



# Tennessee Aquarium Science Streams

Presented by



## Secrets of Survival

<b>Video Focus Question:</b> What adaptations and features do plants and animals have to help them survive in their habitat?	<b>Length of video:</b> 11 minutes 36 seconds
<p><b>Science Standards</b></p> <p>TN 3.LS1.1 Analyze the internal and external structures that aquatic and land animals and plants have to support their survival, growth, behavior, and reproduction.</p> <p>TN 3.LS4.2 Infer that plants' and animals' adaptations help them survive in land and aquatic biomes.</p> <p>NGSS 3-LS4-3 Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all. *</p> <p><i>*This video contributes to the performance expectation by helping students develop an understanding of LS4.C: Adaptation.</i></p>	
<p><b>Main Learning Goal:</b> Develop an understanding of how adaptations help an animal survive in its environment.</p>	
<p><b>Science Content Storyline</b></p> <p>Animals and plants have adaptations that help them survive in their habitats. Some animals can have different adaptations to accomplish the same task, such as staying warm or eating a particular kind of food. Observing how animals use their body parts can help humans recognize the adaptations that help them carry out their functions to survive.</p>	
<p><b>Ideal Student Response to Focus Question:</b> Animals (and plants) have adaptations that help them survive in their habitats. For example, fish have tails because they need to be able to swim. If animals live in different habitats, their adaptations will be different. Sometimes, animals that live in the same habitat can have different adaptations to do the same task, such as the beak of a hummingbird and the adaptation of a butterfly (proboscis) to drink nectar.</p>	

## Preparation

<p><b>In Advance</b></p> <ul style="list-style-type: none"> <li>• Preview the video.</li> <li>• Students should know the word “adaptation” before watching this video. The term is defined within the video as a reinforcer of already having some knowledge of this word and its definition.</li> </ul>	<p><b>Materials</b></p> <p><b>Teacher</b></p> <ul style="list-style-type: none"> <li>• Butcher paper or board for brainstorming</li> <li>• Marker or dry erase marker for brainstorming</li> <li>• Pictures of habitats, plants, and animals (optional, for extension)</li> </ul> <p><b>Student</b></p> <ul style="list-style-type: none"> <li>• Paper and writing utensil to draw and take notes during their observation time</li> </ul>
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## Key Activities and Reflection

Timestamp	Science Content Outline	Guidance to Support Students
0:22	Introduction	Play the introduction for students. Pause the video and ask students what they think the video will be about. For each answer, ask students if they can share what they heard that makes them think the video will include that idea. Accept all answers at this point. Once students have shared their ideas, resume the video.
1:41	River Otter Adaptations	Write the word “adaptation” on the board. Ask students what that term means or have them offer an example of an adaptation if they know one. Now ask students what adaptation they think helps a river otter stay warm in the water. Ask probing questions to find out more about why students think their idea would help a river otter stay warm. Accept all ideas at this point.  Continue the video and listen as the educator describes the river otter’s adaptations to staying warm in the water. Ask students to compare their ideas to the explanation from the educator. Ask the students if they were surprised by any of the adaptations the otter has to stay warm.
3:26	Consider a human technology	At timestamp 3:26 let students call out how they think humans would use the object the educator is holding.

3:54	Animals who drink nectar	<p>Ask students to brainstorm a list of animals they think might drink nectar. Ask probing questions to find out more about why students think those animals might drink nectar and how students think those animals drink the nectar. Accept all ideas at this point. If butterflies and hummingbirds are not mentioned, ask the group about these animals and add them to the list the class has created.</p> <p>Continue the video to let students hear about the adaptation butterflies have to drink nectar. Pause the video at timestamp 4:31 and ask students how they think a hummingbird drinks nectar. Is this the same or different than how a butterfly drinks nectar? Ask students why they think these two animals that both drink nectar might do it in a different way and why their adaptations would be different.</p>
5:36	Adaptations of animals that live in the Tennessee River	<p>Ask students to brainstorm adaptations they think animals that live in the Tennessee River might have. You can either do this as a class and write ideas on the board/butcher paper, as small groups, or individuals. If doing this activity in small groups or as individuals, ask students to write down their ideas, as they will need to refer back to this list of ideas in a couple minutes. Ask probing questions to find out more about why students think their idea would help an animal living in the Tennessee River. Accept all ideas at this point.</p>
6:14-7:14	Observation time	<p>Have students watch the video during the one-minute observation session. Students will observe animals in the Tennessee River exhibit to look for adaptations they have to help them live in this aquatic environment. Students should pick one animal they see to sketch and then label any adaptations they see. Ask students to make notes by any adaptations they labeled explaining how they think this adaptation helps the animal to survive in this habitat.</p>
7:26	Adaptation Review	<p>Have students compare the adaptations they labeled on their sketch with the adaptation brainstorm list they made earlier at timestamp 5:36. Were students surprised at any of the adaptations they did or did not see during the observation time? Ask students what they think the adaptations they were surprised to see or not see do for their animals in the place that they live, discussing this can help students see if a listed adaptation is something that could be seen in this habitat or if the idea is not a good fit for the habitat they are currently observing.</p>
7:45	Adaptation Comparison	<p>Have students make observations of a different animal in the video clip of the Tennessee River Exhibit and look for some of the previous listed adaptations from their sketch. Ask students to share any similarities and differences they notice.</p>

8:13-10:13	Paddlefish Observation	Here students will observe paddlefish for two minutes. Students should focus their attention on the paddlefish's mouth and how they use it. Have students write down their observations, how they think a paddlefish uses its mouth, and the evidence they observed that lead them to this theory.
10:13	Paddlefish Observation Share	After playing the video through the two-minute observation time, ask students to share their observations and thoughts about the paddlefish's mouth. For each answer, ask students if they can share what they heard that makes them think the video will include that idea. Accept all answers at this point. Once students have shared their ideas, resume the video.
10:56	Conclusion	Play the conclusion of the video to challenge students to observe animals they see and look for adaptations that might help that animal live in their habitat.

### Extension Activities

- Each of the videos in the Science Streams series has an introduction by people in different departments at the Aquarium. This offers an opportunity to talk about the many different types of jobs it takes to run an aquarium.
- Have students use evidence to construct an explanation of why some organisms can survive well in a particular habitat, some may survive less well, and others cannot survive at all.
- Have students observe an animal (in nature or by use of a live cam) and list all the adaptations they see that help that animal live in its environment. Then ask students to explain what they think each adaptation they listed does for the animal and provide evidence to support their theory.
- Play a matching game by having students match plants and animals to the habitat they think they would live in based on their physical adaptations. Ask students to provide evidence for why they chose to put certain animals or plants in certain habitats.