

## Be a Scientist! Be an Engineer!

Choose one type of fruit and collect two very similar samples of it. Design a test to see how one sample changes over two weeks when it is buried in soil (like a fossil). You might measure the sample's size or weight before and after being buried. What other changes might you notice and record? Decide what kind of soil to use, such as potting soil, sand, or dirt. Make a hypothesis, record data, and analyze your results.

Now, design a solution to better preserve the fruit when it is buried. Make a plan, build the design, and test it. Bury your protected fruit and see what happens. Were the results different?

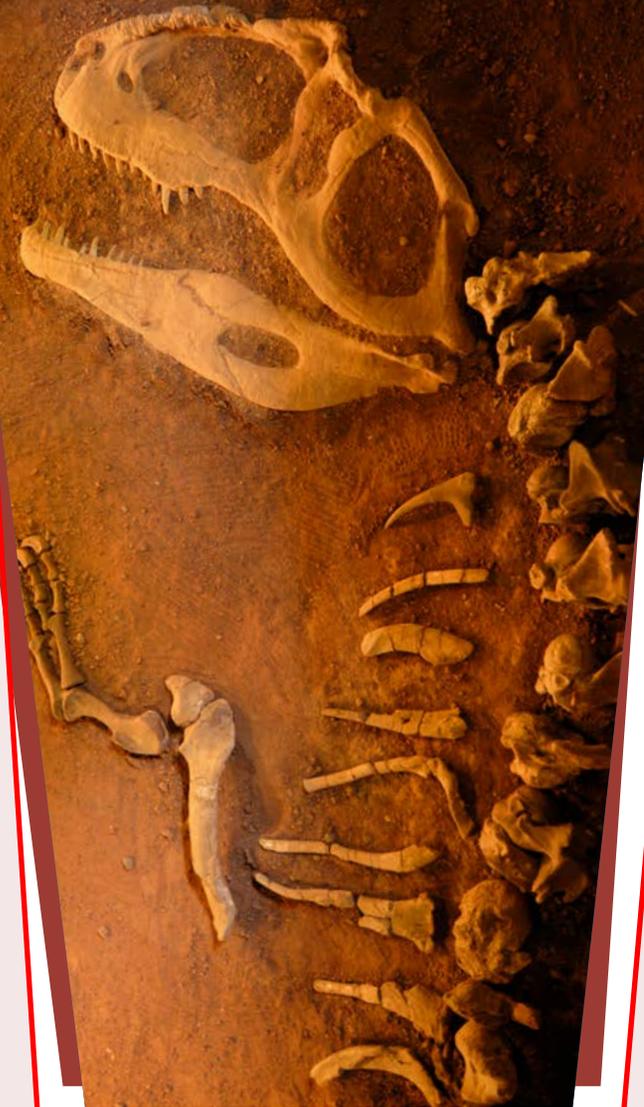


### Beyond the Book

Do an Internet search for the oldest fossil of a living thing of your choice.

FOCUS Book

# FOSSILS



: Science A-Z 🌐

# FOSSILS

## FOCUS Question

What can fossils tell us about animals and plants that lived long ago?

Patterns

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Fossils

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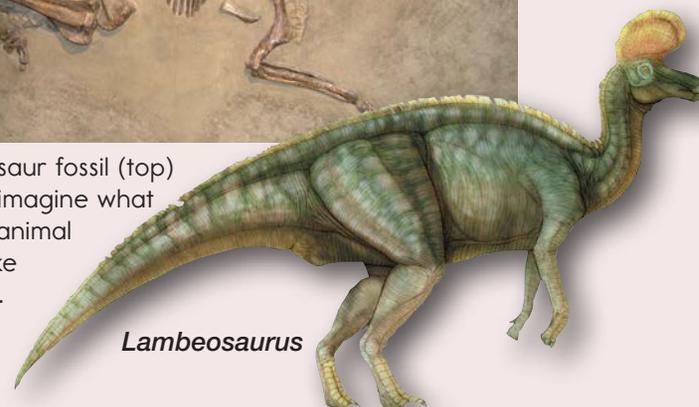
## What Is a Fossil?

