National Park Service
U.S. Department of the Interior

Badlands National Park

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What Color Was I?: Pre-Visit Lesson

Badlands Fossils, Grades 1-5

Objectives:

Students will be able to recognize three fossilized animals of Badlands National Park and identify them as mammals. Students will be able to identify at least one fossilized sea creatures from Badlands National Park. Students will be able to orally describe the major steps in the process of fossilization.

Standards:

SD Life Science Standards: 1.L.3.1; 2.L.3.3; 3.L.3.4; 4.L.2.1; 5.E.1.1

Materials:

- Badlands Virtual Experience on Views of the National Parks computer-based learning program at http://nature.nps.gov/views/layouts/Main.html#/BADL/past/
- Badlands Fossil Trading Cards
- Copies of Coloring Sheet and Crayons

Background:

The environmental conditions that deposited the Badlands sedimentary layers, or strata, significantly increased an animal's chance of fossilization. When an animal died, say a saber tooth cat living on an ancient flood plain, its body would decompose- just like animals do today. But, if conditions were just right, an animal's hard parts (mostly teeth, jaws, skulls, and shells) might become fossils. When the Badlands formed, sediments like sand, mud, and silt would quickly cover some of the dead animals. This fast burial protected the bones, teeth, and shells from decomposition. Over time, these protected hard parts changed into the fossils we find today.

Badlands National Park is well known for its excellent fossil record. The fossils are from different time periods. The oldest Badlands fossil are marine fossils from the late Cretaceous (69 to 74 million years ago). Although dinosaurs were alive during the Cretaceous, no dinosaur fossils have ever been found in Badlands National Park. Dinosaurs were land animals; therefore, they would not be found with sea creatures.

The next time period of fossils in Badlands National Park is known as the "Golden Age of Mammals" from 25 to 37 million years ago. Dinosaurs were extinct and mammals such as ancient dogs, horses, rhinos, camels, saber-toothed cats, oreodonts, and titanotheres ruled the land. This lesson introduces students to the fossilized animals of Badlands National Park.

Procedure:

1. Tell the class that a Park Ranger from Badlands National Park will be visiting the classroom by video conference. Describe where Badlands National Park is located. Show a map or tell the students

how long it would take to travel to the Badlands.

2. Explain that Badlands National Park is a special place that is protected by the National Park Service. Badlands National Park is world famous for the incredible fossils preserved in the rock layers. Project the Badlands Virtual Experience and show students pictures of the park, fossils, and paleontologists at work. Discuss how fossils are formed.

3. Hand out the coloring sheet. These ancient animals are **extinct**. They are found as fossils at Badlands National Park. Explain that none of these animals are dinosaurs. Ask the students to find the ammonite and bacculite. Look for animals with shells that would have lived in the ocean. These animals were alive at the time of the dinosaurs. When dinosaurs were alive, there was a sea across the middle of North America. Because the area now known as Badlands National Park was an ocean environment during the time of the dinosaurs, paleontologists do not find any dinosaur fossils here. They find sea creatures such as ammonites and bacculites. They also find shark teeth and other fossil evidence of the sea such as mosasaurs, a marine reptile that resembled a 32 foot long crocodile.

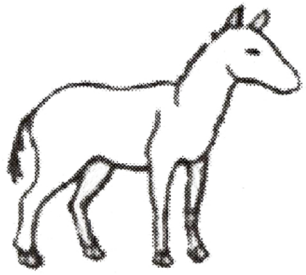
4. All of the other animals on the coloring sheet are **mammals**. Badlands National Park has an excellent fossil record from the "Golden Age of Mammals." This time in Earth's history occurred from 25 to 37 million years ago. By this time in the geologic past, the ancient sea had drained away and given way to a terrestrial environment. Dinosaurs had gone extinct and mammals such as these ruled the land. See the Badlands Fossil Trading Cards for more information on these fossilized animals. Also see the "Creature Feature" on the Badlands Virtual Experience at http://nature.nps.gov/views/layouts/Main.html#/BADL/past/creature/.

