

A Trip Through Earth's History

Section I: Fossils

Fossils serve as time capsules from Earth's ancient past, preserving clues about organisms that lived millions of years ago. A fossil is the preserved remains or traces of ancient living organisms. Most fossils form when an organism dies and becomes buried in sediment. Over millions of years, the sediment hardens into rock, and the remains gradually transform while still retaining the shape of the original organism.

Scientists have identified several types of fossils found within rock. These include molds, casts, petrified fossils, carbon films, and trace fossils. In some cases, the remains of organisms can also be preserved if they become trapped in amber, tar, or ice.

A **mold** is a hollow area in sediment that forms when an organism decays and leaves behind an impression of its shape. If minerals or sediments later fill in that hollow space, a cast forms. A **cast** is a solid copy of the organism's shape. **Petrified fossils** form when minerals slowly replace all or part of an organism's structure, turning it into stone. Another type of fossil is a **carbon film**, a thin coating of carbon left on rock that preserves the outline of an organism. While many fossils preserve the shapes of organisms, **trace fossils** record the activities of ancient life rather than the organism itself. For example, a fossilized footprint is a trace fossil because it shows evidence of an organism's movement.

The study of fossils helps scientists understand the history of life on Earth. A scientist who studies fossils is called a **paleontologist**. Paleontologists collect, study, and classify fossils to learn about organisms that lived long ago. The information gathered from fossils is known as the **fossil record**. This record provides evidence of how different groups of organisms have changed over long periods of time. It also provides scientists with valuable clues about Earth's past climates, environments, and surface changes.

The fossil record also provides important evidence for the theory of **evolution**, which describes how living things gradually change over long periods of time. Fossils help scientists see how new species appeared while others disappeared. The fossil record clearly shows examples of **extinction**, which occurs when a species no longer exists and will never live again. Together, these discoveries reveal how life on Earth has changed and adapted throughout Earth's long history.

Review:

1. Define fossils.
2. Explain the difference between a mold and a cast fossil.
3. Explain evolution.

