

SECTION 4 - 1

SECTION SUMMARY

Fossils

Guide for Reading

- ◆ How do most fossils form?
- ◆ What do fossils tell about how organisms have changed over time?

Fossils are the preserved remains or traces of living things. Fossils provide evidence of how life has changed over time. **Most fossils form when living things die and are buried by sediments. The sediments slowly harden into rock and preserve the shapes of the organisms.** Scientists who study fossils are called paleontologists. They usually find fossils in **sedimentary rock**, the type of rock that is made of hardened sediment.

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 become fossils. **Fossils found in rock include petrified fossils, molds and casts, carbon films, and trace fossils. Other fossils form when the remains of organisms are preserved in substances such as tar, amber, or ice.**

Petrified fossils are fossils in which minerals replace all or part of an organism. The most common fossils are molds and casts. A **mold** is an empty space in sediment 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**, an exact copy of the shape of an organism. Another type of fossil is a **carbon film**, an extremely thin coating of carbon on rock. **Trace fossils** provide evidence of the activities of ancient organisms. Fossil footprints, trails, and burrows are examples of trace fossils. Some processes preserve the remains of organisms with little or no change. Organisms can be preserved in tar, amber, or ice.

Paleontologists use the fossils they collect to determine what past life forms were like. Together, all the information that paleontologists have gathered about past life is called the fossil record. **The fossil record provides evidence that many different organisms have existed at different times. The fossil record also shows that groups of organisms have changed over time.** It also reveals that fossils occur in a particular order, showing 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 explains a wide range of observations. **Evolution** is the process by which all the different kinds of living things have changed 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 exist.

Fossils provide evidence of Earth's climate in the past. Paleontologists also use fossils to learn about past environments and changes in Earth's surface.

SECTION 4-1 REVIEW AND REINFORCE

Fossils

◆ Understanding Main Ideas

Fill in the blanks in the table below.

Type of Fossil	Description
Petrified fossil	Fossils in which 1. _____ replace all or part an organism
2. _____	An empty space in sediment in the shape of an organism
3. _____	An exact copy of the shape of an organism
Carbon film	An extremely thin coating of 4. _____ on rock
Trace fossils	Evidence of the 5. _____ of ancient organisms
6. _____	Remains of organisms in tar, amber, or ice

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Answer the following questions on a separate sheet of paper.

- 7. Describe how a mold is related to a cast.
- 8. What can a paleontologist tell from fossil footprints of a dinosaur?
- 9. What does the fossil record reveal about the evolution of life on Earth?

◆ Building Vocabulary

Fill in the blank to complete each statement.

- 10. The process by which all the different kinds of living things have changed over long periods of time is called _____.
- 11. The type of rock that is made of hardened sediment is called _____.
- 12. A type of organism is _____ if it no longer exists and will never again live on Earth.
- 13. A(n) _____ is a scientist who studies fossils.
- 14. The preserved remains or traces of living things are called _____.
- 15. A well-tested concept that explains a wide range of observations is called a(n) _____.