



**DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK**

NAVIGATION

Move forward using the → key or click **NEXT**.

Move back using the ← key or click **BACK**.

Do not close your internet browser or you will lose your work.

TOOLS

- Click help if you are confused.
- Hover pointer over images to get more information.
- Click and drag items to the timeline or to your Field Book.
- Use the comment box to make notes, justify answers, and ask questions.

NEXT →



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TO YOUR FIELD BOOK

What Happened Here?

Paleontologists have collected fossils from two sites. The samples are similar, but there are key differences between them.

What could have caused these differences?

BEGIN

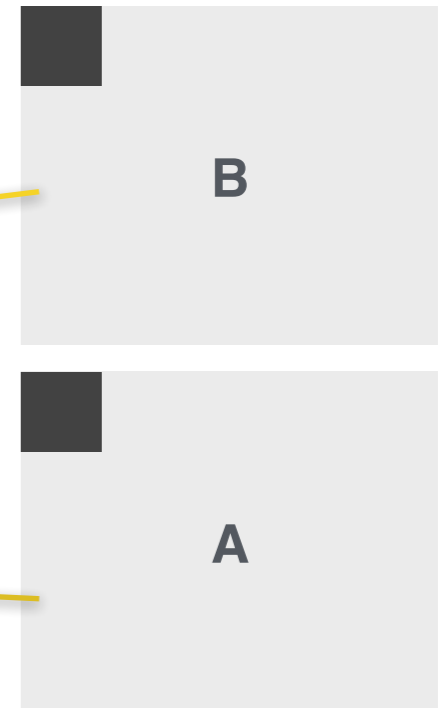


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TO YOUR FIELD BOOK

Choose a sample.

Two fossil collections have been brought in from the field. Before you can determine what happened at these two locations, you have to find out what animals these fossils represent.

Choose a sample and start your investigation!



← BACK

NEXT →



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TO YOUR FIELD BOOK

What kinds of fossils are these?

When hunting for fossils, it's rare to find whole animals or plants, but even pieces can have great scientific value!

Click and drag each fossil to the category where you think it belongs.

TEETH

LIMBS

VERTEBRAE

SHELLS

DERMAL/
SCALES

OTHER



← BACK

NEXT →



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OTHER

Teeth

Hard structures in the mouth used for chewing or processing of food. They can have many different shapes, based on diet.



← BACK

NEXT →



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TO YOUR FIELD BOOK

Identifying fossils

Some fossils can be difficult to identify. Watch the video to learn how scientists identify fossils.



Characteristics of fossils

← BACK

NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

What are these fossils?

Use the field guide to determine what animals these fossils are from.



SHELLS



SHELLS



VERTEBRAE



TEETH



OTHER



OTHER



VERTEBRAE

NAME OF ANIMAL

TEETH

LIMBS

VERTEBRAE

SHELLS

DERMAL/
SCALES

OTHER

← BACK


NEXT →





DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK


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SHELLS



SHELLS


VERTEBRAE


















































TEETH


OTHER


OTHER


VERTEBRAE

NAME OF ANIMAL

	TEETH	LIMBS	VERTEBRAE	SHELLS	DERMAL/ SCALES	OTHER
Vertebrae	1 mm	Front	Rear	Left side	Top	Animal
						
						
						
						
						
						
						
						

← BACK















NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

Scientist check-in








How did you do? Do you want to try again? ☐ YES ☐ NO

YOU		SCIENTIST	
 SHELLS	NAME OF ANIMAL	 SHELLS	NAME OF ANIMAL
 SHELLS	NAME OF ANIMAL	 SHELLS	NAME OF ANIMAL
 VERTEBRAE	NAME OF ANIMAL	 VERTEBRAE	NAME OF ANIMAL
 TEETH	NAME OF ANIMAL	 TEETH	NAME OF ANIMAL
 OTHER	NAME OF ANIMAL	 OTHER	NAME OF ANIMAL
 OTHER	NAME OF ANIMAL	 OTHER	NAME OF ANIMAL
 VERTEBRAE	NAME OF ANIMAL	 VERTEBRAE	NAME OF ANIMAL

← BACK

NEXT →



	NAME OF ANIMAL
	NAME OF ANIMAL
	NAME OF ANIMAL
	NAME OF ANIMAL
	NAME OF ANIMAL
	NAME OF ANIMAL
	NAME OF ANIMAL

Learning about the past through fossils.