How do we know dinosaurs existed? In fact, how do we know anything about ancient plants and animals? We can look at rocks! Not just any rocks, though. We look at *fossils*.

A fossil is anything left from an ancient living thing. It might be an animal's whole body, or just one part. It might be a nest full of eggs. It might be the shape of a leaf or animal footprints. It might even be really old poop! Fossils can teach us about plants and animals that lived a long time ago.



This dinosaur fossil (top) helps us imagine what the real animal looked like (bottom).



*Lambeosaurus*

## Kinds of Fossils

Most living things never become fossils. When they die, they get eaten or rot away. Once in a while, dead things are buried in the ground and slowly turn into rock. Over many, many years, they become fossils.

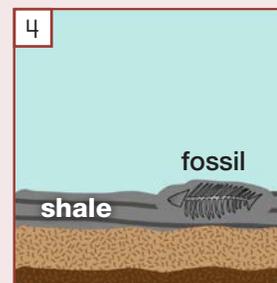
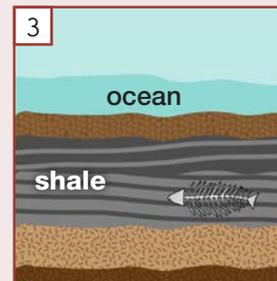
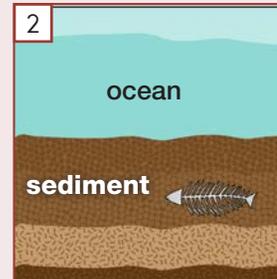
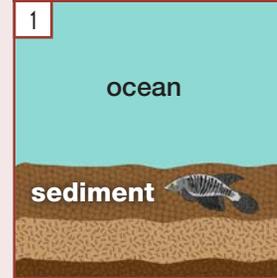
There are two main types of fossils: *body fossils* and *trace fossils*. A body fossil is a living thing, or part of a living thing, that has turned into rock. A trace fossil is often the shape of a living thing that has been pressed into the ground. Trace fossils can also be nests, footprints, or poop that a living thing left behind.



a coprolite (poop fossil)

## Bones, Teeth, and Shells

### HOW FOSSILS FORM



A body fossil forms when a dead thing gets buried under layers of *sediment*. Sediment is made of tiny bits of loose material. It can be moved by wind or water.

The hard parts of a dead thing are most likely to last and become fossils. That is why the most common body fossils are bones, teeth, shells, and the woody parts of plants.

The weight of the layers above slowly presses down on the sediment. The loose sediment becomes solid rock.

After thousands of years, all that is left of the dead thing is a fossil in rock.

## Fossil Myths



**Myth:** All fossils are from dinosaurs.

**Science:** Countless plants and animals, including insects, have become fossils. Some of the most common fossils are from snails, clams, and other sea creatures with shells.



**Myth:** Fossils are from animals or plants that do not exist anymore.

**Science:** We find fossils of lots of animals and plant species that are still alive today! This fish has lived on Earth for 400 million years. You can see a live fish or a fossil of one from long ago. It has not changed much in all that time!



