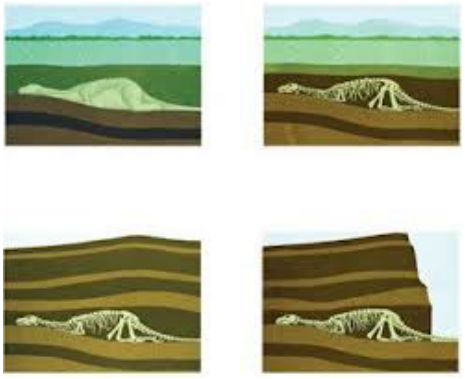
# Fossils



**Fossils** are the preserved remains or traces of ***living*** things. Fossils provide clues as to how life has changed over time. Most fossils form when living things die and are buried by sediments. The sediments slowly harden into sedimentary rock and preserve the shapes of the organisms. Fossils are usually found in this type of rock.

Most fossils form from animals or plants that once lived in or near quiet water such as swamps, lakes, or shallow seas. When an organism dies, generally only its hard parts leave fossils. Fossils found in rock include **molds** and **casts**, **petrified or permineralized fossils**, **carbonized fossils**, and **trace fossils**. Other fossils form when the **original remains** of organisms are **preserved** in substances such as tar, amber, or ice.

**Mold and cast**

The most common fossils are ***molds and casts***, which are copies of the shapes of ancient organisms, and contain details as to what they looked like. A **mold** is a hollow area in rock in the shape of an organism or part of an organism. A mold forms when the hard part of an organism, such as a shell, is buried in sediment. Later, water carrying dissolved minerals may seep into the empty space of a mold. If the water deposits the minerals there, the result is a **cast,** a solid copy of the shape of an organism.

**petrified or permineralized fossil of wood**

**Petrified** or **permineralized** fossils are fossils in which minerals replace all or part of an organism, thus making them rock-like.

**carbonized fossil or carbon film**

Another type of fossil is a **carbonized fossil** which is sometimes called a **carbon film**, because it is an extremely thin coating of carbon on rock. Everything that lives contains some amount of carbon in them, thus when an organism dies their body will sink into the earth's layers, decompose, and will leave a thin layer of carbon showing the body's characteristics. Usually this type of fossil will focus on the evidence of the delicate parts such as plant leaves and insects.

**Trace fossil**

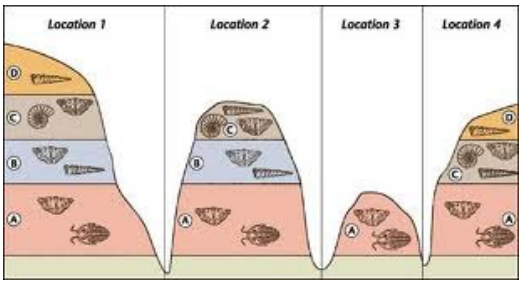
**Trace fossils** provide evidence of the **activities** of ancient organisms. Fossil footprints, trails, and burrows are examples of **trace** fossils. The organism doesn't have to die to leave his trace . By observing trace fossils, scientists can use inference to determine an animal's size and behavior, whether it walked on two legs or four legs, or it lived alone.

**Wooly mammoth found in ice**

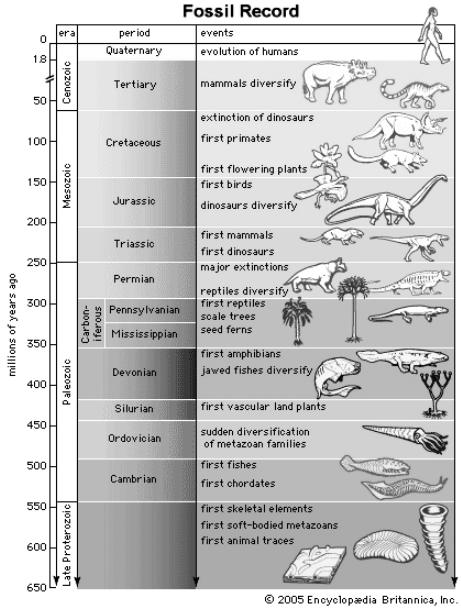
Some processes preserve the remains of organisms with little or no change. These fossils are called **preserved fossils**, or **originals remains**. Organisms can be preserved in tar, amber, or ice.

