THE DALLAS WORLD AQUARIUM

Pre-Field Trip Lesson Plan: Amazing Animal Adaptations and Bird Beaks

Goal: Students will gain an understanding of what adaptations are and how adaptations help animals survive within their environments.

Objectives:

1. Students will be able to, in their own words, provide an accurate explanation of what an adaptation is and why adaptations are important for animals to survive.

2. Students will experience the benefits and challenges of bird beak adaptations for different food items.

Science TEKS:

Kindergarten – K.3.B, K.3.C, K.13.B

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and

(C) listen actively to others' explanations to identify important evidence and engage respectfully in scientific discussion.

(13) Organisms and environments. The student knows that organisms resemble their parents and have structures and undergo processes that help them interact and survive within their environments. The student is expected to:

(B) identify the different structures that animals have that allow them to interact with their environment such as seeing, hearing, moving, and grasping objects.

1st Grade – 1.3.B, 1.3.C, 1.13.A

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and
(C) listen actively to others' explanations to identify important evidence and engage respectfully in scientific discussion.

(13) Organisms and environments. The student knows that organisms resemble their parents and have structures and undergo processes that help them interact and survive within their environments. The student is expected to:

(A) identify the external structures of different animals and compare how those structures help different animals live, move, and meet basic needs for survival.

2nd Grade – 2.3.B, 2.3.C, 2.13.B

(3) Scientific and engineering practices. The student develops evidence-based explanations and communicates findings, conclusions, and proposed solutions. The student is expected to:

(B) communicate explanations and solutions individually and collaboratively in a variety of settings and formats; and
(C) listen actively to others' explanations to identify important evidence and engage respectfully in scientific discussion.

(13) Organisms and environments. The student knows that organisms have structures and undergo processes that help them interact and survive within their environments. The student is expected to:

(B) record and compare how the structures and behaviors of animals help them find and take in food, water, and air.

Materials:

Beaks*:
- Tablespoons
- Salad tongs
- Clothespins
- Toothpicks
- Pliers

Food Items*:
- Marbles
- Uncooked macaroni
- Rubber bands
- Gummy worms
- Crayons

Support Materials:
- Paper plates (Large)
- Tote bags
- Pencils

Worksheets:
- Different Bird Beaks at the Dallas World Aquarium sheet
- Bird Beak Data Worksheet

**Similar items can be substituted if those listed above are not available.*

Setup:

1. Arrange student desks into groups of five.

2. Gather items that will serve as bird beaks. Obtain one tote bag for each desk grouping and place one of each beak type into each of the tote bags.

3. Set out five plates. Place a pile of marbles on one plate. Then, place piles of each of the remaining food items (uncooked macaroni, rubber bands, gummy worms, and crayons) on each of the four remaining plates. Repeat for each of the desk groupings.

4. Count out enough paper plates so there is one for each student.

5. Place the food item plates and the other paper plates aside until it is time to start the activity.

Introduction/ Background:

1. In preparation for our field trip to the Dallas World Aquarium, we are going to learn how animals can live in many different places around the world and in many different environments.

2. The special things about animals that allow them to live where they live are called ADAPTATIONS. Different animals have different adaptations because they live in very different places.

3. Ask the students to share examples of animals that live in each of the following environments:

- Cold places with lots of ice and snow.
  Examples include penguins, seals, and polar bears.
- Tropical places rainforests, and plants.
  Examples include insects, sloths, snakes, birds, and monkeys.
- Dry, hot, sandy places with no shade.
  Examples include lizards, snakes, and moles.
- Rivers and oceans.
  Examples include fish, sharks, whales, otters, and manatees.
- Places like where we live.
  Examples might include deer, insects, birds, snakes, and rabbits.

4. Next, ask the students to share their answers to the following:

- Would a shark be able to live in a tree? Why or why not? Where does a shark belong? Why?

  Example answer: Sharks belong in the ocean. They have sleek bodies that allow them to move through water swiftly and gills that allow them to breathe underwater. Their tails help them move quickly and their fins help them steer and change directions.

  Adaptations: Gills for breathing, body shape to move easily, fins.

- Would a lion be able to live in the ocean? Why or why not? Where does a lion belong? Why?

  Example answer: Lions can swim, but not very well. Lions belong on land. Their muscular bodies are made for speed. Their claws and teeth help them catch and grab their prey. Their fur keeps them warm.

  Adaptations: Body shape and muscles for speed, claws, fur for warmth.

- Would a bird be able to live underground? Why or why not? Where does a bird belong? Why?

  Example answer: Birds mostly live in trees and in the sky. They have wings and feathers that allow them to fly. They have beaks that help them grab their food and build nests. They have special feet that allow them to hold onto tree branches.

