AMAZING ADAPTATIONS: *WINGS AND FEET, EYES ON THE SKIES, AND BEWILDERING BEAKS*

NOTES

AGE GROUP:
Ages 4 and up

TYPE OF PROGRAM:
Facilitated hands-on experience; Passive (self-directed stations)

ACTIVITY TIME:
10-30 minutes

Participants learn about the many adaptations birds use to survive various habitats, then get to create their own unique bird species out of art supplies.

WHAT'S THE POINT?

- Adaptations are physical and behavioral characteristics that plants and animals have that help them survive in their environment.
- Birds' feet have evolved specialized adaptations such as webbing for swimming, powerful talons for hunting, long toes for perching, and sturdy legs for wading, enabling different species to thrive in diverse habitats from forests and wetlands to open oceans and rocky cliffs.
- Birds' beaks are adapted to match the species' unique dietary needs and habitats, including sharp, hooked bills for tearing prey, long probing structures for extracting nectar or insects, sturdy conical shapes for cracking seeds, and filters for straining food from water.
- It's difficult for us to observe and appreciate one type of bird adaptation: how they see! Bird vision is incredibly sophisticated, and it's not all the same. Some birds specialize in night vision, while others excel at observing colors or detecting detail at a distance.

MATERIALS:

- Bird Adaptation Images (Wings and Feet; Bewildering Beaks; Eyes on the Sky)
- Build-A-Bird table sign with patron instructions
- Various craft supplies, such as:
  - Chenille sticks
  - Straws (to symbolize hollow bones)
  - Googly eyes
  - Markers
  - Pencils
  - Glue
  - Tape
  - Colored tissue paper
  - Puff balls
  - Craft sticks
  - Toothpicks
  - Drawing paper

PREPARATION:

- Set up a space with a table and chairs for patrons to engage in a craft activity
- Lay out craft supplies on the table
- Print and laminate the images of the birds and the table sign to display near the craft supplies

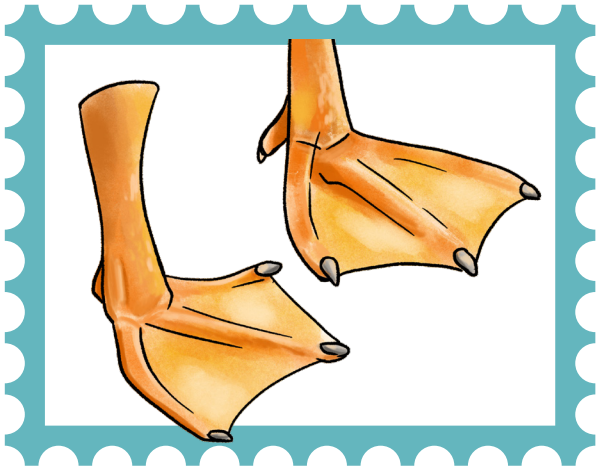
FACILITATION TIPS:

- Instruct visitors to turn and tell their neighbors what their favorite bird is. Once everyone is done, invite some pairs to share with the whole group.
- Now ask everyone to recall where they last saw that type of bird. What type of habitat was it? Was it in the forest, at the beach, or in a wetland? Did you notice any special adaptations the bird had to help it survive in that habitat, such as webbed feet or a sharp beak?
- Encourage them to look through the images of birds. What adaptations do the birds have to survive in their environment?
  - Water birds have webbed feet for swimming.
  - Shore and wetland birds have long legs for wading, and long beaks to forage deep into the sand for burrowing invertebrates.
  - Woodland birds have stout beaks for breaking seeds and nuts and short wings so they can fly through trees.
  - Birds of prey have hooked beaks, sharp claws, and keen eyesight for hunting.
  - Birds also have hollow bones that make them light enough to fly while still offering the structural support needed for their active lifestyles.
- Challenge patrons to design a bird adapted for the habitat of their choosing using the craft materials on the table. Remind them to consider what the bird will eat, where it can get water, what it will use for shelter, and how it will defend itself. They can be as creative as they like! Ask them to include one “super-sensing” adaptation, such as vision or smell, that helps the bird sense its environment.
- When they are finished, invite patrons to share their creations. Can others guess what the adaptations are? Ask them: What environment does your bird live in and how do the adaptations help it survive?

BIRD ADAPTATIONS: WINGS AND FEET!

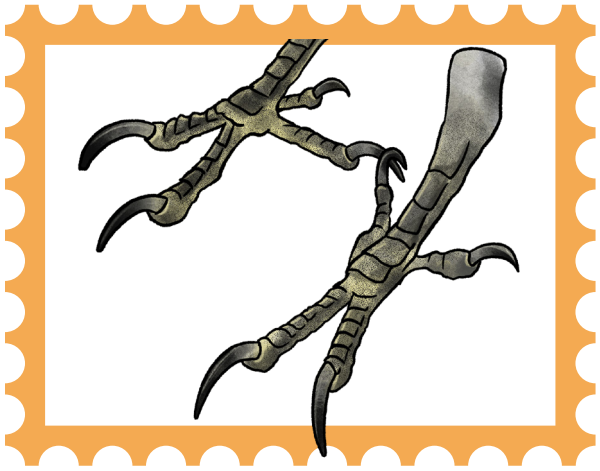
ALBATROSSES

have long and narrow wings that allow them to glide with little effort as they travel long distances during migration. They can go up to six years without touching land as they soar over vast amounts of the ocean!



