

Earth's History and Fossils

If you could cut a slice into Earth's crust, you would see layers of rock. Some layers might be made of sedimentary rock, some might be made of metamorphic rock, and some might be made of igneous rock. But no matter what the layers are made of, you can be sure of one thing. In general, the layers near the surface are younger than the layers farther down.

Each layer is like a page in a history book. The last page—the top layer—tells about the present. The first page—the bottom layer—tells about the distant past. In between, the pages fill in the history from past to present. The layers usually don't tell you exactly when an event took place in Earth's history. And they do not tell you the whole story. They only tell you the order in which some events took place.



A layer of sedimentary rock on top of a layer of igneous rock might tell you this: First there was a volcano here. It erupted, and lava hardened into igneous rock. Much later, an ocean covered the igneous rock. Sediments drifted to the ocean floor. Over millions of years, the sediments formed sedimentary rock that covered the igneous rock.

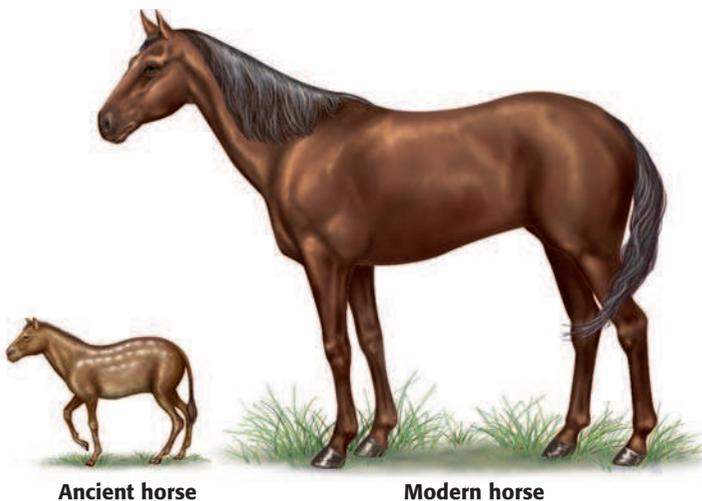
Fossils

Organisms have lived on Earth for at least 3.5 billion years. During that time, organisms and the environment have changed many times. Fossils hold clues to those changes. **Fossils** are the remains or traces of organisms that lived long ago.

Most fossils are found in sedimentary rock. The original organisms were trapped in sediments. When the sediments hardened into rock, signs of the organisms stayed in the rock.

Fossils Give Clues to the Environment Today, Antarctica is the coldest continent on Earth. About 35 years ago, scientists found fossils of trees and large animals in Antarctic rock. The trees and animals could only have lived in a warm climate. The fossils were about 250 million years old. That meant Antarctica had a warm climate at that time.

Fossils Give Clues to Organisms Fossils can show the history of an organism. For example, ancestors of today's horses lived about 50 million years ago. Fossils show that these animals were about the size of dogs. And they had four toes on their front feet instead of hooves.



The small animal was the ancestor of today's horses.

Kinds of fossils Fossils form in different ways. They also record different information about the organisms they preserve.



Whole insects were trapped in tree sap. The sap hardened into a substance called amber.



Footprints were preserved when a dinosaur or other animal walked in mud, and the mud hardened into rock. Footprints, tracks, and burrows made by organisms and preserved in rock are called **trace fossils**.

A **mold** is a space pressed into rock. When an organism died, its body lay on mud. The mud hardened into rock. The mold has the shape of the organism.



A **cast** is a mold that was filled in with minerals or grains of rock, then turned into solid rock.



A **petrified fossil** formed when the hard parts of an organism were replaced by minerals. The fossil looks like a bone or tree trunk, but it is made of rock.