Lesson Plan: Velociraptor Skull

Summary

In this session, students explore the Velociraptor skull through discussion of its discovery, anatomy, and behavior. The transcript highlights the 1923 Gobi Desert find, its long snout, curved teeth, and brain-to-body ratio. Evidence from fossils shows nocturnal activity, solitary habits, feathers, and warm-blooded traits. One remarkable fossil even preserved a pterosaur bone in its gut.
https://www.youtube.com/live/vsyKwrNP_-A?si=p7vBj-kkqgLJVgCr

Objective

Students will analyze the Velociraptor skull to understand how fossil evidence informs scientists about dinosaur anatomy, behavior, and ecology.

Standards

- NGSS MS-LS4-1: Analyze and interpret data for patterns in the fossil record that document the existence and diversity of life forms.
- CCSS.ELA-LITERACY.RST.6-8.1: Cite specific textual evidence to support analysis of science texts.
- C3.D2.His.1.6-8: Analyze connections among events and developments in historical contexts.

Materials

- 9 Fun Facts (provided below)
- Worksheet (provided below)
- Optional: images of Velociraptor fossils, paper, pencils, white board

Activity

1. Read through the 9 Fun Facts with students.
2. Discuss each fact, highlighting how it was discovered and why it matters.
3. Have students complete the worksheet, using the facts to answer questions.
4. Encourage students to compare fossil evidence with popular media portrayals of Velociraptor.

Introduction

Introduce students to Velociraptor by examining its skull. Explain how fossil evidence, including teeth, braincase, eye rings, and preserved remains, gives scientists clues about its lifestyle and behavior.

Assessment

- Completion of the worksheet.
- Participation in discussion of how fossils inform scientific understanding.
- Ability to cite evidence from the 9 Fun Facts in answers.

Rubric

Criteria	Excellent (4)	Good (3)	Fair (2)	Poor (1)
Content Understanding	Accurately explains all 9 Fun Facts	Explains most Fun Facts correctly	Explains few Fun Facts	Little or no understanding
Discussion Participation	Actively engaged in discussion	Participates occasionally	Minimal participation	No participation
Worksheet Completion	All questions answered thoroughly	Most questions answered	Few questions answered	Worksheet incomplete
Technology Connections	Effectively connects lesson with digital tools	Some connections made	Minimal connections	No connections

9 Fun Facts

1. The first Velociraptor fossil was a crushed skull with a claw In 1923, Peter Kaisen discovered a crushed skull and a large claw in Mongolia's Gobi Desert while on a Roy Chapman Andrews expedition.
https://www.amnh.org/research/paleontology/collections/fossil-halls/fighting-dinosaurs

2. The Velociraptor's skull was long and narrow Its skull measured about 23 cm, with the snout making up nearly 60 percent of that length, adapted for quick snapping bites.
https://www.nhm.ac.uk/discover/dino-directory/velociraptor.html

3. Its teeth curved backward like fishhooks Velociraptor had serrated teeth that curved backward to grip prey tightly and prevent escape once bitten.
https://www.nhm.ac.uk/discover/dino-directory/velociraptor.html

4. Fossils show Velociraptor was clever for its size The braincase inside its skull reveals a high brain-to-body ratio, suggesting intelligence comparable to modern birds such as crows.
https://naturalhistory.si.edu/explore/faq/how-smart-were-dinosaurs

5. Sclerotic rings suggest Velociraptors may have hunted at night These rings of bone inside the eye sockets indicate activity in low light, similar to owls and other nocturnal predators.
https://www.scientificamerican.com/article/dinosaur-eyes-shed-light-on-their-daily-activity/

6. Bone evidence supports warm-blooded Velociraptors Fossilized proteins and bone growth rates show similarities to kiwi birds, pointing to warm-blooded metabolism and high energy needs.
https://www.science.org/content/article/warm-blooded-velociraptors-fossilized-proteins-unravel-dinosaur-mysteries

7. A long skull needed balance from a stiff, flexible tail The weight of the skull was countered by a tail reinforced with ossified tendons, keeping Velociraptor stable while running or striking.
https://www.scirp.org/journal/paperinformation?paperid=114382

8. No solid evidence shows Velociraptors hunted in packs Fossil finds are typically of individuals and isotope-style studies on related raptors indicate solitary hunting rather than coordinated pack behavior.
https://www.uwosh.edu/today/84696/jurassic-park-got-it-wrong-uwo-research-indicates-raptors-dont-hunt-in-packs/

9. A Velociraptor once died with a pterosaur bone in its gut One specimen was preserved with a large pterosaur bone in its ribcage, showing that Velociraptor scavenged as well as hunted.
https://www.sciencedirect.com/science/article/abs/pii/S0195667112000221

Worksheet

Name: _____ Date: _____

Review

1. Who discovered the first Velociraptor fossil and in what year?

2. How long was the Velociraptor skull, and what portion was the snout?

3. Velociraptor teeth curved backward like _____.

4. What does the brain-to-body ratio suggest about Velociraptor?

5. What do sclerotic rings in the eyes suggest about its daily activity?

Discussion

6. What evidence suggests Velociraptors were warm-blooded?

7. What does the fossil with a pterosaur bone in its gut reveal about Velociraptor's eating habits?

Data Analysis

8. How did the Velociraptor's stiff, tendon-reinforced tail support its long skull and hunting style?

Reflection

9. How does comparing fossil evidence with movie portrayals change your view of Velociraptors?