lot of small puddles of oil/fluid add up. Also emphasize the fact that students can use their own judgment as to which adults are safe to talk to, such as family members and teachers, and that using “please” and “excuse me” increase the likelihood of being listened to.

## EXPLORING COASTAL WATERSHEDS

**Subject/goal:** Coastal watersheds
**Grades:** 3 - 8
**Time needed:** 30 minutes
**Habitat/environment:** outdoors in coastal area, possibly on a nature trail with a pond, lagoon or stream




| Identify one: | Answer question about it. |
|---|---|
| 1. Native plant species<br><br>Answers will vary | What role does it play in the ecosystem?<br><br>- Habitat and food for native species<br>- Primary producers of food and oxygen<br>- Prevent erosion and sedimentation<br>- Take up nutrients |
| 2. Native animal species<br><br>Answers will vary | What habitat feature does it depend on to survive?<br><br>- native plant species (maybe specific for some species)<br>- open space<br>- availability of food, water |
| 3. Non-native species<br><br>Answers will vary | Is it invasive? (Y/N) What negative impact can it have on the ecosystem?<br><br>- out-compete native species<br>- loss of habitat for native species<br>- deplete resources such as water<br>- loss of biodiversity |
| 6. Observed human impact<br>(Can be good or bad)<br>-Development<br>-Trash<br>-Degradation<br>-Educational signs<br>-Trails/preserved areas | What effect does it have on the habitat?<br><br>-Degrades the environment<br>-Takes space/food/shelter away from animals<br>-Makes plants/animals sick<br>-Helps people learn/care about the area<br>-Prevents more degradation |
| 7. Positive community action<br><br>-Creation of protected park<br>-Trails<br>-Educational signs<br>-Restoration | What positive effect does it have on the habitat?<br><br>-Protected the area from more development<br>-Provided a way for people to still interact with the ecosystem<br>-Educated people on the importance of the area<br>-Brought ecosystem back to a more natural state |

**Materials:** Picture cards of local flora and fauna; thermometer for air and water; pH strips; equipment to measure salinity, turbidity, and dissolved oxygen of water; information on acceptable water-quality measurements

**Nature Hike: Exploring Coastal Sage Scrub**

### How healthy is the water?

Air temperature _____° F _____° C Wind: _____(1= still/calm 2= breezy 3= strong)

Water Appearance

| | | | | |
|---|---|---|---|---|
| ❑ Clear | ❑ Milky | ❑ Foamy | ❑ Turbid | ❑ Oily Sheen |
| ❑ Light Brown | ❑ Dark Brown | ❑ Orange | ❑ Greenish | ❑ Other |

| TEST | WHAT THIS MEASURES | UNIT | Lagoon | Ocean or stream |
|---|---|---|---|---|
| Temperature | Measures how hot or cold water is. | ° Celsius | Will vary | Will vary |
| Salinity | How salty the water is. | ppt (parts per thousand) | Will vary | Will vary |
| Turbidity | Measures the clarity of the water. | m (meters) | Will vary | Will vary |
| pH | How acidic or basic the water is. | pH (0-14) | Will vary | Will vary |
| Dissolved Oxygen | How much oxygen is in the water. | ppm (parts per million) | Will vary | Will vary |

## Water Odor

❏ Sewage ❏ Fishy ❏ Chlorine ❏ Rotten Eggs ❏ None ❏ Other

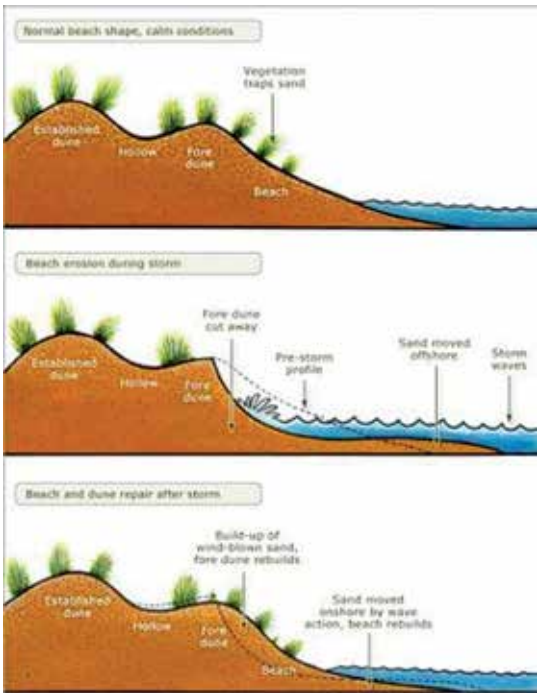
1. Would you consider the water quality to be good, fair or poor? Explain why:
Lagoon/ocean/stream: (these answers could apply for either)

- If good: testing results were within the acceptable range; observations that the water looks and/or smells clean; there is wildlife present
- If fair/poor: because measurements were over or under the acceptable range for survival of living creature, or the water looks or smells wrong.

