Peninsula Humane Society & SPCA

Animal Adaptations
Bird Beak Investigation

Objectives

- Students will explain, compare, and contrast how adaptations displayed by animals enable them to survive in different environments.

Essential Questions

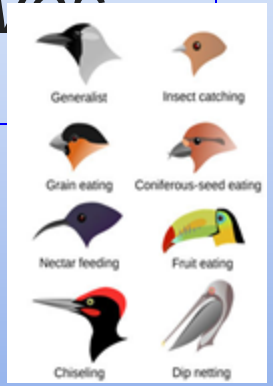
- Why do some organisms survive when the environment changes while some do not?
- What are some adaptations that allow animals to survive when their environment changes?

Animal Adaptations: *An **adaptation** is a part of an animal's body or way that an animal behaves that helps it to survive.*

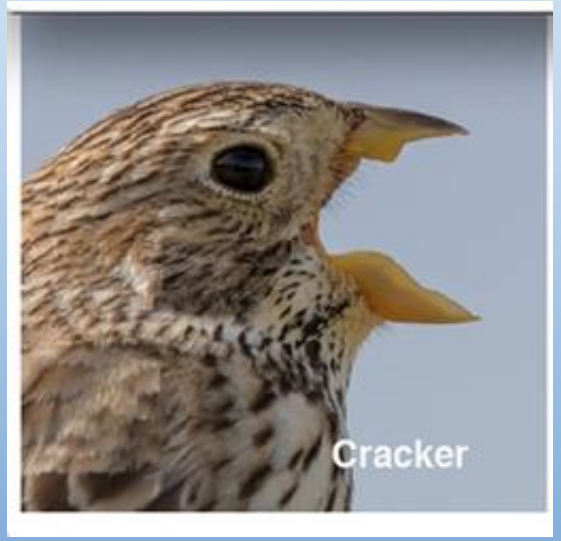
A bird's beak is used for feeding. Bird beaks have different shapes and sizes, based on a bird's diet and food sources.

A bird's specialized beak is an important adaptation.

Record what type(s) of birds have the following beak adaptations.



Seed and Nut Eaters



Short, cone shaped, strong beaks used for cracking open seeds and nuts.

Examples: sparrows, finches, cardinals

Insect Eaters

Thin, slender, pointed beaks used to pick insects off leaves, twigs, and bark

Examples: Eastern bluebird, jays, warblers, crows

Drilling Insect eaters

Strong beaks forming a sharp tip for pecking holes in trees to find insects living under tree bark.

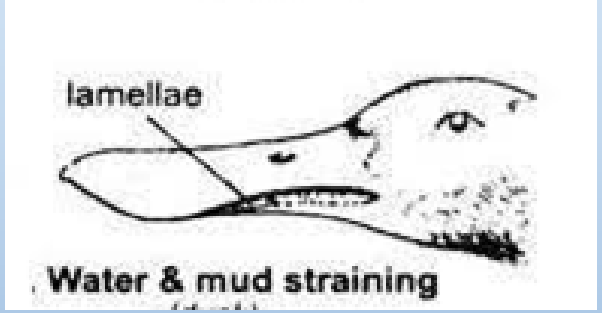
Examples: woodpeckers

Nectar Eaters

Long, tubular beaks that resemble straws, with forked tongues; the birds lap up nectar with their tongues, 15 to 20 times per second.

Examples: hummingbirds, orioles

Aquatic omnivores



Beaks (or bills) are fringed to strain plants, seeds, and small animals from mud and water.

Examples: ducks, geese, spoonbills

Aquatic carnivores

Pouch-like beaks used for scooping up fish.

Examples: pelicans, flamingos

Aquatic hunting carnivore

Fish-eating birds have spear-like beaks designed for stabbing fish.

Examples: storks, herons, egrets

Raptors (Birds of Prey)

Sharp, "hooked" beaks curved at the tip with sharp cutting edges used to tear prey into pieces small enough to swallow.

Examples: eagles, owls, hawks

Investigate: Bird Beaks

- **Work together in groups of four or more students.**
- Each person has one tool to use as a “bird beak”: spoon, tweezers, clothespin, dropper.
- **Spread all the “food items” in a tray.**

  Food items: string or yarn, erasers, beans, gummy candy
- **Label cups according to “bird beak” tools: spoon, tweezers, clothespin, dropper.**

- **Round 1: Use a stopwatch to time 30 seconds.**
  - Pick up as many pieces of string as you can using the different “bird beak” tools and place them in the appropriate cup.
  - Count the pieces of string and record your results on the table.
- **Rounds 2-4: Repeat with each food item, recording your results.**
- **Use the last row to predict what type of bird might use that type of bird beak.**

Reflect and Predict

Reflect, then answer questions:

1. What is an adaptation?
2. What is the difference between a physical adaptation and a behavioral adaptation?
3. Explain: What would happen to eagles if a disease suddenly spread throughout all the small rodents in its habitat?
4. What would be an example of a behavioral adaptation of birds?

Predict: Describe physical or behavioral adaptations of different animals.

Adaptations and Evolution, Darwin’s Finches

Read *Adaptations and Evolution, Darwin’s Finches*

Answer questions about the reading.

