The Sea Turtles of Shark Bay

Goals

Students observe the adaptations of two sea turtle species, use graphs to compare physical traits of turtles, and analyze data on shark attacks on turtles.

Video Overview and Background

Shark Bay is a large, shallow, sheltered bay on the west coast of Australia. It has the largest seagrass beds in the world. The beds and surrounding waters are home to a wide variety of life including turtles, sharks, rays, dolphins, dugongs (sea cows), and numerous bird species. Because of its remote location and inhospitable climate, its ecosystem is relatively untouched by people.

Green sea turtles are named for the color of their body fat. Adult turtles are herbivores and feed almost exclusively on seagrass and algae. Their shells are dark brown and mottled; their plastron (underside) is yellow. Green turtles spend most of their time in shallow coastal waters.

Loggerhead turtles are named for their large heads. Adult turtles are almost entirely carnivorous. Their strong jaws are ideal for crushing shellfish and crustaceans. They also feed on other invertebrates such as jellyfish. Adults are usually reddish brown with a pale yellow plastron.

Sea turtles are common prey of **tiger sharks** along with fish, birds, and sea mammals. Both turtle species also face population declines due to habitat loss and hunting. Several countries have enacted laws to protect turtles and their breeding grounds.

Prerequisite Concepts

Students should have a general understanding of adaptations and predator–prey relationships.

Teaching Tips

Preview the video and identify time codes where you wish to pause and give students a chance to record more detailed observations or answer questions.

Activity 1—Making Observations

Video segment: 00:00–2:49

Preparation The video shows the location of Shark Bay. You may wish to have students also locate it on a globe or world map. Prepare copies of the worksheet pages for students to use. You may wish to provide other turtle images.

Web Search Keywords Shark Bay, loggerhead turtle, green sea turtle, tiger shark

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Discussion Questions

- **Why are seagrass pastures important?**
- **Based on the images shown, what other animals has Dr. Mike studied?**
- **What makes Shark Bay unique?**

Completing the Student Page

Students compare adaptations of the two turtle species. Images are provided on the student worksheet. The video also includes close-up views of turtles at 2:23, 4:19-4:26, and 7:04. Remind students that a physical adaptation is any body feature that helps an organism survive and reproduce in its habitat.

Activity 2—Making Measurements and Developing Hypotheses

Video segment: 2:54–8:08

Discussion Questions

- **Why doesn't the team just swim to catch the turtles?**
- **Why do you think green turtles are harder to catch?**
- **Why do you think nets aren't the best way for the team to capture turtles?**

Completing the Student Page

You may wish to have students consult Internet and library resources to add to the measurements provided on the worksheet. Students should be able to answer question 5 based on details shown and discussed in the video. Student hypotheses should be based on their observations, the data tables, and information discussed in the video.

Activity 3—Turtles and Sharks

Video segment: 08:13–10:20

Discussion Questions

- **What evidence is there of turtles being attacked?**
- **How might you verify that attacks were made by sharks?**
- **Tiger sharks mostly hunt at night. How do you think that affects turtle behavior?**

Completing the Student Page

Demonstrate how to calculate a percentage and remind students how to construct a simple circle graph. For question 3, encourage students to cite their observations as evidence to support their inferences.

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Student Page Answers

Activity 1

Table 1: Answers will vary. Adaptations—flippers, help turtle escape from predators; shell, protects from attacks; beak, helps it get food; large eyes, see prey and predators; nostrils high on nose, make it easy to breathe quickly at the surface.

Table 2: Answers will vary. Alike—shell, four flippers, big eyes. Different—green turtles are larger; loggerheads have bigger heads; green turtle front flippers are longer and wider, have one claw; loggerhead front flippers have two claws; loggerhead shell looks rougher and thicker; green turtle is dark brown; and loggerhead is reddish-brown/tan

1. The green turtle can move faster because it has wider, longer front flippers.

Activity 2

Questions 1–3: Graphs should reflect the data in Table 3. Be sure that students label the graph axes and give each graph a title.

4. Answers will vary based on the hypothesis stated above. Students may have realized that flipper size is related to swimming speed.

5. Responses should include evidence such as head size and observations of the turtle images. Students may realize that loggerhead beaks are adapted for crushing hard foods and green turtle beaks are adapted for softer foods.

6. Answers will vary. Sample hypotheses: Green turtles are safer from sharks because they're faster. Loggerheads are safer because their shells are thicker.

Activity 3

Table 5: Green Turtles—10, 1, 10%; Loggerheads—10, 5, 50%

1. Circle graphs should match the data in Table 5 shown above. Be sure that students include a graph key, label graph sections, and give each graph a title.

2. Responses will depend on students' hypotheses in Activity 2, above. The data suggest that a green turtle's faster swimming speed offers better protection from tiger shark attacks than a loggerhead's shell.

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