MALLARDS

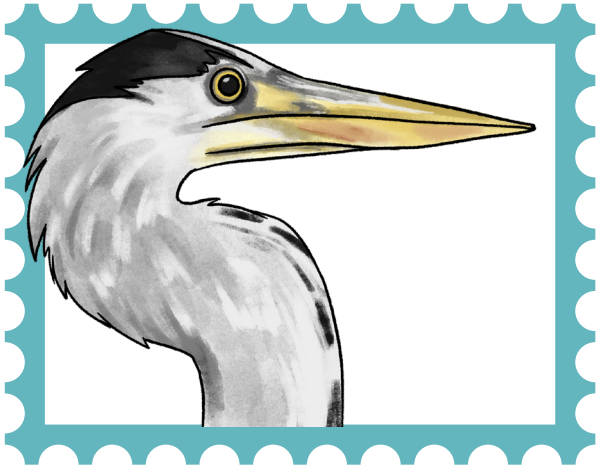
have webbed feet for swimming and can swim up to 20 mph in short bursts!



WOODPECKERS

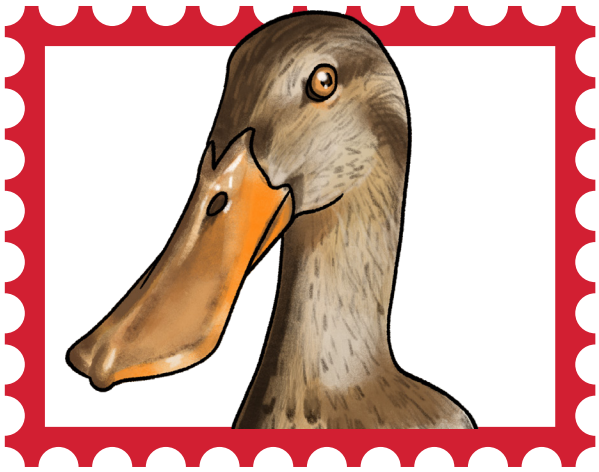
have 'zygodactyl' feet with two forward-facing toes and two backward-facing toes to grip and climb tree trunks.

BIRD ADAPTATIONS: BEWILDERING BEAKS!



GRAY HERONS

have spear-like bills for hunting and impaling slippery fish.



© Foster Wang

SHOVELER DUCKS

have long, flat bills to strain small plants from the water.

© Suzie McCann

NORTHERN CARDINALS

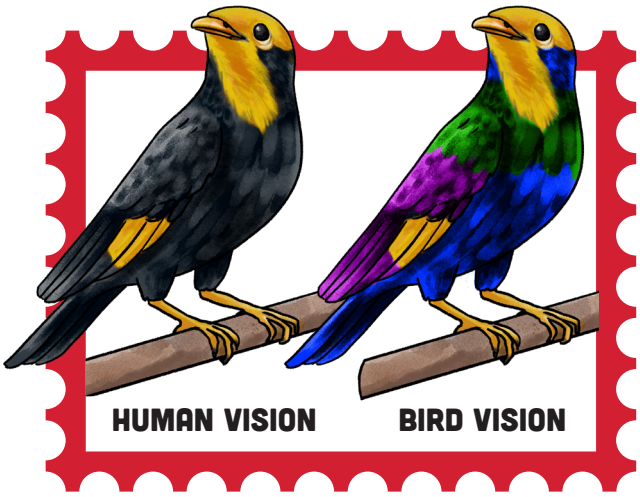
have short, strong, triangular-shaped bills that can crack open seeds.

Bird info courtesy of Cornell Lab of Ornithology; reference photos Cornell Lab | Macaulay Library

BIRD ADAPTATIONS: EYES ON THE SKY

UNDERSTANDING VISION

Birds' eyes (just like ours!) rely on light-detecting cells called **photoreceptors** to sense light and color. Photoreceptors include light-sensing cells called **rods** and color-sensing cells called **cones**. The variety and density of these cells varies between species, helping them fine-tune their sight to fit their specific needs.