BONUS Video:

Galapagos Finch Evolution — HHMI BioInteractive Video, 16:08

Can you answer these Essential Questions?

- Why do some organisms survive when the environment changes while some do not?
- What are some adaptations that allow animals to survive when their environment changes?

Teacher Guide

Objective: Students will explain, compare, and contrast how adaptations enable different animal species to survive in their unique environments.

- *This is a 2-3 day Lesson Plan. The individual activities can be used together or separately.*
- *Teachers need to prepare by collecting tools that represent types of beaks (spoons, tweezers, clothespins, eye droppers), trays, cups, and materials that represent foods (pieces of string/yarn, erasers, beans/popcorn kernels, gummy candies). Students will need a stopwatch or timer.*

Activities

1. Use the slides for students **to record examples** of birds with each type of beak.
    - Seed eaters- finch, cardinals, blue jays
    - Insect eater- bluebirds, sparrows, crows
    - Drilling Insect eaters- woodpeckers, sapsuckers
    - Nectar eater- hummingbirds, sunbirds
    - Aquatic omnivore- ducks, geese, swans, spoonbills
    - Aquatic scooping carnivore- pelicans, flamingos
    - Aquatic hunting carnivore- herons, egrets
    - Raptors- eagles, owls, hawks, falcons

Teacher Guide

2. Explore

- Students work in groups of 4 or more. They use 4 types of “bird beaks” to determine what kind of food can be picked up by each beak. Each student uses one type of bird beak.
- Spread all “food items” in a tray. The 4 cups to serve as their “stomachs”.
- Use timers to time 30 seconds per round. Students record results on the table.
- Round 1:
  - ❑ Students pick up as many pieces of string as they can using “bird beaks”, placing them in the appropriate cup.
  - ❑ Students count the pieces of string and record results.
- Rounds 2-4: students repeat with each food item, recording results. Students predict what type of bird might have a beak that operates like each tool.

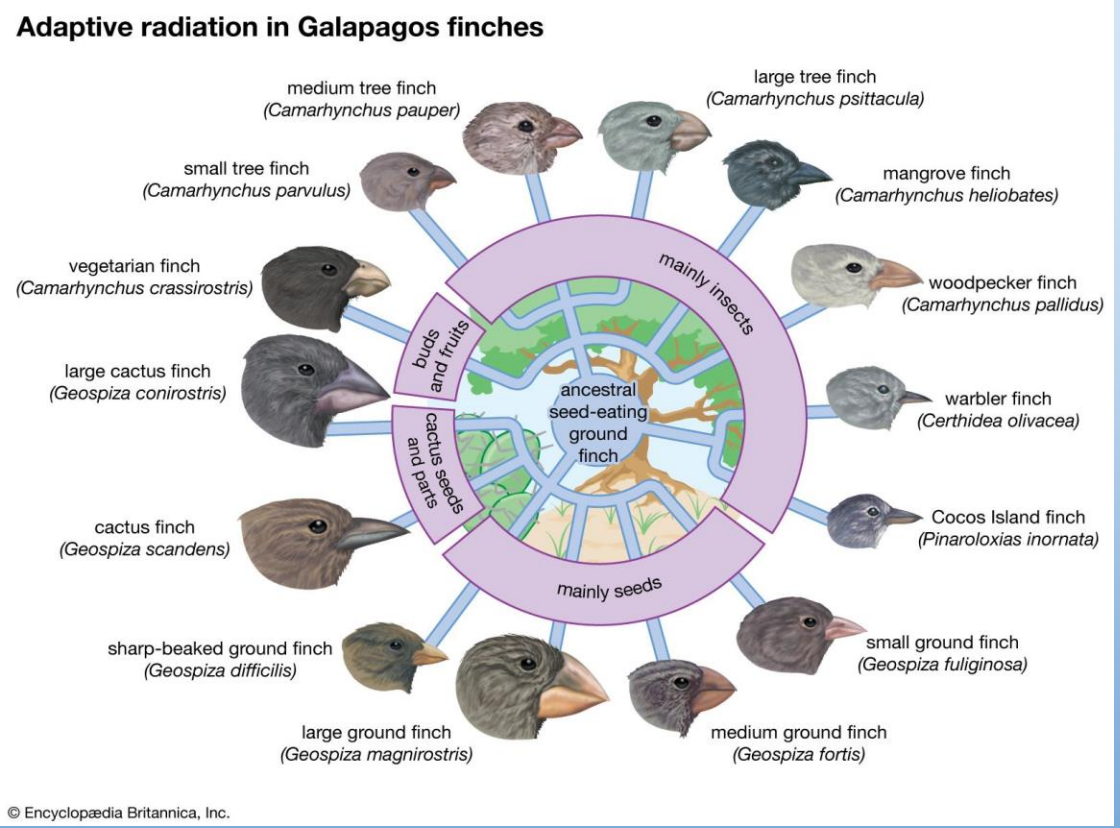
3. Reflect and Predict:

- Students answer questions and identify the various adaptations of the animals on the last page.
- Check for understanding and clarify if necessary.

4. Reading and questions:
Adaptations and Evolution, Darwin’s Finches

Adapted from Meg's Jump Drive Docs, Teachers Pay Teachers

Additional Visual, Adaptive radiation in Galapagos Finches



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