2. Give at least 2 examples of actions that the community could take to reduce water pollution.

- Reduce urban runoff (overwatering, hosing down driveways, washing car on street.)
- Stop pollution/littering in the cities so to prevent pollution from entering the watershed.
- Clean up in the watershed or on the beach/in the lagoon.
- Keep creeks in a natural state instead of channelizing them.
- Educate others about watersheds, urban runoff, how pollution reaches the ocean and how to reduce litter and pollution.

## EXPLORING COASTAL HABITATS




**Subject/goal:** Coastal habitats
**Grades:** 3 - 8
**Time needed:** 20 -30 minutes
**Habitat/environment:** Outdoors, coastal habitat trail, preferably with dune landscape
**Materials:** none

### Activity:

Walk a coastal trail and talk about what you see. The following are potential topics and questions to discuss as you see associated sights.

- What changes has the local watershed gone through, naturally and human-caused, over time?
  - o Natural sedimentation: cobbles in the creek move down to the ocean
  - o Roadways built over creek
  - o Some development on watershed contributes runoff, pollutants
- Describe a sand dune. What is the biggest threat to this habitat along our coast?

  A sand dune is a mound, hill or ridge of sand that lies behind the part of the beach affected by tides. They are formed when windblown sand is trapped by beach grass or other stationary objects. Dune grasses anchor the dunes with their roots, holding them temporarily in place, while their leaves trap sand promoting dune expansion. Without vegetation, wind and waves regularly change the form and location of dunes.

  There are few places in southern California where one can see coastal dunes. They're all but gone, yet important avian, reptile, and plant species rely on these vanishing areas. Major threats to sand dune habitat are: construction of beachfront property, tourism, foot traffic, and removal of plant species.
- Define a wetland. Why are coastal wetlands so special and important in California?

  A wetland is a piece of land that is wet all or most of the time. Wetlands act as a filter for water, especially water that comes from a watershed. They act as a buffer zone that protects inland areas by controlling floods and buffering tsunamis. They are also important home for wildlife by serving as nurseries for marine animals and rest stops for migrating birds.
- How does the natural sand barrier affect the creek water before it reaches the ocean?

  The sand barrier slows down the water and purifies it by catching most pollutants and only letting clean water soak through to the ocean. Fine sand particles act like a giant water filter and keep pollutants like trash out of the ocean.

- Now that you know more about these coastal habitats, what can you do to help protect and/or preserve them?

Answers will vary. Could include

- Pass and enforce laws to prevent these areas from being developed.
- Prevent pollution in the cities.
- Conduct cleanups in your neighborhood and at the park.
- Habitat restoration (remove invasive plants, plant native plants)

## MARINE DEBRIS ACTIVITIES

This activity is designed to do after a beach clean-up activity.

**Subject/goal:** Recycle, reuse, and reduce trash on our beaches
**Grades:** K - 8
**Time needed:** 30-45 minutes
**Habitat/Environment:** beach
**Materials:** tennis balls, dark markers, garbage bags for collecting debris, plastic bag to simulate a jelly fish, a balloon to simulate a squid, sample of Pacific gyre patch materials, data collection cards

### Activity:

Discuss the importance of waste and recycling and how they can impact our oceans and coastal beaches. After the brief safety introduction, we then ask participants if they know the differences between a man-made item and a natural item. We use the ocean and beach as a reference to what man-made and natural items children can identify. When attendees have a general understanding of man-made vs. natural items, we then play a sensory activity where participants close their eyes and are handed either a natural or man-made item. These items range from snorkeling gear, seashells, a birds nest, plastic bag, sponge, and plastic water bottle. After the sensory activity, we then explain how waste and other items end up into the ocean.

The major theme about marine debris is discussing how plastic and other recyclable items enter and affect the ecosystem. One of these ways is through water run off after a heavy rain fall. When plastic ends up in the ocean, many marine animals and birds mistake the plastic pieces for food. We have three examples of this which are: a plastic bag jelly fish, a balloon squid, and a sample of the pacific gyre patch. The pacific gyre patch is a floating plastic 'island' in the middle of the ocean where plastic pieces and waste gather from the push and pull of the currents. These examples show how waste and plastic negatively affect marine life. This is why it is so important to recycle CRV.

