

Organisms of Long Ago

S.O.S.

Lesson 11: When Environments Change

When Environments Change

SPI.03.07.5.2

Getting the Idea

You have learned that living things have features that help them survive in their environment. But environments change. What happens to living things in places that change?

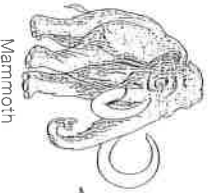
Key Words
extinct
endangered
threatened
thriving

Gone Forever

Animals called mammoths once lived in many cold parts of the world. Mammoths were related to today's elephants. They had thick, shaggy hair that kept them warm. They had large, flat teeth for eating tough grasses.

Then their environment changed. It became warmer. Forests grew. Trees crowded out grasses that mammoths ate. Many scientists think these changes caused mammoths to die out. Now mammoths are **extinct**—no longer found living on Earth. A group of living things is **extinct** when all its members have died. When a kind of living thing becomes extinct, it is gone forever.

Dinosaurs are another group of extinct animals. Once millions of dinosaurs lived on Earth. Then their environment changed. Scientists think a giant piece of rock from space hit Earth. Clouds of dust filled the air. Little sunlight could get through. Much of Earth became colder. Plants died because they could not make food.



Mammoth



Dinosaur

Earth's environments changed many times in the past. Many kinds of living things became extinct. Today, environments are still changing. And plants and animals are still becoming extinct.

Not Gone but in Danger

Living things that could become extinct soon are called **endangered**. The white rhinoceros and the tiger are endangered. There are fewer and fewer of these animals each year.

The number of northern spotted owls is also dropping. They could become endangered soon. They are said to be **threatened**. Some other animals that are threatened today are the gray wolf and the polar bear.

Animals or plants that are doing well are called **thriving**. About 100 years ago, elephant seals were almost extinct. But their numbers grew again, and today they are thriving.

People Cause Changes

Events in nature cause living things to become extinct. But so do people. People may hunt a kind of animal until it is gone. Some scientists think that hunting helped make mammoths extinct. Today, hunting endangers the white rhinoceros and the tiger.

People change environments. People cut down forests to make room for farms, roads, and towns. Then some forest animals may not survive. Farmers use chemicals to kill insects that eat crops. The chemicals may endanger other animals and plants.

People also try to protect living things. In India, it is against the law to hunt tigers. In the United States, farmers today cannot use certain chemicals. Many other rules and laws protect living things that are threatened or endangered.

Fossils—Clues to the Past



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Getting the Idea



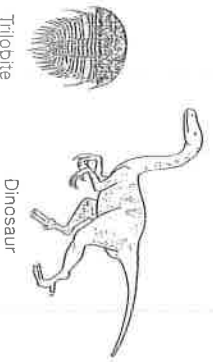
Key Words

fossil
rock
mineral

Millions of kinds of plants and animals lived at different times in the past. How do we know about living things of long ago? Scientists study clues that they find in rock.

Extinct Animals and Plants

In Lesson 11, you learned about living things that are extinct. You learned that dinosaurs are one group of extinct animals. Once there were many dinosaurs. Now no dinosaurs are left.



Trilobite

Dinosaur

Trilobites are another group of extinct animals. They were small sea animals. They lived a very long time ago, before the dinosaurs. Many plants, such as giant ferns, also became extinct.

Learning from Fossils

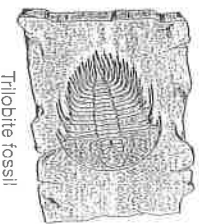
Dinosaurs, trilobites, and many other living things died out before the first humans lived. If no person ever saw them, how do we know about them? We know about them from fossils. A **fossil** is the preserved remains or trace of a living thing from long ago.

Most fossils are found in rock. **Rock** is a solid material made up of minerals. A **mineral** is a natural material that was never alive.

Long ago, layers of mud and sand covered dead plants and animals. Over millions of years, the **layers** turred into rock. You will learn more about how rock forms in Lesson 16.

The soft parts of the dead plants and animals rotted away. **Hard parts**, such as bones and teeth, lasted longer. **Minerals** slowly took the place of these remains. The minerals formed hard fossils. The dinosaur bones you see in a museum are not really bones. They are fossils made of minerals.

People have found fossils of tree trunks. After the trees died, minerals took the place of the wood. Scientists have learned about very old forests from these kinds of fossils. Some fossils show the whole shape of a living thing. The fossil on the left below shows the shape of a trilobite.



Trilobite fossil



Footprint fossil

Some fossils show the shape of a part, such as a leaf or a feather. Some fossils are animal tracks. Dinosaurs left footprints like the one on the right above.

Some fossils are not made up of minerals. Instead, these fossils are preserved bodies. People have found mammoths frozen in ice or buried in tar. Insects have been found in hardened tree sap, called amber.