

# Sbnature FROM HOME

## IMAGINATION ADAPTATION A SCIENCE AND ART ACTIVITY

Best for ages 7–12, this activity can be done with 1–4 people.

### Background:

All animals have certain physical and behavioral characteristics that make them suited to their habitat (the environment where an animal lives, where they can find food and shelter). We call such characteristics adaptations. Let's think about how certain animals' physical traits help them in their habitats. Why does a giraffe have a long neck? The giraffe's neck is an adaptation that has allowed giraffes to be able to eat food from tall trees that other animals in their habitat cannot reach. Why does a tiger have orange fur with black stripes? A tiger's appearance is an adaptation that helps the animal blend into its environment, which makes it easy for them to sneak up on their prey.

In this activity, we focus specifically on bird adaptations. Not every type of habitat can sustain every type of bird. Let's learn about the types of birds that can live in the different environments of Santa Barbara: the desert, islands, and mountains. Then let's imagine some new birds adapted to our local habitats!

### Get ready:

Let's research more about the different characteristics that make birds more successful in specific environments.

- Watch this video from Cornell University that reviews the physical characteristics of a bird that play a part in what kind of food it eats, and where the bird is physically suited to survive:
  - Bird Feeding Adaptations (13 minutes): <https://www.youtube.com/watch?v=IFZ8NMBDCJw>

### Pay special attention to the following physical traits of a bird:

- Beak – size and shape determine what that bird eats.
- Wingspan – larger wingspans are typical in birds that eat other animals because they need to soar for longer periods of time in search of their food.
- Feet
  - Webbed feet are best for birds that live near the water because their feet help them to swim more easily like when people wear flippers to swim.
  - Non-webbed feet are best for birds that perch on tree branches or use their feet to capture and carry their prey.

Learn more about the different habitats in our part of California by reading the descriptions below. Research the birds that are listed in those habitats and be sure to look closely at the birds' anatomy, color, size, and eating habits.



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## Desert – Southern Sierra Desert Canyons

Deserts are very hot during the day and can be very cold at night. There are a wide variety of plants and animals that have adapted to this environment despite the harsh conditions. Many animals that live in the desert burrow underground to stay cool, but few birds do this. How can a bird escape the heat of a hot day in the desert? Birds can be nocturnally active, which means they sleep during the day and hunt food at night. However, there are still some birds that stay active during the day, so how do they stay cool? Birds are often active in the early morning and late afternoon when it is cooler.

Birds also have other neat adaptations to help beat the heat. Birds that live in the desert have high internal body temperatures (from around 104–108 degrees Fahrenheit), which keep them from overheating. Many birds also stay hydrated in this dry climate by eating moisture-rich plants and insects. Birds with tan or brown colored feathers have also adapted well to a desert environment because it helps them to blend and hide from predators. Birds like the Cactus Wren, Loggerhead Shrike, and Greater Roadrunner have unique physical characteristics that make them successful in a desert habitat.



## Island – Channel Islands

An island habitat, like that of the Channel Islands, offers food options that require swimming. What kind of feet would be best for swimming? Birds that have webbed feet are able to swim more easily to catch fish and other sea animals. Many birds that live along the shores of the Channel Islands have waterproof feathers that keep them dry. However, the Brandt's Cormorant does not, which actually helps them dive deeper in the water. That is why the Brandt's Cormorant is often seen with its wings spread out after a swim, so it can dry its feathers.

The California Brown Pelican is another bird seen on the Channel Islands. This bird is also a strong swimmer because of its webbed feet. It feeds by plunge-diving and uses its large bill to scoop up fish to eat. The Western Gull tends to forage for food on the surface of the water or on the shore and also has webbed feet. These birds tend to eat fish, crabs, squid, clams, and sea urchins, but also eat eggs from unattended nests.



## Mountain – San Emigdio Mountains

The higher elevation in mountain climates means that the weather can be much cooler here than in other habitats in Southern California. These mountain habitats can provide many different ways for birds to live and find food and water. There are many trees that provide shade, food, and shelter, and there are meadows, streams, and shrubs. The birds of this mountain habitat have different beak types compared to seabirds because of the way they must hunt and eat their food. Birds like the Golden Eagle and Peregrine Falcon have curved beaks and sharp curved talons on their feet to help catch, carry, and eat their prey.

