



touch history

Types of Fossils

(Follow up to *What is a Fossil?* Activity)

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Grade Level: Grades K-8

Preparation Time: 10-15 minutes

Activity Duration: 30 minutes-2 hours

Concepts Addressed

- A fossil is evidence of past life.
- Body fossils are fossilized bones, teeth, claws and eggs.
- Microfossils are tiny body fossils often found in accumulations called microfossils.
- Trace fossils are fossilized traces and impressions like footprints, teeth marks, skin impressions, nests, burrows and poop.
- Newly discovered soft tissue fossils are preserved flexible blood vessels and cells inside of bone.

Objectives

The student will:

- Understand that body fossils provide direct evidence of past life.
- Understand that trace fossils provide indirect evidence of past life.
- Classify fossils into body and trace fossil categories.

Materials Included

- Specimens (use only specimens 1, 2, 4-6, 8, 10, 12, 14, 17-19)
 1. Petrified wood
 2. Dinosaur bone (vertebrae)
 3. n/a
 4. Burrow endocast
 5. Dinosaur claw (replica)
 6. Dinosaur tooth (replica)
 7. n/a
 8. Plant impression
 9. n/a
 10. Dinosaur soft tissue (laminated photo)
 11. n/a

12. Dinosaur skull (replica)
 13. n/a
 14. Dinosaur claw (replica)
 15. n/a
 16. n/a
 17. Shell endocast
 18. Dinosaur track fossil (replica)
 19. Dinosaur egg shell
- Magnifying glasses

Background

Once we have established which of the specimens provided are fossils, we can further classify these fossils as either **body fossils**—fossilized body parts such as bones, teeth, claws and eggs, or **trace fossils**—footprints, teeth marks, impressions, nests, burrows and dung. These are important classifications for scientists to make and understand when thinking about what we can observe about a fossil and what can be inferred from that about the animal itself or its behavior. In this activity, students classify the fossil specimens provided as trace or body fossils and provide an explanation for their classification.

Procedure

1. With your class, discuss the differences between trace fossils and body fossils. Talk about what might be classified as a body fossil and what might be classified as a trace fossil and why. Discuss what kinds of information you might be able to learn from each kind of fossil.
2. Set up only the fossil specimens from the specimen collection provided (numbers listed in materials section) with appropriate matching cards around a table or around the room.
3. Have students take out a sheet of paper and pencil and number their sheet from 1-19.
4. Explain that students will be observing a series of fossil specimens. They need to decide if fossil is a body or trace fossil and why they think so.
5. Divide the students up among the 12 fossil specimens. Allow 1-2 minutes per station and tell students when to move on to the next. Or, allow students to take their time and make this into a longer activity. Remind students to carefully match up the numbers of the specimens with the numbers on their paper as some of the numbers were originally assigned to specimens we are not using for this activity.
6. After students have had a chance to observe every specimen, have them return to their seats.
7. As a class, go through the specimens together and discuss observations and conclusions about whether each is a body or trace fossil and why. Use *What is a Fossil?* Notes to aid you in this discussion. As each is discussed, discuss with the group what kinds of information a paleontologist could learn from that particular fossil. For example, from a dinosaur bone a paleontologist might be able to learn about the type of dinosaur from the shape, the size/life stage of a dinosaur from the size, possible injuries the dinosaur had from pathologies (marks indicating injured bone) and age from the internal structure of the bone if histology is done. The first two ideas here (and others) should be

clear to the students—pathologies and histology are more advanced concepts but are included here because some students might mention them.

Extensions

- Have the students create separate trace and body “fossil collections” by drawing the specimens on separate labeled pieces of paper. Include descriptions about what each fossil is and what we can learn from it.