Studying fossils is the only way scientists can learn about ancient ecosystems. They give us a window into the past, and let us discover how the world has changed over time.

What organisms (animals and plants) were present? Knowing what lived in this place, can you predict what the environment was like? Write down your description.

Write description here...

← BACK

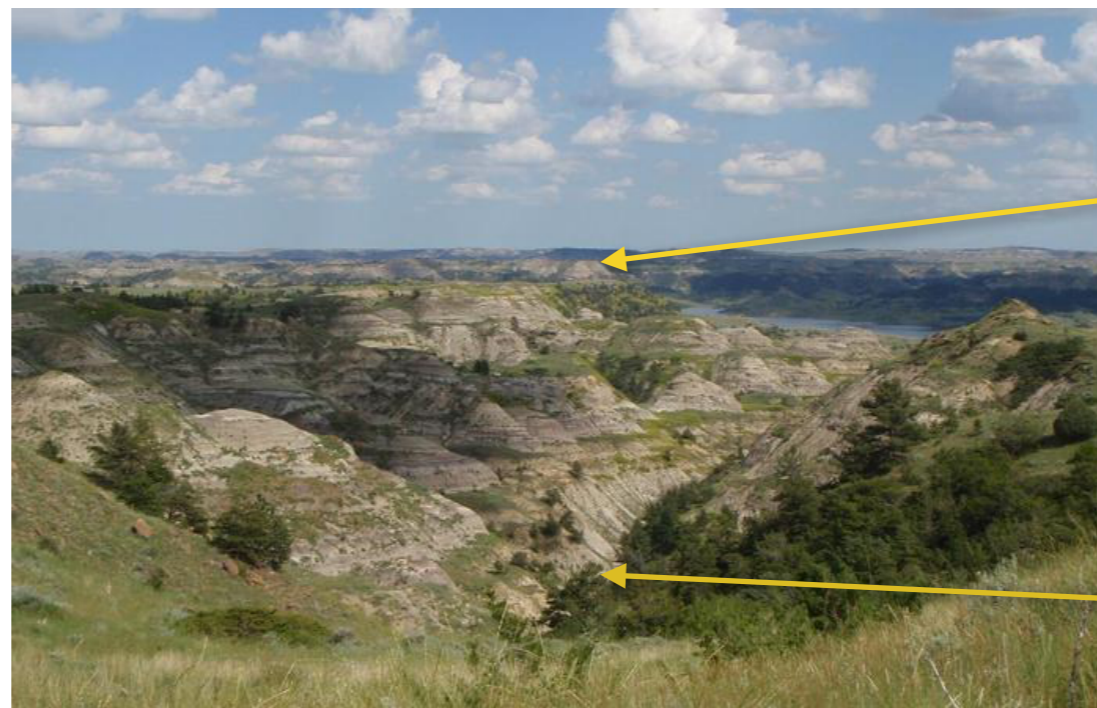
NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

Back to the hillside

It's time to go back to the hillside and get the other set of fossils. Use what you have learned to go through the process again with this new sample.



B

A

← BACK

NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

What are these fossils?

Now that you've learned what features are used to identify fossils, try it again with this second batch. Some fossils sites might yield hundreds of fragmentary fossils like this. Paleontologists get a lot of practice!

Click and drag each fossil into the category you think it belongs in.

TEETH

LIMBS

VERTEBRAE

SHELLS

DERMAL/
SCALES

OTHER



← BACK

NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

Write explanation here...

Your observations.

Compare and contrast the lists of fossils from the two sites. What sort of evidence for change do you see?

