Lesson Plan: Pteranodon

Summary

In this episode, Blade introduced a Pteranodon drawn from the Random Object Randomogrifier. He explained that it lived during the Late Cretaceous, around eighty-four to eighty-six million years ago, soaring above the inland sea that once split North America. Blade described it as a pterosaur, not a dinosaur, with a long beak, pinky-powered wings, and no teeth. He joked about wingspans measured in giraffes and bananas, compared its flight to a flying squirrel, and talked about how the males were larger, the females smaller, and both long extinct before the asteroid ended the age of dinosaurs.
https://www.youtube.com/live/f1Z2k5UZLsU?si=wbJyPrGGG_8qu1pl

Objective

Students will identify the key traits of Pteranodon, distinguish pterosaurs from dinosaurs, and explain how fossil evidence helps scientists understand flight and extinction in prehistoric species.

Standards

- NGSS MS-LS4-1: Analyze and interpret data for patterns in the fossil record.
- CCSS.ELA-LITERACY.RST.6-8.2: Determine the central ideas of a scientific text and summarize key information.
- C3 Framework D2.His.2.6-8: Classify historical developments as examples of change and continuity.

Materials

- 9 Fun Facts about Pteranodon (attached below)
- Worksheet (included below)
- Optional: paper, pencils, printed fossil images or reconstructions

Activity

1. Review the 9 Fun Facts about Pteranodon together.
2. Examine how its wings differed from birds, focusing on the pinky bone structure.
3. Compare the wingspans of males and females to understand sexual dimorphism.
4. Identify why Pteranodon left no descendants while birds survived.
5. Have students complete the worksheet for comprehension and reflection.

Introduction

Ask students to share what they know about flying reptiles. Clarify that Pteranodon was not a dinosaur but a pterosaur, a separate branch of flying reptiles. Discuss its meaning as "toothless flyer" and its habitat above the ancient inland sea. Use humor from the transcript, such as wingspans in "giraffes and bananas," to engage curiosity.

Assessment

Evaluate student participation, worksheet accuracy, and their ability to explain why Pteranodon was a pterosaur rather than a dinosaur.

Rubric

Criteria	Excellent (4)	Good (3)	Fair (2)	Poor (1)
Content Understanding	Clearly explains Pteranodon traits and history	Mostly accurate explanation	Basic understanding	Limited or incorrect understanding
Discussion Participation	Actively contributes ideas and humor	Participates with prompting	Occasionally participates	Rarely participates
Worksheet Completion	Answers correct and thoughtful	Minor errors	Some correct answers	Many errors
Technology Connections	Uses provided materials effectively	Uses some materials	Minimal material use	Does not use materials

9 Fun Facts

1. Age Pteranodon lived during the **Late Cretaceous Period**, about **86 to 84 million years ago**, soaring over warm shallow seas while dinosaurs ruled the land.
https://kids.britannica.com/kids/article/Pteranodon/602931

2. Where Fossils have been found across **North America**, especially Kansas, Nebraska, South Dakota, Wyoming, and Alabama, where a vast inland ocean called the **Western Interior Seaway** once stretched from the Gulf of Mexico to the Arctic.
https://www.amnh.org/explore/news-blogs/pteranodon-longiceps

3. Toothless Flyer Its name literally means "**toothless wing**" from the Greek *pteron* (wing) and *anodon* (without teeth). Pteranodon had a long, pointed beak perfect for catching fish but no teeth at all.
https://www.britannica.com/animal/Pteranodon

4. Relation to Helic-o-pter The word "helicopter" shares the same Greek root *pteron*, meaning "wing." So "helicopter" means "spiral wing." Pteranodon and helicopters both earn their names from the **Greek for flight**, not from any real connection.
https://uselessetymology.com/2020/03/29/etymological-journeys-what-do-pterodactyls-helicopters-and-confederates-have-in-common

5. Discovery The first *Pteranodon* fossils were uncovered in the **1870s** in the Smoky Hill Chalk of Kansas. **Othniel Charles Marsh** initially thought they belonged to *Pterodactylus*, but after studying skulls collected by **Samuel Wendell Williston**, he realized they represented a new, toothless flying reptile. Marsh officially named *Pteranodon* in **1876**, making it one of the earliest pterosaurs identified in North America.
https://www.extinctanimals.org/pteranodon.htm

6. Number of Fossils With more than **1,100 known specimens**, Pteranodon is the **best-represented pterosaur** in the fossil record. Most remains are partial, since their hollow bones crushed easily during fossilization.
https://www.smithsonianmag.com/smart-news/what-shark-tooth-doing-neck-flying-pterosaur-180971104

7. Largest Specimen The biggest male *Pteranodon* specimens had wingspans reaching **up to 7 meters (23 feet)**—about the width of a small plane. Males also had larger crests, likely used for display or balance in flight. Females were smaller and crestless.
https://www.extinctanimals.org/pteranodon.htm

8. Wing Structure Pteranodon's wings were **skin membranes stretched along an enormous fourth finger**, built more like a **flying squirrel's gliding flap** than a bird's feathered wing. But unlike squirrels, it could **truly fly**, not just glide.
https://www.nhm.ac.uk/discover/the-truth-about-pterosaurs.html

9. Extinction and Legacy *Pteranodon* and all other pterosaurs disappeared about **66 million years ago** during the mass extinction that ended the Cretaceous. They left **no living descendants**, since birds evolved from dinosaurs, not pterosaurs. The largest and last of their kind, like *Quetzalcoatlus*, vanished just before the impact.
https://animals.howstuffworks.com/extinct-animals/pterosaurs.htm

Worksheet

Name: _____ Date: _____

Review

1. During what geologic period did Pteranodon live, and what happened to it before the asteroid impact?

2. Why is Pteranodon classified as a pterosaur rather than a dinosaur?

3. What does the name “Pteranodon” mean, and how does it describe the animal?

Discussion

4. How does the Greek root “pteron” connect the words Pteranodon and helicopter?

5. Who discovered and named Pteranodon, and what feature made it different from earlier pterosaurs?

Data Analysis

6. Based on fossil locations along the Western Interior Seaway, what can we infer about Pteranodon’s environment?

7. Compare the wingspans of males and females. What might the size difference suggest about their behavior or role?

Reflection

8. What surprised you most about Pteranodon’s anatomy or habits?