What is a Fossil? Notes

Number	Speciman	Fossil or Not a Fossil	Type of Fossil	Explanation--Fossil or Not a Fossil	Explanation--Type of Fossil
1	Petrified Wood	Fossil	Body Fossil/Trace Fossil	Petrified wood is a fossil. It shows evidence of past life in the texture of the wood grain.	Because petrification means that all of the organism's material is replaced by minerals, this fossil would be classified as a trace fossil--minerals that retain the grain texture of the living organism. However, if any of the original material from the organism is retained, it would be classified as a body fossil.
2	Dinosaur Bone	Fossil	Body Fossil	This dinosaur bone, which is a vertebrae from a relatively small duck-billed dinosaur, is a fossil. It shows evidence of past life by its shape and texture.	This is a body fossil because it is retains actual remains of the animal.
3	Dendrite	Not a Fossil		A dendrite is not a fossil. It does not show evidence of past life. It is a rock with mineral crystals forming a branching pattern on it.	
4	Burrow endocast	Fossil	Trace Fossil	This burrow endocast is a fossil. It shows evidence of past life because it is formed inside an animal produced burrow. An endocast is formed when something created by life (like a burrow) is filled in with sediment. The sediment retains the shape of the burrow.	This is a trace fossil because it implies that the organism was there.
5	Dinosaur Claw (replica)	Fossil	Body Fossil	A dinosaur claw is a fossil. This one is a replica of a real claw that came from a Velociraptor. It shows evidence of past life because it is a body part left behind when an animal died.	This is a body fossil because it is retains actual remains of the animal.
6	Dinosaur Tooth (replica)	Fossil	Body Fossil	A dinosaur tooth is a fossil. This one is a replica of a real fossil tooth that came from an Allosaurus. It shows evidence of past life because it is a body part left behind when an animal died or lost it.	This is a body fossil because it is retains actual remains of the animal.
7	Rock	Not a Fossil		This is not a fossil. It is a mineral called Talc. It does not show evidence of life.	
8	Plant Impression	Fossil	Trace Fossil	This is a fossil. It is an imprint of a plant that was left behind when the plant material rotted away. It shows evidence of life because we can clearly tell that a plant (living organism) left it's mark here.	This is a trace fossil because it implies that the organism was there.

9	Rock	Not a Fossil		This rock is not a fossil. It is a type of rock called basalt. The holes in the rock are formed by air bubbles during a volcanic eruption. It does not show evidence of life.	
10	Dinosaur soft tissue (photo)	Fossil	Body Fossil	This is a photo of dinosaur soft tissue which is a fossil. This soft tissue is from a fossilized T. rex bone. It shows evidence of life because it is actual tissue from the body of an animal that has been preserved. It is an exciting and new fossil find that is not yet completely understood by scientists.	This is a body fossil because it is retains actual remains of the animal.
11	Rock	Not a Fossil		This rock is not a fossil. It is a rock called a concretion. Concretions often form shapes that remind us of living organisms, but they are formed in ways that do not involve life. It does not show evidence of life.	
12	Dinosaur Skull (replica)	Fossil	Body Fossil	This real baby <i>Maiasaura</i> skull from which this replica is made is a fossil. It shows evidence of life because the bones are the remains of a once living dinosaur.	This is a body fossil because it is retains actual remains of the animal.
13	Rock	Not a Fossil		This rock is not a fossil. Although it is egg shaped, it is just a rock. Sometimes processes in nature that do not involve life shape rocks in ways that resemble fossil forms. This rock was likely rounded in a river. It does not show evidence of life.	
14	Dinosaur Claw (replica)	Fossil	Body Fossil	The real <i>Allosaurus</i> front limb claw fossil from which this replica was made is a fossil. It shows evidence of life because it is a preserved body part from a once living animal.	This is a body fossil because it is retains actual remains of the animal.
15	Rock	Not a Fossil		This rock is not a fossil. It is a rock called a concretion. Concretions often form shapes that remind us of living organisms, but they are formed in ways that do not involve life. It does not show evidence of life.	

16	Rock	Not a Fossil		These rocks are not fossils. They are smooth pebbles, likely rounded and polished in a stream. They do not show evidence of life. Some people mistake rocks like these for gastroliths--rocks that some scientists believe dinosaurs ingested to help break down their food. It is very difficult to know if a rounded, polished rock is a gastrolith. The only way to really even come close is to find the rounded, polished rocks inside of a dinosaur skeleton fossil. In that context, you may be able to argue that they show evidence of life and could be called fossils.	
17	Shell endocast	Fossil	Trace Fossil	This shell is a fossil. It shows evidence of life because the shell that belonged to the organism inside had to exist to produce this. An endocast is formed when something created by life (like a shell) is filled in with sediment. The sediment retains the shape of the shell, but not the shell itself.	This is a trace fossil because it implies that the organism was there.
18	Dinosaur Tracks (replica)	Fossil	Trace Fossil	The real tracks from which this replica was made are fossils. These tracks show evidence of life because they show that a living organism walked across this rock before it was hard. These tracks are from a theropod dinosaur.	This is a trace fossil because it implies that the organism was there.
19	Dinosaur Egg Shell	Fossil	Body Fossil	These pieces of dinosaur egg shell are fossils. They show evidence of past life because they are pieces of the eggs from which once living dinosaurs hatched. These fossilized egg shells are likely from the eggs of <i>Maiasaura</i> or <i>Troodon</i> .	This is a body fossil because it is retains actual remains of the animal.