Our next kinesthetic activity is where we toss around tennis balls which have various recyclable item names written on them. When the participant gets the ball, they are asked to come up with a way they can reuse the item labeled on the tennis ball and then toss

the ball to the next player. The items labeled on the tennis ball are; plastic bags, cans, plastic bottles, newspaper, cardboard boxes, caps, lids, and cartons. Participants get creative about how to keep these items out of our trash bins.

After this game we ask students to gather the items they have collected on their beach clean-up or items that are provided. They are given scales to weigh their haul in total as well as single items. Students categorize the items they've found on a data collection card. And finally they measure both big and small items and hypothesize what impact those items are making on wildlife on the beaches and in our oceans. The program concludes by extending a thank you to the program attendees for coming to learn about marine debris and we encourage everyone to ensure the protection of our clean oceans and shorelines today.

### Beach Safety:

- What do you bring to the beach? Toys, boards, food, hat, sunscreen, sunglasses, suit
- What do you bring off the beach? Trash, recycling, towels, BOTH flip flops
- Visitors on the beach: How to spot birds? Whales, Dolphins, Seals or Sea Lions?
- How would the things you leave on the beach affect the animals that live there? Food, shelter, cleanliness

### Natural or Man Made Sensory Activity:

With eyes closed, guess what items are man-made or natural items and place them in correct pile.

- Man made objects: Sponge, plastic bag, bottle, cardboard, battery, snorkel, plastic bottle topper
- Natural objects: Kelp, shells, sand, rocks, lobster tail, birds nest

**Basic Information:**
Natural items come from the Pacific Ocean and beaches
Manmade items come from where?

Top 3 items found on the beach:

- Cigarette butts
- Plastic bottle tops
- Single flip-flops

What else have you found on the beach?

**Discussion:** Single use plastics vs. multiple use vs. aluminum vs. glass

One reusable water bottle can replace anywhere from 60 – 6,000 single-use bottles!
How can you 'reuse' some items around your house?

### Kinesthetic Activity:

Preliminary activity: Group into pairs, hand each pair an item, and give the groups 30 seconds to come up with ways to reuse the item.

### Tennis Ball Game:

Utilizing the same recyclable items; now written on tennis balls, toss them around the group as quickly as possible. When each tennis ball is caught the player has to shout a way they could reuse the item. Introduce more tennis balls as the players get more comfortable.

Ask: How does trash/recycling accumulation affect us? Or the ocean?

## SAMPLE PRE-VISIT VOCABULARY LIST

**ENVIRONMENT:** The natural surroundings of an organism, which include everything, living and non-living

**HABITAT:** The place where a particular organism usually lives or grows

**CONSERVATION:** To protects something from waste or destruction

**PREDATOR:** An animal that hunts and kills other animals for food

**PREY:** An animal that is hunted or caught for food

**NOCTURNAL:** Animals that are active at night

**DIURNAL:** Animals that are active during the day

**CARNIVORE:** Animal that eats only meat (other animals)

**HERBIVORE:** Animal that eats only plants

**OMNIVORE:** Animal that eats both plants and animals

**SCAVENGER:** Animals that feeds on carrion (dead animals), dead plant material, or refuse

**ENDANGERED:** An animal in immediate danger of becoming extinct

**EXTINCT:** The complete disappearance of a species from the earth, forever

**FOOD CHAIN:** a series of types of living things in which each one uses the next lower member of the series as a source of food

**CAMOUFLAGE:** Markings on an animal's body that help it to blend in with its background

**MAMMAL:** Vertebrates that have 5 characteristics that set them apart from other animals—they breathe air, give live birth, nurse their young/drink milk when young, have hair at some point in their life, and are warm-blooded

**VENOM:** A poisonous secretion by an animal

**INCUBATE:** To sit upon eggs for the purpose of hatching them

**ECHOLOCATION:** The ability to assess the environment by emitting sound waves and listening to the echoes which bounce back to them

**FINS:** Membranous appendages of many marine animals that serve the animal in swimming, steering or maintaining balance

