

Into the Outdoors

DISCUSSION GUIDE ANIMAL ADAPTATIONS



Educational Partner

GRADE LEVELS

Middle School - Grades 6-8

ENDURING KNOWLEDGE

Students should understand the history of Wisconsin's Lac du Flambeau Band of Lake Superior Chippewa Indians and how they survived harsh winter conditions while also recognizing the survival strategies of other wildlife and aquatic species that inhabit the area.

**LEARNING TARGETS:**

1. Students should know the different types of survival strategies that various species use to survive during weather extremes such as winter (migration, hibernation, adaptation, and aquatic life).
2. Students should be able to recall the survival strategies the Lac du Flambeau Band of Lake Superior Chippewa Indians utilized to survive the extreme winter conditions and adapting to seasonal changes in the Lake Superior area of Wisconsin.
3. Students should be able to compare and contrast the various types and combinations of survival strategies of the species presented in the video.



DISCUSSION GUIDE FOR VIDEO



TEACHER BACKGROUND

Migrators:

Some species, mostly birds, survive the harsh winter by migrating, or moving to a different location with a more temperate climate. Ducks abandon the harsh winter conditions by taking flight in the fall. They use land markers, the Earth's magnetic field, and an internal solar compass to help navigate their way to their distant winter destinations. The Lac du Flambeau Band of Lake Superior Chippewa Indians survived harsh winter conditions in the region for hundreds of years by using "local migrations" from one area to another to capitalize on changing seasonal food sources and other natural resources. The wild rice that grows naturally in this area is a valuable food source for Native Americans and wildlife. The Native Americans spent half of the year preparing for their winter survival. In the spring, they would harvest sweet sap and make it into maple sugar. They also harvested fish and wild rice, which were very important to their diet. In the summer, they fished, hunted deer, and gathered berries. In the fall, they harvested deer, hunted the waterfowl (ducks and geese) and gathered fruits, nuts, and fish which would carry them through the winter.

Hibernators:

Certain species survive the winter by hibernating. Chipmunks store food in their den and fall into a deep sleep called torpor. They wake only to eat and go to the bathroom. Bears are called super hibernators. They do not store food or go into deep sleep. Yet they don't eat, drink, or go to the bathroom during the winter months. They hibernate because there's no food outdoors for them to eat. Instead, they gorge on food in the fall and build a reserve of fat to carry them through the winter. This is known as hyperphagia. Bumblebees hibernate similar to bears. They find a place in the ground or a hollow log. Unlike bears however, they form a type of antifreeze in their body to prevent freezing during the winter.

TEACHER BACKGROUND *(continued)*

Adaptors:

Various species of amphibians are known as “seasonal adaptors”. Some frogs spend the winter on the bottom of a pond where they can absorb oxygen through their skin from the dissolved oxygen in the water. Tree frogs, toads and salamanders go deep underneath leaves on the forest floor to survive the winter.

Aquatic Species:

Walleyes are examples of aquatic species that can be affected by extreme weather conditions. For example, extreme winter conditions can affect the water temperature and thus the timing and successful ability of certain spawning fish. The Lac du Flambeau Tribe has a fish hatchery where they incubate fertilized eggs collected from adult walleye netted out of reservation lakes. Walleye spawn when the temperature of the water reaches 42 degrees Fahrenheit. Photoperiod is known as the amount of light that an organism is exposed over a 24 hour period. This photoperiod plays an important role in walleye spawning. Fry and fingerling walleye are raised then stocked into lakes during the spring and summer.

VOCABULARY:

- **Torpor:** The decreased physiological activity in an animal that enables them to survive periods of reduced food availability.
- **Super Hibernators:** Animals that do not store food or go into a deep sleep during the winter months. They do not eat, drink, or go to the bathroom.
- **Hyperphagia:** Gorging on food in an effort to build a reserve of fat in an effort to survive the winter.
- **Lac du Flambeau Tribe:** A nation of Native Americans living in Northern Wisconsin.
- **Photoperiod:** the amount each day organisms are exposed to light.