Birds like the California Condor eat carrion (dead animals) and soar over the open rugged hills and plains to spot their food. They have a very large wingspan of up to nine feet, which helps them soar from their mountainous nests to the open lands in search for food. Birds like the Steller's Jay are dark blue, which may seem like they would not be able to hide from predators, however in their forest habitats their color helps them hide in the shadows of the trees. Their beaks are very strong and cone-shaped, which helps them crack open pine cones to eat seeds. Steller's Jays are omnivorous, which means they eat both plants and animals. What kinds of animals do you think a Steller's Jay might eat?

Some birds are found in more than one environment. Why do you think that might be? What adaptations do they have that make them successful in different environments?

**Sources:** [audubon.org](http://audubon.org), [nps.gov/chis](http://nps.gov/chis), and SBMNH docent training materials.

For more information on hundreds of types of birds and their adaptations, visit Cornell Lab of Ornithology's All About Birds at [allaboutbirds.org](http://allaboutbirds.org).

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## Activity

### Steps:

1. Choose one of the environments that you researched from the Get Ready section above (Desert, Island, or Mountain).
2. Take a blank piece of paper and fold it into quarters by first folding it in half (from top to bottom), then fold it in half again (from top to bottom).

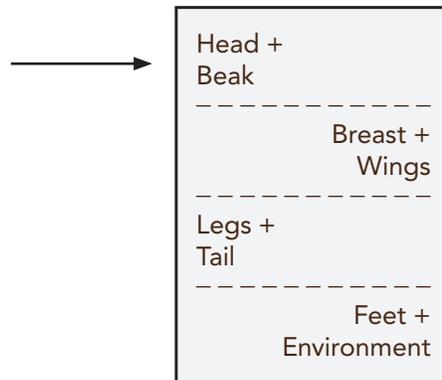
3. Unfold the paper and you should see four distinct sections. Label each section the following way:

1st (top) section – Head + Beak

2nd section – Breast + Wings

3rd section – Legs + Tail

4th (bottom) section – Feet + Environment



4. Fold up the three sections at the bottom so that you can only see the top section that says Head + Beak.
5. All participants should sit in a circle and should each have access to drawing/coloring materials.

Decide who will go first and set a timer for 2–3 minutes. (Feel free to adjust the time limit to create each section to match the age or ability of the participants.) Each person will have a few minutes to draw and color their own section of the imaginary bird they are creating. The other participants should not be watching what the person is drawing (the other participants can turn around when it is not their turn to draw). You can refer to the Helpful Tips section below to help you remember what to think about when creating your bird's features.

The first person will draw and color the top section (Head + Beak) of the imaginary bird. When their time is up, they will fold the section they just completed backward, so that no one can see what they just drew.

Repeat this step until all sections are completed, passing the paper along to the next person without letting them see what has been drawn so far.

6. Once the time is up for the last section, unfold the paper to reveal your imaginary bird! Talk together and decide if this bird would be able to survive in the chosen habitat. What adaptations would the bird need to survive?

Optional activity: Draw or color the background of this environment, providing details you learned about in the descriptions of these habitats above.

7. Want to create more imaginary birds? You can repeat all steps above and choose one of the other environments.

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## Helpful Tips

- **Head + Beak:**
  - Think about the chosen environment: what food is available and what size and shape of beak is best suited to eat that food? What color should the bird be? How big should the bird be?
- **Breast + Wings**
  - Think about the wingspan (length of the wings) as well as width and shape of the wings. Also, what color and pattern should this bird have to make it successful in its environment?
- **Legs + Tail**
  - Should the legs be long or short depending on the environment? What would this bird most likely eat, where and how would it find its prey? Also, for the tail feathers, what kind of color/pattern would be best suited to the environment? What length and shape should the tail feathers be, depending on how this bird would hunt for food?
- **Feet + Environment**
  - What type of feet would be best suited to the environment (webbed vs. non-webbed)? What kind of food would this bird eat and what kind of feet would it need to help catch or eat its food?

## What have we learned?

- ✓ Adaptations are physical and behavioral characteristics that have developed over time that help birds (and all living things) survive within their environments.
- ✓ Some bird adaptations have evolved for different environments and food choices, including:
  - Beak size and shape
  - Color and pattern
  - Length, shape, and size of wings
  - Type of feet (webbed vs. not webbed)
- ✓ You can discover these environments for yourself in your local area and see the different bird adaptations when you look closely. Many environments are represented in the Museum's Bird Habitat Hall. You can bring your imaginary birds on your next visit and compare them to the specimens shown there.