Ultimate Guide: Sharks: Teacher's Guide

Grade Level: 6-8 | **Curriculum Focus:** Animals | **Lesson Duration:** Two class periods

Program Description

This master reference film dares you to go head-to-head with rarely filmed bottom-dwellers and notorious man-eaters alike. Arm yourself with expert insight on the shark's unique physiology, intricate communication, and vital role in the murky underworld.

Video Comprehension Questions

- Why do sharks go into a frenzy when they hear sounds with an irregular pattern and a frequency below 40 hertz? (*Sharks go into a frenzy because wounded fish emit sounds with the same irregular pattern and frequency. The sharks think the sounds are coming from a potential food source.*)
- What does the size of the shark's eye tell you about where it lives? (*Sharks that live in deep water have large eyes to collect more of the limited light that reaches that level. Sharks that swim in shallow water have small eyes because more light can reach them there.*)
- How do sharks replace the teeth they lose continuously throughout their lives? (*The shark's lost teeth are replaced by rotating a replacement tooth, which had been folded back into the tissue of the jaw, into the frontal position quickly after a tooth is lost. Some sharks have as many as 15 rows of replacement teeth.*)
- How do sharks keep afloat when they are heavier than sea water? (*Sharks keep afloat by swimming constantly. They also have an enlarged liver that contains an oil that is lighter than sea water and gives them lift.*)

Lesson Plan

Student Objectives

- Understand sharks exhibit a wide variety of adaptations that help them survive in their habitats.

Materials

- *Ultimate Guide: Sharks* video and VCR, or DVD and DVD player
- Research materials on sharks, including photographs and/or illustrations

- Computer with Internet access
- Index cards
- Drawing and/or modeling materials

Procedures

1. Tell the class that sharks have been around for more than 400 million years ago – long before the first dinosaurs roamed the Earth. In fact, they've changed very little in millions of years. One reason is that they have many adaptations that help them survive in their ocean habitats. Explain that they are going to work in groups to learn about the adaptations of different sharks. Some adaptations are common to all sharks, while others are unique to different kinds.
2. Divide the class into small groups. Have each team research a different kind of shark. Give them time to use the Internet, materials you have provided, or materials in the library. In their research, they should describe their shark's habitat as well as specific adaptations that help their shark survive in their particular habitat. As they research, encourage them to describe the following physical adaptations:
    a) Teeth
    Examples: thin, pointed, serrated, wedge-shaped, small, conical
    b) Body Shape
    Examples: torpedo, blunt head, long snout, head flat and rectangular
    c) Coloration
    Examples: light-colored belly, gray topside, blue topside, dark brown with spots, mottled
    d) Tail and Fins
    Examples: crescent-shaped tail, long pectoral fin, tail fin same length as body
    e) Eyes
    Examples: small, black, green
    f) Senses
    Examples: eyes, nose, hearing, lateral line organs (pick up small movements in water), ampullae (pick up electrical signals)

    Students should explain how each adaptation helps the shark survive successfully in a specific habitat.
3. Have students work in their groups to draw or make models of the shark they researched. Each adaptation should be clearly labeled.
4. Ask students to present their models. They describe the habitats where their sharks live and eat and show how their sharks' adaptive features help them survive in their habitats.

Discussion Questions

1. Discuss how each of the shark's five senses function in their search for prey.

2. Different species of sharks have unique attributes that allow them to survive in their specific habitat. Explain the usefulness of some of the adaptations described in this program. Characteristics to consider are the shark's eyes, teeth, diet, body patterns, and tails.
3. In this program sharks are called an "evolutionary hit." What does the narrator mean by that description?

Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- 3 points: Student's drawing or model clearly shows and labels several adaptations; habitat and various adaptations logically explained in presentation.
- 2 points: Student's drawing or model shows and labels some adaptations; habitat and various adaptations adequately explained in presentation.
- 1 point: Student's drawing or model shows and few adaptations; adaptations not clearly labeled; habitat and adaptation explanations lacking in logic.

Vocabulary

adapt

Definition: To make suitable or fit for a specific use or situation.

Context: Nurse sharks, on the other hand, are adapted to a much more specialized diet.

dorsal fin

Definition: The main fin located on the back of fishes and certain marine mammals.

Context: This first sight of a live specimen caught on film reveals a huge sail-like dorsal fin and body designed quite different than the usual sleek contours of sharks.

pectoral fin

Definition: Either of the anterior pair of fins attached to the pectoral girdle of fishes, corresponding to the forelimbs of higher vertebrates.

Context: But because of their streamlining, sharks' pectoral fins are less flexible and don't rotate like those of a bony fish.

serrated

Definition: Notched like the edge of a saw.

Context: The serrated and hooked teeth of a tiger shark are highly efficient shearing and tearing tools.

species

Definition: A fundamental category of taxonomic classification, consisting of related organisms capable of interbreeding.

Context: Of all these creatures, a unique 370 species are among the top links of the food chain.

Academic Standards

National Academy of Sciences

The National Science Education Standards provide guidelines for teaching science as well as a coherent vision of what it means to be scientifically literate for students in grades K-12. To view the standards, visit http://books.nap.edu.

This lesson plan addresses the following science standards:

- Life Science: Structure and function in living systems

Mid-continent Research for Education and Learning (McREL)

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K-12 Education addresses 14 content areas. To view the standards and benchmarks, visit http://www.mcrel.org/compendium/browse.asp.

This lesson plan addresses the following national standards:

- Science—Life Science: Understands relationships among organisms and their physical environment.
- Science—Life Science: Understands the structure and function of cells and organisms.
- Science—Life Science: Understands biological evolution and the diversity of life.

Support Materials

Develop custom worksheets, educational puzzles, online quizzes, and more with the free teaching tools offered on the Discoveryschool.com Web site. Create and print support materials, or save them to a Custom Classroom account for future use. To learn more, visit

- http://school.discovery.com/teachingtools/teachingtools.html

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