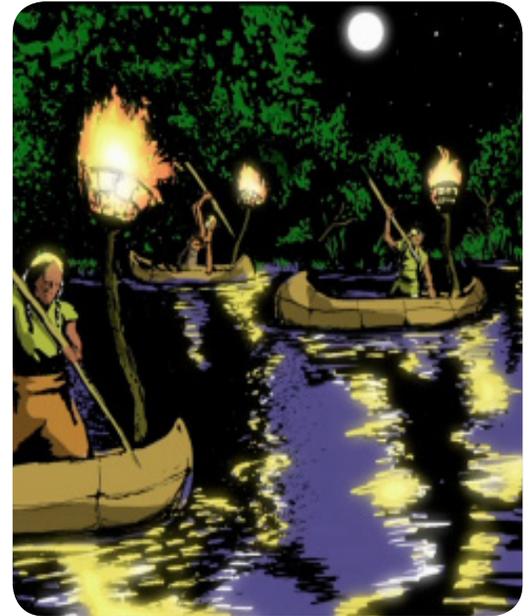
BEFORE VIEWING THE VIDEO:

Ask students how they think species survive extreme conditions. List ideas on the board or make a web. Establish student prior knowledge of the history of the Lac du Flambeau Band of Lake Superior Chippewa Indians by having a brief discussion of what students already know. If you choose, have students fill out a KWL chart. Students could fill in the K part of the chart during this time.



SPECIAL CONSIDERATIONS:

This activity is richest when completed in the classroom with discussion shared within the whole class. It may be helpful to create a guide sheet for notes with headings and questions to help guide students in picking out significant information.



VIEWING AND DISCUSSION GUIDE:

1. Tell students that as they watch the video, they should be making a list of their own questions they have. If you are using the KWL chart, students could fill in the W part of the chart. If you want student questions to be more specific, ask them to choose three species from the video and come up with questions for each species.
2. After viewing the video, review students' questions and discuss as a class. Tell students to fill in the L part of their chart during the discussion time if they find their questions were answered. Tell students to hold on to any questions they have that were not answered and they can look them up at another time.
3. Divide students into four groups: migrators, hibernators, adaptors, and aquatic species. Give students chart paper and tell them to label their group on top. Tell students to list what they know about their group after watching the video. Then ask them to list any other species they think may also have strategies that fit into their category at the bottom of the page. Group back together as a class and discuss as a whole the differences or similarities they notice among species. Another option would be to combine groups so there are two big groups. Give the groups a Venn diagram and have them pick two species from their charts to compare and contrast. Have the students consider and discuss how climate change could affect the survival strategies of the species.

ADDITIONAL CONSIDERATIONS:

1. The online video "Animal Adaptations" is presented in four separate Parts. The instructor may want to stop the video after each of the four Parts to allow students time to take notes and write down their questions.
2. Depending on class dynamics, the teacher may want to divide students into groups ahead of time for the last activity to ensure students will be successful with the activity.

STUDENT PORTION:

Charts, graphs, worksheets, Journal Pages: See Venn Diagram and KWL chart on separate page.

EVALUATION:

1. Students will be informally assessed based on their participation in the class discussions and during their group work time.
2. The teacher can collect the KWL charts and Venn Diagrams to use as a form of assessment as well.

EXTENDED LEARNING:

1. Develop a research project centered on the question "how did species evolve to develop these adaptations?" Students will need to do research on what's happened in the past relative to climate and environmental change that may have helped these species evolve. The use of the Internet, books or interviews can be used to help students find the answers to the question. Students can work in teams or individually. They can come up with their own way to present their findings (technology presentation, poster board, skit, science Smartphone movie posted to YouTube).
2. Take a field trip to the George W. Brown, Jr. Ojibwe Museum and Cultural Center in Lac du Flambeau, WI. Make a Venn diagram of cultural or subsistence lifestyle activities from the past that are still practiced today. Instructors can contact the museum to make arrangements. <http://www.lfmmuseum.com/contact-us.html>.



The following **Student Proficiency Standards** can be met by teaching **ANIMAL ADAPTATIONS**:

WISCONSIN STATE STANDARDS AND BENCHMARKS

C.8.1 Identify* questions they can investigate* using resources and equipment they have available

C.8.2 Identify* data and locate sources of information including their own records to answer the questions being investigated

C.8.3 Design and safely conduct investigations* that provide reliable quantitative or qualitative data, as appropriate, to answer their questions

C.8.5 Use accepted scientific knowledge, models*, and theories* to explain* their results and to raise further questions about their investigations*

E.8.5 Analyze the geologic and life history of the earth, including change over time, using various forms of scientific evidence

F.8.7 Understand that an organism's behavior evolves through adaptation to its environment

F.8.9 Explain how some of the changes on the earth are contributing to changes in the balance of life and affecting the survival or population growth of certain species



NATIONAL COMMON CORE STANDARDS

CCSS.ELA-LITERACY.SL.8.1 - Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 8 topics, texts, and issues, building on others' ideas and expressing their own clearly.

CCSS.ELA-LITERACY.SL.8.1.C - Pose questions that connect the ideas of several speakers and respond to others' questions and comments with relevant evidence, observations, and ideas.

CCSS.ELA-LITERACY.SL.8.1.D - Acknowledge new information expressed by others, and, when warranted, qualify or justify their own views in light of the evidence presented