a coelacanth fossil

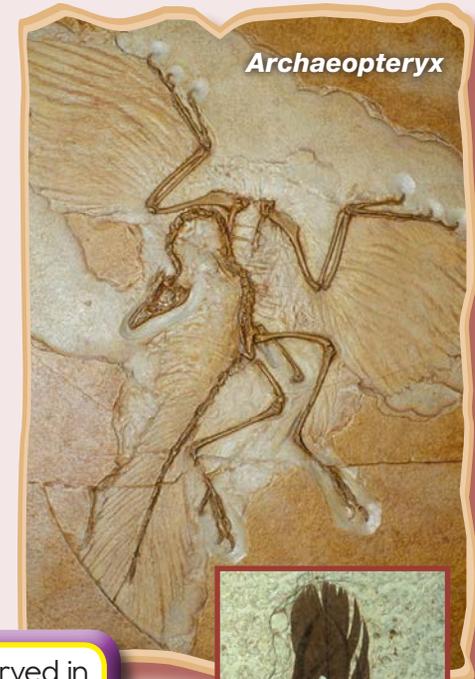


a living coelacanth

## Feathers, Fur, and Skin

How do we know what ancient animals looked like? Changing to rock usually destroys the soft parts of dead things. Sometimes the outside of an animal turns into a fossil. *Paleontologists*—scientists who study fossils—have found ancient feathers, fur, and even skin. These fossils are very special. They can tell us what an ancient animal looked like.

This is a fossil of one of the first birds. Scientists have found fossils of these birds' feathers.



Archaeopteryx

### Do You Know?

Not all fossils are preserved in rock. Sometimes a dead plant or animal gets preserved in tree sap or in ice.



Mammals such as rats have hair or fur. Some fossils of mammals include their fur.

Usually the color of an animal or plant fades away when it turns to rock. New ways of studying fossils might let us find out what color they were. Scientists could one day find out that some dinosaurs had purple skin or green spots!



## Leaving an Impression

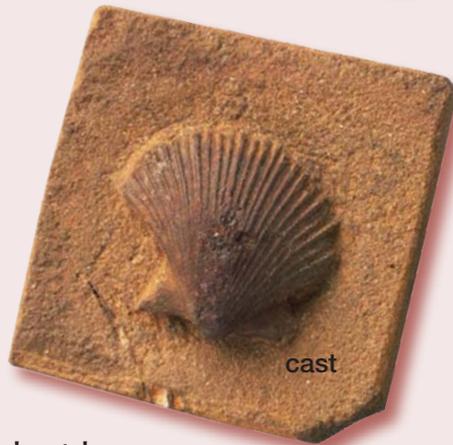
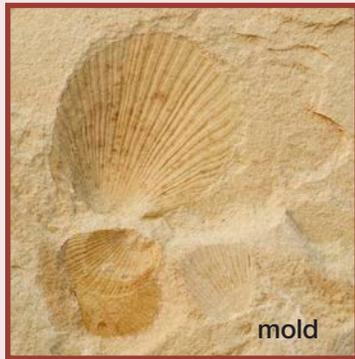
Trace fossils can give us a “picture” of a living thing’s size and shape when it was alive. Trace fossils form after a plant or animal’s shape is pressed into mud. Then it turns into rock.



Footprint fossils can tell us how an animal moved. Did it slither, hop, or walk? Did it drag its tail on the ground? Footprints can also tell us if an animal traveled alone or with a group.

Trace fossils of plants can tell us about Earth’s climate long ago. For example, paleontologists have found fossils of jungle plants in places that are now icy.





After a dead animal or plant leaves an impression, a hole will remain as the mud turns to rock. The hole takes the shape of the animal or plant. This kind of trace fossil is called a *mold*.

If that hole later gets filled in with other minerals, the fossil is called a *cast*. Once the outer rock is broken away, the cast remains. It looks like the original living thing, but it is made of minerals.

What can you discover by looking at fossils?



## Read-Think-Write

Write your answers on separate paper. Use details from the text as evidence.

- 1 Which dead thing is more likely to turn into a fossil: a plant that gets buried in mud, or a triceratops that gets eaten by a tyrannosaurus rex? Explain your answer.
- 2 Look at the diagram on page 4. In which pictures is the fossil being pressed down by layers above it?
- 3 Which of the following might scientists find out about an ancient animal by studying fossils of its poop?
  - A the color of the animal's skin
  - B what the animal ate
  - C how the animal moved
- 4 What is the difference between a *cast* fossil and a *mold* fossil?
- 5 Why is it difficult to know the color of animals that lived millions of years ago?

### **FOCUS Question**

What can fossils tell us about animals and plants that lived long ago? Compare the photo of a bird fossil on page 6 to a modern bird. Write about how they are similar.