**Preserved fossil also called original remains, of an insect in amber**

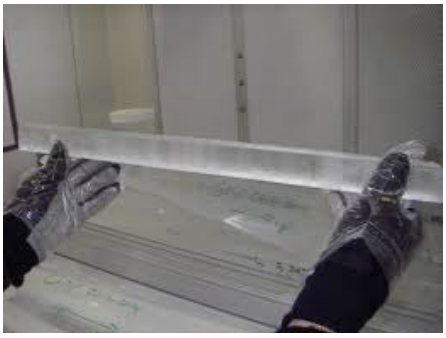
When certain fossils are used to help determine the age of rocks or other fossils, it is called an **index fossil**. Index fossils are used to compare, or correlate, rocks exposed in separate locations. Index fossils can be any of the 6 fossils already mentioned- molds, casts, preserved remains, petrified remains, trace, and carbon film.




Scientists who study fossils are called **paleontologists**. Paleontologists collect and classify fossils on similarities and when they lived. Together, all the information that paleontologists have gathered about past life is called the **fossil record**. The fossil record is used to explain the history of life on Earth. The fossil record can show that groups of organisms have changed over time. It reveals that fossils occur in a particular order, which may be inferred that life on Earth has evolved, or changed. Thus, the fossil record provides evidence to support the theory of evolution. A **scientific theory** is a well-tested concept that can try to explain a wide range of observations. **Evolution** is the gradual change in living things over long periods of time. The fossil record shows that millions of types of organisms have evolved. Some have become extinct. A type of organism is **extinct** if it no longer exists and will never again live on Earth.




Paleontologist use fossils to try to provide evidence of Earth's climate in the past. Fossils can also be used to learn about past environments and changes in Earth's surface. For example, what did scientists think about the surface of the Earth when seashell molds and casts were found on mountaintops?



**Ice core**

Ice cores are another thing that scientists use to learn about Earth's past environment even though ice can't be classified as a fossil because it was never alive. An **ice core**, which is a tubular sample drilled from places like the polar ice caps, Antarctica, Greenland or glaciers, shows the layers of ice and snow that have built up over thousands of years. Scientists can learn a lot about ancient climates, including changes in temperature, $CO_2$ concentration, and if there were volcanic eruptions, all based on air, dust, or ash trapped in the ice.

Name_____ **Fossils**

1. The preserved remains or traces of living things are called _____

2. Fossils can give us clues as to _____.

3. Describe the steps as to how most fossils are form.

A. _____

B. _____

4. What type of rock are fossils usually found? _____

*Why not igneous or metamorphic rock? (previous knowledge*)

_____

5. What is sedimentary rock made of?_____

6. ***What do you think?*** Why do only the hard parts of organisms generally leave fossils?

_____

7. Circle the letter of each sentence that is true about molds and casts
   a. Molds and casts both copy the shape of ancient organisms.
   b. A mold forms when the hard part of an organism is buried in sediment.
   c. A cast is a hollow area in sediment in the shape of an organism.
   d. Molds and casts do not show details of the organism's structure.

8. What is another name for a petrified fossil? _____.

9. How are the fossils in question 8 formed?_____

_____

10. What is a carbon film? _____

11. True or False? A carbon film forms when minerals preserve the delicate parts of an organism.

12. Circle the letter of each trace fossil.

a. footprints b. animal trails c. animal shells c. burrows

13. What can a scientist **infer** by looking at fossil footprints?

_____

_____

14. True or False? Fossils can form only when the remains of an organism decay.

15. Preserved fossils are also called _____.

16. A. What are three substances in which the remains of organisms have been preserved?

a. _____ b. _____c._____

17. Give an example of a preserved fossil. _____

18. A type of fossil that is used to help date layers of rock and/or other fossils is known called

an _____ _____

19. True or False? Index fossils are very different from all the other fossils.

20. Scientists who study fossils are called _____.

21. True or False? Paleontologists classify organisms based on their similarities and when they lived.

22. All the information that paleontologists have gathered about past life is called the

_____.

23. The fossil record shows a. _____

and b. _____

24. The fossil record is used to support the theory of evolution. What is evolution?

_____.

25. What is a scientific theory? _____

_____

26. type of organism that no longer exists and will never again live on Earth is _____.

27. Paleontologists use fossils to try to provide evidence of

a. Earth's _____ in the past

b. Earths _____ in the past

c. _____ in the Earth's _____

28. ***What do you think?*** What does the presence of seashell molds and casts on mountaintops tell you about the surface of the Earth? _____

29. What is an ice core? _____

30. True or False? An ice core is a fossil.

31. What can ice cores tell scientists about the past environments?

_____

_____