SITE A

Crocodile: *Osteoderm* Crocodiles are semi-aquatic ambush predators.

Turtle: *Shell* Some turtles live on land, some live in the water, and many live in between.

Metasequoia: *Seed* Also known as the Dawn Redwood, this tree has relatives still alive today.

Theropod: *Tooth* Theropods are a diverse group of bipedal dinosaurs. Most were carnivorous, though some adapted to eat plants.

Gar: *Vertebra* Gars are an ancient group of primarily freshwater fish. They prefer shallow water, where they hunt their prey.

Coprolite: Coprolites give hints as to the animal's diet, but it can be hard to tell what animal a coprolite is from.

Champsosaur: *Vertebra* Champsosaurs are an extinct order of semi-aquatic reptiles. They had a carnivorous diet and looked and behaved much like modern crocodiles.

SITE B

Crocodile: *Osteoderm* Crocodiles are semi-aquatic ambush predators.

Turtle: *Shell* Some turtles live on land, some live in the water, and many live in between.

Land snail: *Shell* These snails lived on land and breathed air. Land snails are usually herbivorous.

Crocodile: *Tooth* Crocodiles are semi-aquatic ambush predators.

Gar: *Vertebra* Gars are an ancient group of primarily freshwater fish. They prefer shallow water, where they hunt their prey.

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← BACK

NEXT →



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TO YOUR FIELD BOOK

Write explanation here...

Your explanations.

The more data you have, the more complete your understanding of the environment will be. You have been given an additional list of fossils your colleagues have identified at the two sites. Using these combined data, how do you explain the differences between the two sites? [Click for a reminder of the stratigraphy of these two sites](#). Is there anything else you could do to support your hypothesis?

SITE A

Pterosaur: Pterosaurs are extinct flying reptiles. Some were covered in hair-like pycnofibres.

Torosaurus iatus: Torosaurus, like its relative Triceratops, was a frilled and horned herbivorous dinosaur.

Cimolodon nitidus: A small primitive mammal that has no surviving relatives.

Didelphodon: An early marsupial mammal. While only as big as an opossum, this was one of the largest mammals of its time.

Frog: Frogs rely on water to reproduce and are primarily insectivorous.

Ray: Also known as stingrays, these are cartilaginous fish, related to sharks.

Ammonite: Extinct marine cephalopods. Ammonites often had spiraled shells that look similar to modern nautilus shells, but that form differently.

Palm tree: A tree with close relatives alive today, palm trees are found in tropical to semi-tropical environments.

Magnolia: A flowering tree species.

Cobbania: An ancient species of water lettuce.

SITE B

Gunnera: A flowering plant, gunneria grows best in moist semi-tropical to tropical conditions.

Purgatorious: An early relative of primates, this was a small tree-dwelling mammal.

Frog: Frogs rely on water to reproduce and are primarily insectivorous.

Novacaesareala: An early species of aquatic bird.

Ginkgo: Ginkgos are often considered "living fossils," as modern ginkgo are very similar to fossil specimens.

Boa: Boas are nonvenomous snakes that subdue prey by constriction.

Cimolestes: An early placental mammal.

Shark: Sharks are carnivorous fish with cartilaginous skeletons.

Oyster: This species is still around today and is an important food source in many cultures.

Palm tree: A tree with close relatives alive today, palm trees are found in tropical to semi-tropical environments.

← BACK

NEXT →



DRAG & DROP HERE TO ADD
TO YOUR FIELD BOOK

The mystery solved.

In this exercise, you used a small set of fossils to explain what happened at a location over time. However, what happened here was not just a local event. Scientists researched fossils from all over the world and realized that something much bigger had happened. They saw similar patterns of change across the globe. These changes pointed to a worldwide catastrophe.

To arrive at a big conclusion, you need a lot of evidence. Watch the video below to see what data the scientists used, and what explanation they arrived at.



The changing ecology of the Hell Creek Formation.

← BACK

FINISH