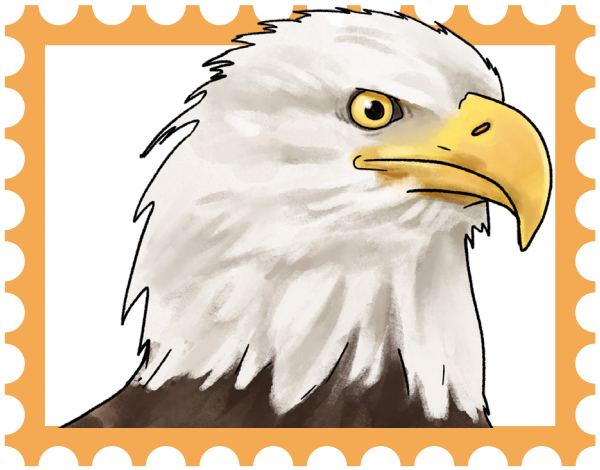


GREAT HORNED OWLS

hunt at night, so their large eyes have extra light-sensitive cells. This adaptation helps them see prey in the dark.

MANY SONGBIRDS

can see UV light thanks to a fourth variety of color-detecting cells in their eyes (humans only have three). Their enhanced color vision helps select mates and find food like insects and berries.



BALD EAGLES

Ever heard the phrase "eagle eye"? Eagles have five times the density of visual cells in their eyes as humans, allowing them to spot prey from more than a mile away — an important adaptation for hunting.

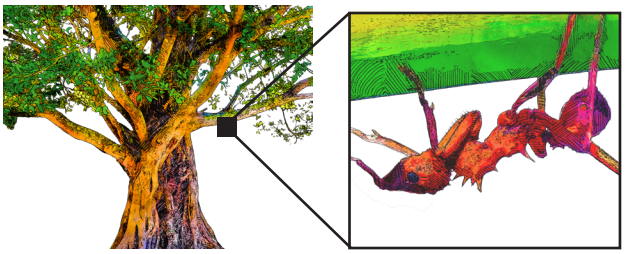


Image source: https://youtu.be/dqrtlEtrUJI?feature=shared

Bird info courtesy of Cornell Lab of Ornithology; reference photos Cornell Lab | Macaulay Library

BUILD-A-BIRD! TABLE SIGN

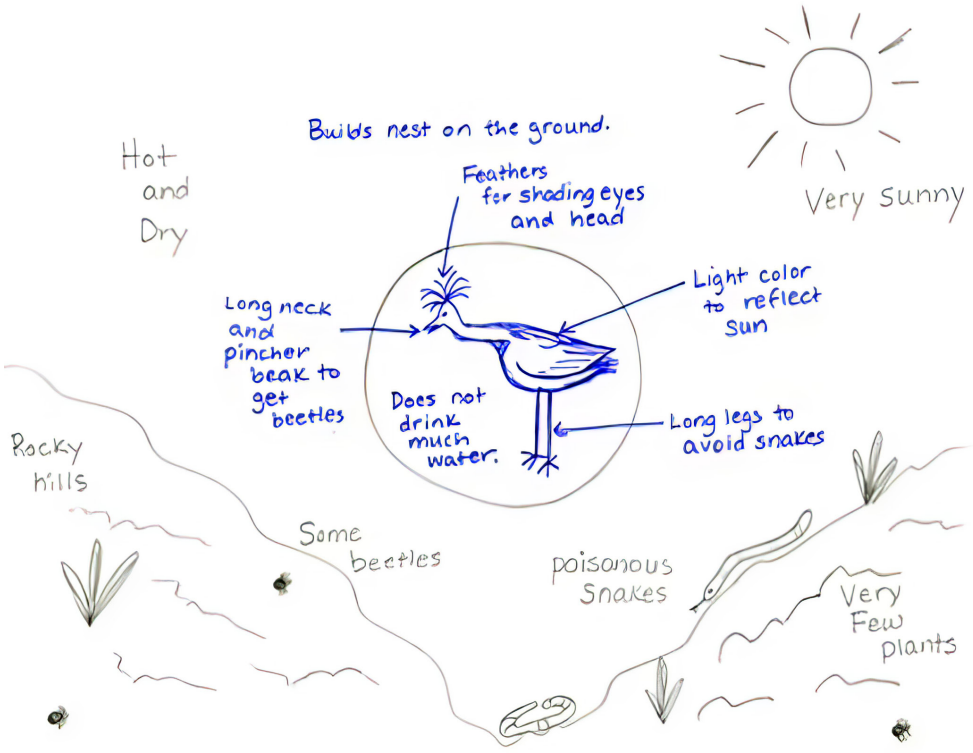


Image courtesy of https://www.birds.cornell.edu/k12/design-a-bird-challenge/

STEP 1. Choose a habitat for your bird to live in, such as a forest, near the shore, or in a pond.

STEP 2. Identify at least three adaptations that your bird has to help it survive in its habitat. Consider what the bird will eat, where it can get water, what it will use for shelter, and how it will defend itself. Include one "super sensing" adaptation, such as vision, that helps your bird sense its environment!

STEP 3. Get creative! Use the art supplies to build your bird.

STEP 4. Give your bird a name!