Lesson Plan: Brown Bear

Summary

This lesson examines the evolution, adaptation, and conservation of the brown bear. Students explore how bears evolved from proto-bears and how speciation occurs through isolation, geography, and environmental change. The transcript discussion compares brown, black, polar, and Kodiak bears, showing how gene flow, habitat, and climate influence evolution.

https://www.youtube.com/live/K1iUugSxmG4?si=nAzgaO8G2FfMAxw_

Objective

Students will understand the evolutionary history of brown bears and describe how isolation and environmental factors cause speciation. They will analyze how media, conservation, and climate change affect bear populations today.

Standards

- NGSS MS-LS4-4: Construct an explanation based on evidence that describes how genetic variations increase survival and reproduction.
- CCSS.ELA-LITERACY.RST.6-8.3: Follow precisely a multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- C3 Framework D2.Eco.10.6-8: Explain how changes in environmental conditions influence ecosystems and populations.

Materials

- 9 Fun Facts: Brown Bear
- Worksheet: Brown Bear
- Paper, pencils, and optional bear species diagrams

Introduction

Discuss how species adapt over time and why some remain connected while others separate. Ask students to describe the differences between brown, black, and polar bears. Introduce the concept of speciation and gene flow as key processes shaping animal diversity.

Activity

Students will read the 9 Fun Facts and outline a bear family timeline from proto-bear to modern brown bear. Working in groups, they will diagram how climate and geography influence speciation and create comparison charts of different bear species. The class will then discuss how cultural portrayals affect human attitudes and conservation decisions.

Assessment

Students will complete the worksheet and participate in discussion. Evaluation is based on identifying evolutionary milestones, explaining speciation, and understanding conservation impacts.

Rubric

Criteria	Excellent (4)	Proficient (3)	Developing (2) | Beginning (1)
Understanding of Evolution	Clearly explains timeline and species relationships	Identifies most key details accurately	Lists basic facts with minimal explanation | Minimal or incorrect understanding
Application of Speciation Concepts	Accurately links isolation and adaptation	Shows general understanding	Limited or partial explanation | No understanding of connection
Cultural and Conservation Awareness	Explains how media affects wildlife perception	Mentions basic human influence	Minimal reference to culture | No mention of human impact
Participation	Contributes actively in class discussion and worksheet	Participates with some prompting	Limited participation | No participation

9 Fun Facts

1. Proto-bear and bear-apparent Between 55 and 40 million years ago, small raccoon-like carnivores began evolving into what we now recognize as bears. During the Miocene, around 20 to 10 million years ago, Ursavus, the “dawn bear,” emerged as a transitional form between doglike ancestors and true bears. Its skull and teeth already showed the omnivorous shift that would define the family.
https://a-z-animals.com/blog/whats-the-oldest-bear-fossil-ever-found/

2. Official bear and brown bear Roughly 5 million years ago, the genus Ursus stabilized into modern-style bears. The brown bear lineage split about 1.2 to 1.5 million years ago and spread rapidly across Eurasia and North America by 50 thousand years ago. Fossils show Ursus arctos first in Asia, expanding west into Europe and east across Beringia during glacial cycles.
https://domainofthebears.proboards.com/thread/903/brown-bear-evolution

3. Speciation of brown and black bears Ecological specialization divided the two species as Ice Age climates fluctuated. Brown bears dominated open tundra and alpine regions, while black bears adapted to forests where climbing and foraging provided safety. Even where their ranges overlap today, behavioral and ecological barriers prevent them from interbreeding.
https://www.nps.gov/yell/learn/nature/bear.htm

4. Lack of complete speciation between brown and polar bears Brown and polar bears diverged roughly half a million years ago but never fully separated. Repeated Ice Age connections across the Arctic allowed gene flow each time sea ice bridged their ranges. They remain distinct in form yet genetically entangled, and occasional hybrids prove that speciation is still incomplete.
https://doi.org/10.1073/pnas.1210506109

5. Kodiak bears When rising seas flooded the Bering land bridges about 12 thousand years ago, the Kodiak Archipelago cut off its resident brown bears. Since then, Ursus arctos middendorffi has lived in isolation. Gene flow with mainland grizzlies is now almost zero, but they are still fully brown bears. Abundant salmon and mild competition let them grow immense, up to 1,500 pounds, making them record holders by girth, not genetics.
https://kodiakbearcenter.com/why-kodiak-bears-are-different-to-other-bears/

6. Climate change and shifting ranges Warming climates are driving brown bears northward and higher in elevation, while polar bears are pushed even farther north or forced ashore as sea ice vanishes. The two species are moving apart rather than mixing more. Hybrids appear only at the thinning edges of their ranges, where changing seasons briefly overlap them.
https://www.nathab.com/know-before-you-go/alaska-northern-adventures/alaska/bears-and-climate-change

7. Bears in media and the shift in public perception Stories and film changed how people saw bears, turning fear into affection. Gentle Ben, Baloo from The Jungle Book, and Disney's Brother Bear and Brave helped portray bears as intelligent, sympathetic, even noble. Those portrayals softened public opinion just as modern conservation began, paving the way for protection instead of persecution.
https://thehistorypress.co.uk/article/famous-bears-in-literature/

8. The myth of the "friendly bear" Pop culture's gentle bears created a dangerous illusion. Tourists and campers sometimes approach real bears as if they were storybook characters, feeding or photographing them too closely. Once a wild bear loses its fear of people, it becomes a threat, and wildlife officers are forced to kill it, another casualty of human naivety.
https://www.scientificamerican.com/article/why-are-bears-friend-shaped/

9. Population numbers and conservation status Brown bears are no longer globally endangered, with an estimated 200,000 worldwide. That recovery followed centuries of persecution that erased them from most of Europe and the lower 48 states. Today Alaska holds more than 30,000, Canada around 25,000, and Russia over 100,000, though smaller regional populations remain fragile.
https://www.nps.gov/yell/learn/forty-years-of-grizzly-bear-recovery.htm?fullweb=1

Worksheet

Name: _____ **Date:** _____

Review

1. When did the genus Ursus first stabilize?

2. What ecological differences separate brown bears from black bears?

Discussion

3. Why have brown and polar bears not fully speciated?

4. How does isolation affect the development of Kodiak bears?

Data Analysis

5. How is climate change altering the ranges of brown and polar bears?

6. Compare the historic and modern brown bear populations. What caused the rebound?

Reflection

7. How have books and films changed public perception of bears?

8. Why is it dangerous to think of wild bears as friendly?

9. What does the recovery of brown bears tell us about conservation success?