**FLUKES:** The two lobes of a cetacean's tail

**BLUBBER:** A layer of fatty tissue below the skin of most marine mammals

## WHO'S EGG IS THIS? MATCH THE EGG TO THE CORRECT BIRD!

A

1

Hummingbird

B

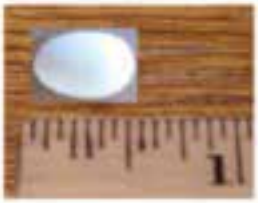
2

Mourning Dove

C

3

Great Horned Owl

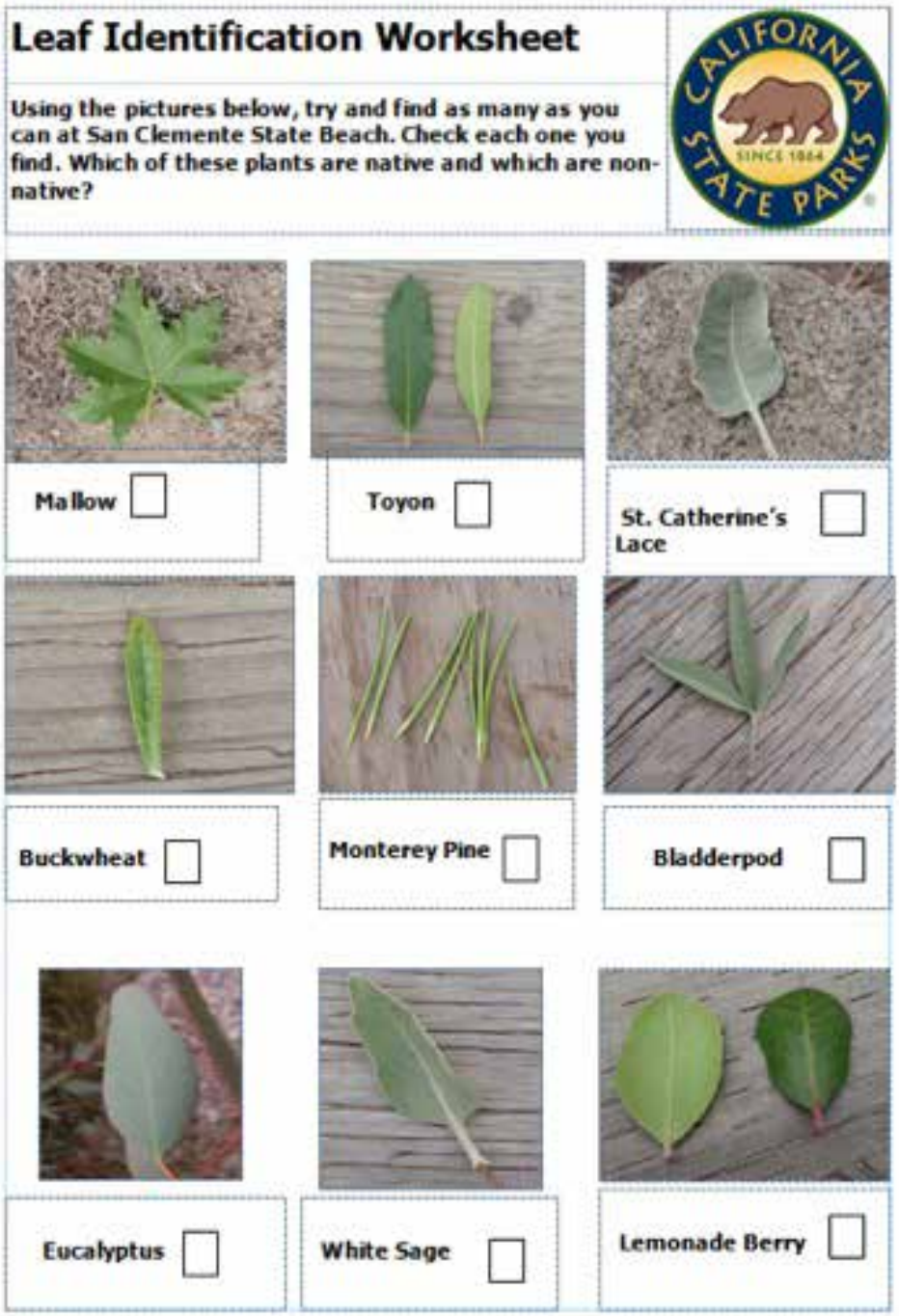


D

4

Raven

Key: A-4; B-3; C-2; D-1



## Leaf Identification Worksheet

Using the pictures below, try and find as many as you can at San Clemente State Beach. Check each one you find. Which of these plants are native and which are non-native?

Mallow ☐

Toyon ☐

St. Catherine's Lace ☐

Buckwheat ☐

Monterey Pine ☐

Bladderpod ☐

Eucalyptus ☐

White Sage ☐

Lemonade Berry ☐

This is a sample "Leaf Identification Worksheet" that can be used in conjunction with a nature hike. You can develop your own based, on the local plants in your park.

# Marine Debris

Scavenger Hunt! Collect 5 items in a row!