Lesson Plan: Terrapin

Summary

In this lesson, Blade sketched a toy terrapin and discussed turtles in the reptile family tree. He explained that turtles split from other reptiles about 200 million years ago and are closer to crocodiles and birds than to snakes and lizards. The session covered scutes, the fused rib cage that forms a turtle shell, the invasive spread of red eared sliders through the pet trade, and cultural influences like the Teenage Mutant Ninja Turtles. The Algonquian origin of the word terrapin was noted, along with conservation challenges and slow recoveries for some populations through nesting protection, invasive predator control, and breeding programs.

Full episode link: https://www.youtube.com/live/1zsk4jfSNzs?si=B2nrg5HpxIjTq63n

Objective

Students will learn the evolutionary history of turtles, identify shell anatomy and scutes, analyze the invasive spread of red eared sliders, connect cultural influences to real world impacts, and evaluate conservation challenges and successes for turtles and tortoises.

Materials

- 9 Fun Facts (provided below)
- Worksheet (provided below)
- Optional: images of turtle shells, crocodile scutes, red eared sliders, Galápagos tortoises

Introduction

Ask students whether turtles are closer to lizards or birds, and why. Collect brief answers, then introduce the idea that turtles share a broader lineage with crocodiles and birds. Show the difference between overlapping reptile scales and scutes to set up the anatomy segment.

Activity

1. Present the 9 Fun Facts and have students connect history, anatomy, ecology, and culture.
2. Explain scutes and the fused rib cage that forms a turtle shell.
3. Discuss red eared sliders in the pet trade and how releases lead to invasive populations.
4. Survey turtle appearances in popular media and connect interest to pet demand.
5. Review conservation examples, including nesting protection, invasive predator removal, and breeding with reintroduction.

Assessment

- Explain how turtles are related to birds and crocodiles.
- Describe scutes and how they differ from overlapping scales.
- Describe why red eared sliders became invasive globally.
- Explain how TMNT influenced pet turtle demand.
- Summarize one conservation challenge and one success.

Rubric

Criteria	Excellent	Satisfactory	Needs Improvement
Evolutionary Understanding	Accurately explains turtle ancestry and relation to crocodiles and birds	Partial explanation with some details missing	Incorrect or vague explanation
Anatomy of Scutes	Correctly describes scutes and how they differ from overlapping scales	Partial description, limited clarity	Incorrect or no description
Invasive Species Impact	Fully explains red eared slider spread and ecological effects	Some explanation but missing depth	Incorrect or no explanation
Cultural Connection	Clearly links TMNT to increased pet turtle demand	Mentions TMNT but no link to pet trade	No cultural link made
Conservation Awareness	Identifies both challenges and successes with detail	Identifies either challenge or success	No clear understanding of conservation

9 FUN FACTS

1. Turtles are an ancient reptile branch more closely related to birds and crocodilians than to lizards or snakes. Multiple large DNA datasets place turtles as sister to the archosaur line, which includes birds and crocodilians. This clarifies a long debate that anatomy alone could not settle. The finding is robust across independent phylogenomic analyses.
https://bmcbiol.biomedcentral.com/articles/10.1186/1741-7007-10-65

2. Turtles and crocodilians both wear scutes rather than overlapping scales. Scutes are tough, plate like coverings that in turtles form the shell's outer layer and in crocodilians armor the body. The form differs between groups, but the basic plan is shared and distinct from the thin overlapping scales of most snakes and lizards.
https://www.britannica.com/science/scute

3. Red eared sliders became mass market pets by the 1950s and 1960s. They were sold as inexpensive dime store turtles and later farmed in huge numbers, which primed the modern pet trade. Their popularity set the stage for public health rules and later invasive spread when unwanted pets were released.
https://reptilesmagazine.com/a-history-of-the-pet-hatchling-aquatic-turtle-trade-in-the-united-states/

4. Red eared sliders turned invasive on several continents. They are documented across Europe, Asia, and Australia after export and release, with more than 50 million exported from the United States in one eight year span. Their adaptability and longevity give them an edge over native turtles.
https://www.iucngisd.org/gisd/species.php?sc=71

5. Standard control measures include trapping, removal, trade restrictions, and public reporting. Government programs pair surveillance and trapping with bans on keeping and selling sliders to prevent new releases. Public tip lines and joint agency campaigns are used to locate and remove feral populations.
https://www.dpi.nsw.gov.au/about-us/media-centre/releases/2019/successful-partnership-helps-deal-with-invasive-red-eared-slider-turtle

6. Turtles are pop culture regulars, with the Teenage Mutant Ninja Turtles leading the pack. TMNT began as a comic in the 1980s and exploded into a long running franchise in television, film, toys, and games. The property cemented turtles as household icons for multiple generations.
https://www.britannica.com/topic/Teenage-Mutant-Ninja-Turtles

7. The TMNT craze helped drive real world demand for pet turtles. News and culture coverage during and after the 1990s documented surges in turtle purchases tied to new TMNT releases. That demand contributed to later abandonment and releases when pets outgrew tiny bowls.
https://www.inverse.com/entertainment/teenage-mutant-ninja-turtles-red-eared-sliders-ecology

8. Turtles and tortoises face human driven declines, and the Pinta Island tortoise went extinct in 2012. Key pressures include habitat loss, bycatch, pollution, and collection for trade, with sea turtles and Galápagos tortoises among those affected. Lonesome George's death in 2012 marked the end of the Pinta Island tortoise lineage and became a global conservation warning.
https://www.amnh.org/explore/preserving-lonesome-george

9. Targeted conservation is working in places, but recovery is slow. Successful tools include hands on nest protection, removal of invasive predators on islands, and long running captive breeding with reintroduction. Galápagos tortoise programs that incubate eggs, raise juveniles, and control invasive animals illustrate how coordinated action lifts numbers over decades.
https://www.wired.com/2014/04/inside-the-galapagos-islands-giant-tortoise-rehab-effort

Worksheet

Name_____ Date_____

Review

1. When did turtles split from other reptiles?

2. What are scutes and how do they differ from overlapping scales?

Discussion

3. Why did red eared sliders become common in the pet trade?

4. How did the TMNT franchise affect real world turtle populations?

Data Analysis

5. Compare the spread of red eared sliders in Europe and Asia. What ecological risks do they pose?

6. How does the Pinta Island tortoise extinction highlight broader conservation challenges?

Reflection

7. What responsibilities do humans have in preventing invasive species releases?

8. Why is slow progress in conservation still valuable?