Sea Lion Lesson Plan

Summary

In this stream, the speaker introduced a sea lion figurine and used it to explain pinniped evolution and modern conservation. He discussed how pinnipeds evolved from land-dwelling carnivores about 50 million years ago, split into three main branches 20–25 million years ago, and how modern sea lions appeared between 20,000 and 70,000 years ago. He explained the differences between seals, sea lions, and walruses, detailed their predators, diet, and pup mortality, and emphasized both natural and human threats to their survival. He also covered population changes and conservation measures that helped California sea lions rebound from near collapse.
https://www.youtube.com/live/ZKhfm0-7OTs?si=5pi8ajVqPPQeVvHl

Objective

Students will learn about the evolution, biology, predators, population trends, and conservation of sea lions. They will be able to identify differences among pinniped groups and explain the role of conservation in species recovery.

Materials

- 9 Fun Facts handout (provided)
- Worksheet (provided)
- Optional: images of sea lions, seals, and walruses; world map of sea lion ranges

Introduction

Begin by asking students if they know how to tell the difference between a seal, a sea lion, and a walrus. Write their responses on the board. Then introduce the concept of pinnipeds, meaning 'flipper-footed,' and explain that sea lions are one branch of this family.

Activity

1. Read through the 9 Fun Facts as a class.
2. Show a map of the Pacific Ocean and have students mark the ranges of the six sea lion species.
3. Compare photos of sea lions and seals to point out the ear flaps and body posture differences.
4. Discuss human impacts such as fishing nets, dogs, and climate events.
5. Have students complete the worksheet questions individually or in groups.

Assessment

• Class discussion participation
• Completed worksheet demonstrating understanding of evolution, adaptations, threats, and conservation of sea lions

Rubric

Criteria	4 - Excellent	3 - Good	2 - Fair	1 - Poor
Understanding Content	Demonstrates clear understanding of all 9 Fun Facts and concepts	Understands most concepts with minor errors	Partial understanding, some major errors	Limited understanding
Participation	Actively participates in discussion and activities	Participates with some prompting	Rare participation	No participation
Worksheet Completion	All questions answered accurately and thoroughly	Most questions answered accurately	Some questions answered	Few or no questions answered
Use of Evidence	Uses facts and examples from Fun Facts consistently	Uses some facts and examples	Limited use of facts	No evidence used

9 Fun Facts

1. **Pinnipeds trace back to land-dwelling carnivores about 50 million years ago.** Fossils like Puijila darwini show a walking-swimming interface between terrestrial carnivores and aquatic pinnipeds. This animal had webbed feet for swimming but still walked on land, making it a key transitional form. The evidence supports pinnipeds evolving from bear- and dog-line ancestors rather than rodents or mustelids.
https://www.smithsonianmag.com/science-nature/why-did-seals-and-sea-lions-never-commit-to-a-life-fully-at-sea-180983926/

2. **Around 20–25 million years ago, pinnipeds split into true seals, eared seals, and walruses.** Morphological and molecular studies of Enaliarctos and other early fossils underline the divergence into Phocidae, Otariidae, and Odobenidae. Otariids, the eared seals, gained external ear flaps and strong rotating flippers that allow them to walk on land. This distinction explains why sea lions and fur seals behave differently than true seals and walruses.
https://www.nhm.ac.uk/discover/news/2024/may/most-comprehensive-seal-family-tree-reveals-hidden-history-of-walruses.html

3. **Modern sea lions appear in the late Pleistocene, roughly 70,000–20,000 years ago.** Late Pleistocene fossils and genetic divergence estimates show sea lions stabilizing into their modern form during this period. They developed the traits we recognize today, long foreflippers, visible ear flaps, and flexible posture on land. These adaptations let them live most of their lives in the ocean while still forming large, noisy colonies onshore.
https://www.frontiersin.org/articles/10.3389/fevo.2019.00457/full

