Alligators Up Close

Goals

Students carry out background research, then analyze field data on alligator diet and water salinity to infer reasons for alligator feeding behavior.

Video Overview and Background

An ecosystem consists of a community of organisms and their physical environment. All the parts of the system interact—the living parts, or biotic factors, and the nonliving parts, or abiotic factors. This activity focuses on two factors that impact alligators in their natural habitat: food resources (biotic factor) and water salinity (abiotic factor).

Alligators are adapted to fresh water and can survive in salt water for only a short time. The higher salt content causes tissue damage by pulling water from the alligator's cells. Water tends to move across membranes from areas of low concentration to areas of higher concentration. This process is called osmosis.

Prerequisite Concepts

Before viewing the video, students should have a basic understanding of food webs, ecosystems, and limiting factors.

Teaching Tips

Activity 1—Background Research

Video segment: 00:00–02:26

Preparation Gather information sources about mangrove estuaries. Students will need to find information about estuary inhabitants, including alligators, and what they eat.

Web Search Keywords food chain, food web, Everglades estuary, alligator diet

Discussion Question

- **What do you think the video project will be about?**
- **What is different about an estuary?**
- **What are some key details that Dr. Mike mentioned?**

Completing the Student Page

Model a simple food chain for students. Remind them that the arrows indicate the direction of energy flow: sun ⇒ oak tree ⇒ squirrel ⇒ hawk

Explain that a food web shows the food chains in an ecosystem and how they're related.

Activity 2—Alligator Food

Video segment: 02:31–08:01

Preparation The video includes images of alligator stomach contents. You may wish to warn students and encourage respectful classroom behavior.

Discussion Questions

- **How does the team work together to capture and study the alligators?**
- **What alligator adaptations are mentioned in the video?**
- **When did the alligator eat and how did the team know?**

Completing the Student Page

If students are having difficulty, demonstrate how to use tally marks to complete one of the rows in Table 2.

Activity 3—Alligators and Salinity

Video segment: 08:06–10:57

Preparation In the video, salinity is measured in parts per thousand (ppt). Explain to students that this is a ratio that can also be written in fraction or decimal form: 15 ppt is 15/1000 or 0.015.

Discussion Questions

- **Why did the team need transmitter data in addition to capturing alligators?**
- **What natural events might affect the salinity of water in the estuary?**

Completing the Student Page

Students can complete a simple bar graph to illustrate the data in Table 3.

Student Page Answers

Activity 1

1. Alligators eat fish, snakes, turtles, birds, and mammals. They probably eat fish in the estuary because fish are common.

2. Food webs will vary. All should include the sun, at least one producer, and at least two consumers other than alligators.

Activity 2

Table 2: 8 crab, 3 small fish, 1 big fish, 1 snail, 1 bird, 1 mammal (hair), 1 reptile (turtle)

1. Students graphs should match the table.

2. Crabs; they were found in the most stomachs.

3. Based only on their Internet research, this probably is not what students expected. In other ecosystems, alligators eat reptiles, mammals, turtles, birds, and fish.

Activity 3

1. They should spend most of their time in the mid-estuary and up-river because the salinities are less than 15 ppt.

2. They should avoid downstream because the salinities are above 15 ppt.

Table 3: Downstream 1 min, Mid-estuary 43.5 min, Up-river 55.5 min

3. If the hypotheses are based on the data given to the students they will find that their hypotheses are supported—alligators spend their time where the salinity is low.

Activity 4

1. The salinity will decrease because rain is fresh water and it will dilute the salt. When it rains, more fresh water flows into the Shark River from upstream.

2. The students should predict that alligators will start to use waters closer to the ocean because there is food there and the salinity will be low enough for alligators to survive.

3. Bad; alligators will lose habitat due to higher salinity levels further upstream.

4. Good; alligators will gain habitat.