  Adaptations: Wings/feathers for flight, beaks, feet for grasping.

5. Explain that each of these animals has different adaptations that allow them to live where they live. It is amazing that animals around the world can live in very different environments. Their adaptations make it possible for them to do this.

6. Some adaptations allow animals to hide. Their colors blend into the environment around them. This is called CAMOUFLAGE. Camouflage can help an animal hide from a predator.

7. Some adaptations make animals very easy to see. Their colors are very bright and stand out to other animals. This can be a way for an animal to find a mate. Being bright and easy to see can help birds find each other.

8. When we go to the Dallas World Aquarium, you will see many animals with different adaptations. For example, you will see a lot of beautiful birds. Some of these birds are big, some are small. Some have bright colors and others blend into their environment. Most fly, but a few do not.

9. One thing you will notice is that different birds have very different beaks. Some are short, some are long and pointy. Some are very large. Some have a hook on the end, others do not.

10. Share the "Different Bird Beaks at the Dallas World Aquarium" sheet on the Smartboard. Explain that beak shape is a great example of an adaptation. Different beaks allow birds to eat different kinds of food. Some birds eat fruit. Some eat meat. Some eat seeds. Others drink nectar.

11. To give you an idea of how beak adaptations help birds to eat the food in their respective habitats, we are going to do an activity.

Directions:

1. Give each student a paper plate and place the five plates with food items in the center of each desk grouping. Tell the students not to touch anything for now.

2. Explain to the students that the paper plate represents their "stomach", and that the items located on the tray represent food.

3. Explain that each student will receive and use an object that serves as a bird beak to gather food. Different students will have different items, each representing a different kind of bird beak.

4. Tell the students that they will take turns trying their beak on each of the food items. The goal is to obtain food and drop it onto the paper plate stomach. Explain that they can only use one hand to operate their beak. The other hand must go behind the back. They will have only 15 seconds for each food item.

5. Hand a tote bag containing beaks to one student in each desk grouping. Have that student reach inside and pick a beak, then pass the bag to the student on the right. Repeat the process until each student has a beak.

6. Distribute a Bird Beak Data Worksheet to each student. Ask them to circle the beak with which they will be working on the sheet.

6. Ask each student to take the food item plate closest to them (being careful not to spill) and place it behind their stomach plate.

7. Tell the students that when you say "start", they will have 20 seconds to collect food. After 20 seconds is up, they should count the number of pieces of food on their plate, record the number on the Bird Beak Data Worksheet, then put the food items back on the food plate.

8. After the first round, ask the students to pass their food item plate to the student to their right. The process begins again and continues until each student has tried their beak on each food item.

9. Once finished, collect the paper plates and trays and place aside. Invite students to help when appropriate.

Wrap-Up/ Discussion:

1. Ask the students to look at the number of pieces they got of each food item. Have them answer the two questions at the bottom of the worksheet.

2. Ask the students about the marbles. Ask them to raise their hand if their beak was good at picking up marbles. Ask them to explain why they think their beak was good at picking up marbles.

2. Ask the students to raise their hand if their beak was not good at picking up marbles. Ask them to explain why they think their beak was not good at picking up marbles.

3. Repeat the exercise with the other food items.

4. Mention to the students that they will have an opportunity to observe lots of different kinds of beaks and other amazing animal adaptations in person during their field trip at the Dallas World Aquarium.

Assessment:

Comprehension of concepts will be evaluated through observations of student participation in lesson discussions, the activity, and accurate completion of the worksheet.

Modifications:

- To limit the spread of germs (such as the COVID-19 virus), you could have the students wear masks and gloves for the activity as they will be in close proximity to and handling objects held by other students.
- For students with motor impairment (or if using one hand to operate a "beak" is too challenging), you can allow students to use both hands.

You could also substitute objects/items that are easier to handle or allow a partner to help with beak and food manipulation.

- For students with visual impairment, you could allow the student to handle each "beak" and touch each "food" item (be careful with items that are sharp) and make predictions as to which beaks would work best with which food items.

Extension Activities:

1. Ocean Camouflage and Plant Camouflage coloring sheets –

   Some animals blend in with their environment, making it difficult for predators to find them. This helpful adaptation is called camouflage. Students use crayons, colored pencils, or markers to color one of two Dallas World Aquarium animals with excellent camouflage (leafy seadragons and sunbitterns) along with their environment. Students are encouraged to be creative with their color choices, but the goal is to ensure the animals blend into the background. *Coloring sheets included.*

2. Help the Clownfish find the Anemone maze –

   Clownfish and anemone have a wonderful relationship where they help each other to be survive and thrive in the ocean. This activity provides an opportunity to discuss the concept of mutualism while having fun with a maze. *Maze included.*