



Title of the Lesson: Shark Teeth Adaptations

Estimated Time: 1 class period

Standards:

S3L1. Obtain, evaluate, & communicate information about the similarities & differences between plants, animals, & habitats found within geographic regions (Blue Ridge Mtns., Piedmont, Coastal Plains, valley & Ridge, and Appalachian Plateau) of Georgia.

b. Identify external features & adaptations (camouflage, hibernation, protection, migration, mimicry) of animals to construct an explanation of how these features/adaptations allow survival in their habitat.

c. Use evidence to construct an explanation of why some organisms can thrive in one habitat & not another.

Science and Engineering Practices

Crosscutting Concepts

Asking Questions Defining Problems

Ask questions that can be investigated and predict reasonable outcomes based on patterns such as cause and effect relationships.

Patterns

Patterns can be used as evidence to support an explanation.

Analyzing and Interpreting Data

Analyze and interpret data to make sense of phenomena, using logical reasoning, mathematics, and/or computation.

Big Ideas/Enduring Understandings:

- In nature, when a genetic change occurs that helps a plant or animal to survive and reproduce, this change is called an adaptation.
- The plants and animals with favorable traits (adaptations) are more likely to survive and have babies than animals who lack these traits.
- Adaptations may involve:

Vocabulary:

Feature
Adaptation
Camouflage
Trait
Survive
Habitat

- a) a different an external feature of an animal such as camouflage, big ears, or thick fur
- b) a behavior such as hibernation for artic animals, or submissive behavior for a weaker wolf
- c) other protective improvements such as a more toxic venom for a snake or a harder shell for a turtle

Essential Questions:

- How does an organism’s features allow it live and thrive in a certain habitat?

Materials:

15-20 shark teeth per group
 Plastic storage bag
 1 ruler per group
 1 magnifying glass per group

Safety Considerations:

Be careful with the shark teeth.

Technology Integration:

If possible, have students graph their data electronically and use it to evaluate their results.

Phenomena:

In this scenario, students explore how shark teeth are adapted to help ensure that sharks are successful predators.

Engage:

Display a cool picture of a shark. Explain that sharks are one of the most highly adapted groups of animals on the planet. Sharks are truly amazing creatures. Most are active predators that eat primarily fish although the great white shark will also feed on seals and other marine animals. For millions of years, sharks have successfully adapted to their changing environment. Have students consider and then discuss how they think sharks are adapted for their environments.

Explore:

To begin this exploration, have students do a close read of the article called **Shark Teeth Adaptations** (as a more open inquiry option, you can have students complete the activity before reading the article). If it’s more appropriate, read the article to them and highlight key ideas along the way. Emphasize that, while living things can adapt immediately to changes in their environment (seeking shade on a hot sunny day), adaptations are genetic changes that occur over time when new babies are born. An adaptation may involve an external feature of

an animal such as camouflage, or thick fur, a behavior such as hibernation for arctic animals, or other traits such as the venom of a snake that helps to provide protection from its predators.

In this exploration, your job is to closely observe your collection of shark teeth fossils. Each of you should look carefully at each tooth and note how similar and different they look from each other. After observing each tooth, you should then separate them into groups based on some feature (characteristic) that you think is important. Along with shark teeth, your example may contain fragments of manta ray crusher plate, sting ray barbs, and even a shark vertebrae. While these are worth observing, we are going to focus primarily on teeth in this activity. After separating the teeth into groups, you should

- 1) Name the groups in an informative way.
- 2) Draw a representative (typical) example of a tooth from that group
- 3) Explain how you think the shape of the tooth is adapted to help the shark survive.
- 4) Measure the length of the longest tooth in each group in inches
- 5) Calculate the approximate size of the biggest from each group (by multiplying each measurement by 10).
- 6) Draw a table or graph to illustrate your results

Explain:

In groups or as a class, have students share their calculations and explanations of how the shape of the tooth is adapted for the shark's survival.

Here is an overview of the big ideas for this lesson:

- 1) In nature, when a genetic change occurs that helps a plant or animal to survive and reproduce, this change is called an **adaptation**.
- 2) The plants and animals with favorable traits (adaptations) are more likely to survive and have babies than animals who lack these traits.
- 3) Shark teeth are highly adapted and come in variety of shapes and sizes depending on what kind of prey the shark is adapted to hunt. The teeth help the sharks to survive in a tough, competitive world.
- 4) In general, adaptations may involve:
 - a) a different an external feature of an animal such as **camouflage**, big ears, or sharp teeth (sharks)
 - b) a **behavior** such as hibernation for arctic animals, or submissive behavior for a weaker wolf
 - c) other protective improvements such as a more toxic venom for a snake or a harder shell for a turtle

Elaboration:

As an extension activity, have students draw a shark body to go with one of their shark teeth. Using the estimated length of the shark and the shape of the teeth, students can infer other characteristics that may also apply to the ancient shark.

Evaluation:

As a class, have students present their data tables/graphs and explain how they think each group of teeth are adapted to promote the survival of that type of shark.

Optional: Have students write a paragraph to describe what they learned about adaptations during this exploration.

Teacher Notes:

Shark teeth fossils can be purchased cheaply in bulk from several vendors including Educational Innovations (www.teachersource.com). While this lesson focuses on how shark teeth have adapted, the teeth can also be used to focus on the characteristics and formation of fossils or the classification of (once) living organisms. The lesson also provides a great opportunity for students to make measurements and collect and analyze data.



If you focus on fossils, it is interesting to note that shark teeth are the only part of a shark's body that is made of bone and hence it is the most likely body part to become a fossil. Most of what we know about ancient extinct sharks like the giant Megalodon come from studying their fossilized teeth. The study of these ancient teeth document how sharks, like all living things, have adapted over time.

Safety Considerations:

The shark teeth can be very sharp and should be handled carefully.

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