Other Resources:

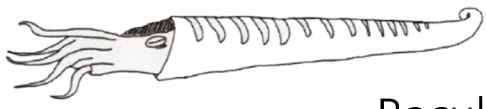
These resources are available through Badlands National History Association (BNHA), a not-for-profit organization established to support education and research efforts at Badlands National Park. **badlandsnha.org**

- *Badlands Suite: Land of Stone and Light, From Field to Lab, Multiple Perspectives* (DVD)
- *Fossils Tell of Long Ago* by Aliki (children's book)
- *Prehistoric Journey: A History of Life on Earth* by Kirk R. Johnson and Richard K. Stucky (children's reference book with many pictures)

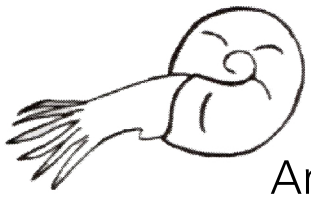
Teachers participating in a ranger-led Badlands National Park Education Outreach Program receive a 15% discount on purchases from BNHA. Discount is valid from the time a program is scheduled to one month after the program. Please provide name, school, and discount code BIYC Education when you place your order at badlandsnha.org.



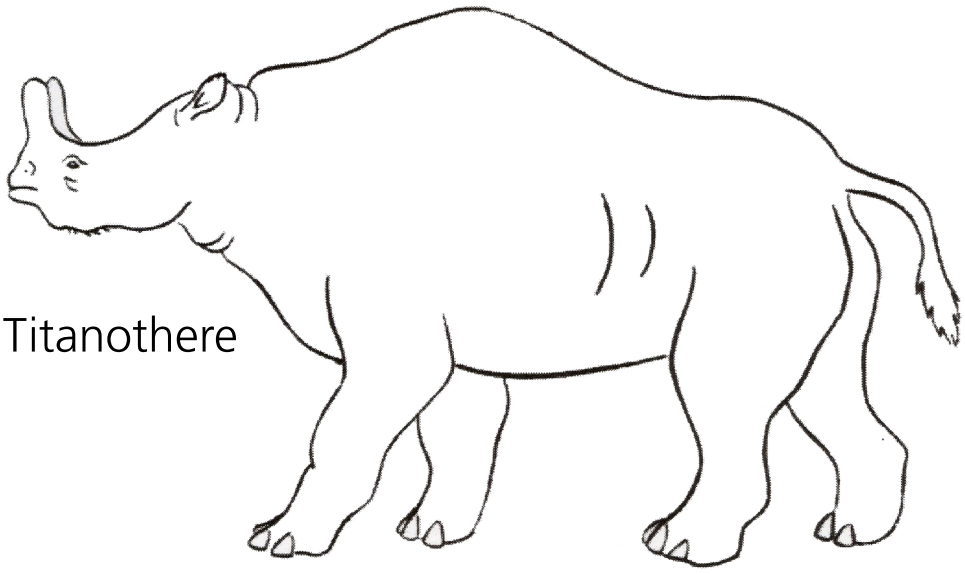
Mesohippus



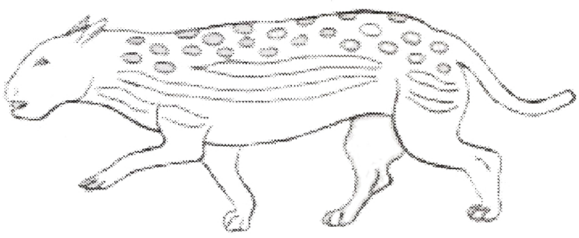
Baculite



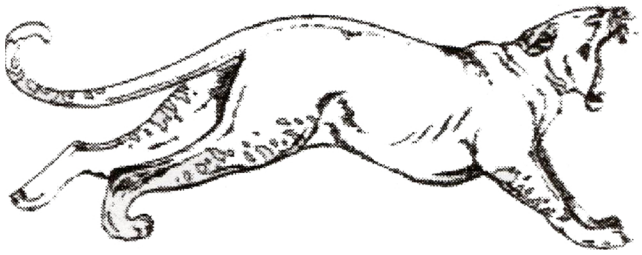
Ammonite



Titanothere



Oreodont



Saber-toothed Cat