4. **There are six living sea lion species, mostly in the Pacific, with mixed conservation outlooks.** Species include California, Steller, South American, Australian, New Zealand, and Galápagos sea lions. California sea lions are abundant and thriving along the U.S. West Coast, Baja, and into the Galápagos. Steller sea lions stretch from California up into Alaska and across to Russia and Japan, with eastern populations stabilizing but western ones still in danger. South American sea lions remain fairly numerous, while the Australian, New Zealand, and Galápagos species are small, isolated, and much more vulnerable to decline.
https://www.britannica.com/animal/sea-lion

5. **Sea lions are opportunistic hunters, and pup mortality is roughly 40 percent in the first year.** They feed on anchovies, sardines, squid, octopus, and sometimes seabirds, diving as deep as 600 feet and staying down up to 10 minutes. Females give birth after about 11 months, a cycle that includes delayed implantation, and almost always produce a single pup. About 40 percent of these pups die in their first year, mostly due to starvation when food is scarce, predation by sharks or orcas, disease outbreaks, or trampling accidents in crowded breeding rookeries.
https://www.fisheries.noaa.gov/species/california-sea-lion

6. **Predators include orcas and great white sharks, and pups face risks from gulls, dogs, and large males at crowded rookeries.** Orcas and great white sharks are the primary natural predators of sea lions, forcing vigilance both at sea and near haul-out sites. Pups are especially vulnerable, gulls may attack them, stray or domestic dogs harass or kill them on human-used beaches, and large territorial males sometimes injure or kill pups during fights. On top of predation, sea lions compete for fish with tuna, seabirds, and even other pinnipeds, adding constant ecological pressure.
https://oceana.org/marine-life/california-sea-lion/

7. **Peak vs low: populations swung widely, and the lows are quantifiable.** Steller sea lions fell from about 300,000 in the 1970s to roughly 100,000 by the 1990s, losing more than 80 percent in some western Aleutian rookeries. South American sea lions remain relatively numerous at ~250,000–300,000 individuals. Australian (~12,000), New Zealand (~10,000–12,000), and Galápagos (~16,000–24,000) sea lions are far smaller and more vulnerable.
https://www.fisheries.noaa.gov/species/steller-sea-lion

8. **Human encroachment includes net entanglement, overfishing, coastal development, and attacks by domestic dogs on pup haul-outs.** In the 19th and early 20th centuries sea lions were exploited for their hides and oil, and later trained for circuses, Hollywood films, and even Cold War naval programs. Today entanglement in fishing gear is one of the most common causes of injury or death, while overfishing reduces the schools of sardines and anchovies they depend on. Coastal development crowds their haul-out beaches, leaving less safe space for rookeries. On top of this, unleashed dogs present a modern hazard, especially for vulnerable pups on shared beaches.
https://www.swimwithdolphinsbahamas.com/how-people-have-affected-sea-lions/

9. **Conservation measures and results: big wins, unfinished work.** The Marine Mammal Protection Act (1972) stopped large-scale hunting, allowing California sea lions to rebound to over 200,000. Eastern Steller populations have stabilized or grown, while western populations remain endangered at 40,000–50,000. South American colonies are mostly stable, but Australian (~12,000), New Zealand (~10,000–12,000), and Galápagos (~16,000–24,000) populations are still threatened by disease, bycatch, and climate cycles like El Niño. Conservation now includes rookery protection, rescue and rehab, satellite tagging, and ecotourism that promotes preservation over exploitation.
https://www.treehugger.com/are-sea-lions-endangered-5270525

Worksheet

Name: _____ Date: _____

Review

1. What does the word pinniped mean?

2. When did pinnipeds first branch from land carnivores?

3. Name the three pinniped families.

Discussion

4. How can you tell a sea lion from a seal?

5. Why did sea lions never establish themselves in Antarctica?

Data Analysis

6. Steller sea lions declined from 300,000 in the 1970s to about 100,000 in the 1990s. What percentage decline is that?

7. If pup mortality is 40% in the first year, how many pups out of 1,000 are expected to survive their first year?

Reflection

8. What is one major human impact on sea lions today?

9. In your opinion, what is the most important conservation effort for sea lions, and why?