

Vocabulary

fossil p. 248

dinosaur p. 250

extinct p. 252

Find out what these words mean as you study this lesson.

**Essential Question**

What Can We Learn from Fossils?

Engage

Get Ready to Learn What questions do scientists ask about fossils? Where do they look for fossils? What can scientists learn from fossils? A scientist uses a brush to clean soil from a rock. She uncovers a shape in the rock. It looks like part of an animal. What part is it? What did it belong to? How did it live?

Try This! What would you do if you found a fossil? What would be your first question? Get a fossil or picture of a fossil from your teacher. Look at it carefully. How do you know that it is a fossil and not just a rock? Draw what you think the organism looked like when it was alive.





Structured Inquiry

Discover

Record your work for this inquiry. Your teacher may also assign the related Guided Inquiry.



Tracking Clues

What can you learn about an object from the tracks it makes?



Your Group Needs

- flour
- black paper
- three wind-up toys or three model cars

Step 1 Spread a thin layer of flour on a sheet of black paper.

Step 2 Use wind-up toys or model cars to make tracks in the flour. **Observe** and draw the tracks made by each object.

Step 3 Investigate another group's tracks. What can you **infer** about the objects that made the tracks?

Step 4 Ask the group if you were correct.

Create Explanations

1. What can you learn about an object from the tracks it makes?
2. Are there different ways of interpreting the clues? Explain.
3. What other objects could you use to make tracks so you could study them more easily?

Fossils

Explain

Scientists want to learn about life on Earth long ago, so they dig for fossils. A **fossil** is what is left from a living thing that died long ago.

Most fossils are found in layers of rocks. Most form after a plant or an animal dies and is covered rapidly with dirt and sand. Layers of dirt and sand turn to rock over many years. No one knows for sure how fossils got where they are found. All scientists who study fossils try to explain what they find. Many scientists who are Christians do this too, but they use what the Bible says along with the facts they find.



What kind of animal do you think made this fossil?



Not all Christian scientists agree about how or why things happened. But they do know that scientific ideas change all the time and God's Word never changes. These scientists do not let the current limits of science understanding affect their belief in the Bible.

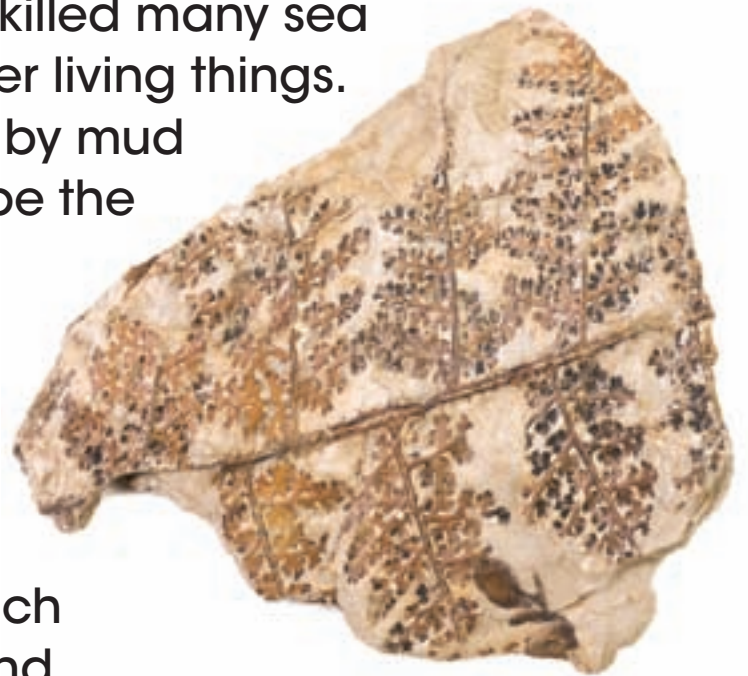
Many Christians believe that most fossils and layers of rock were formed by the Flood. The Bible says that the Flood killed all land animals that were not on the ark. It probably also killed many sea animals, plants, and other living things. These organisms buried by mud during the Flood could be the fossils we find today.

Animal fossils include bones, teeth, feathers, and shells. These may be replaced by stone. Marks left by animals, such as tracks, are another kind of fossil. Plant fossils include leaves, twigs, and flowers.



Think About It

How are all fossils alike?



This fern fossil was found in West Virginia. It looks like it was made from a fern similar to a golden tree fern found in New Zealand.

Dinosaurs **Explain**



Scripture Spotlight

Read Job 40:15.
What do you think it describes?







Dinosaurs were reptiles that are now extinct. Most dinosaurs were normal-sized creatures and huge ones were the exception, just as elephants and giraffes are exceptional today. Dinosaurs appear to have been mostly vegetarian and are not the largest creatures known to exist. Scientists learn about dinosaurs from fossils. Fossils tell scientists dinosaurs' lengths and the shape of their teeth. Scientists infer the dinosaurs' weights, how they moved, and what they ate. Their colors are only a guess. As scientists gather evidence, their views of dinosaurs change.

Explore-a-Lab

Guided Inquiry

 **How do the sizes of some dinosaurs compare?**

The length of an iguanodon was about 9 m (30 ft). The length of a velociraptor was about 3 m (10 ft). A compsognathus was a meter or less in length. With a partner, decide how to measure these lengths and display them side by side.

Name	Speed and Number of Legs They Walked On	Teeth and Food	Unusual Features
Apatosaurus 	slow; 4 legs	peg-like; plants	was one of the largest dinosaurs
Spinosaurus 	fast; 2 legs	sharp; meat	had a sail-like fin on its back
Triceratops 	slow; 4 legs	teeth for cutting and grinding on sides and back; plants	had 3 horns and a bony plate on its head
Velociraptor 	fast; 2 legs	sharp; meat	had deadly claws and fast-moving legs
Stegosaurus 	slow; 4 legs	small teeth with bumps; plants	had spikes on its tail and plates on its back
Carnotaurus 	slow; 2 legs	sharp; meat	had two bull-like horns near its eyes



Check out your **Science Journal** for a Structured Inquiry to find out more about dinosaurs and how we use fossils to learn about past life.

Discover



Think About It

How are the teeth of meat-eaters different from the teeth of plant-eaters?

The End of Dinosaurs Explain



Faith Connection

Many Christians believe that fossil evidence that scientists find supports the story of the Flood found in the Bible. They believe the Bible is true and that this evidence shows that Earth is not as old as many believe.



Think About It

Why is no one sure what caused dinosaurs to become extinct?

Groups of animals and plants that have all died are **extinct**. They are gone forever. Dinosaurs are extinct. Many other animals and plants became extinct at the same time dinosaurs died out. No one is sure what caused so many organisms to become extinct. Some scientists think a meteorite, or rock from space, hit Earth. Others think a huge volcano erupted. Some believe these events happened at the same time!

Genesis 7 tells about violent events during the Flood. Could these events have caused the extinction of the dinosaurs? Many Christians believe the Flood produced many fossils, including dinosaurs, that we find today. Christian scientists use the clues given in the Bible to interpret what they learn from fossils.

The Genesis Flood may explain why dinosaurs are extinct.



Make a Connection **Extend**

Design five dinosaur trading cards. Draw and color pictures of dinosaurs on the front side, along with their names. On the back write four facts about the dinosaurs. Trade with classmates and learn about their dinosaurs, too.

Lesson Review **Assess/Reflect**

Summary: **What can we learn from fossils?** Fossils are evidence of things that lived long ago. Some fossils are found in rock layers. Scientists use them to learn what Earth was once like.

- 1. Graphic Organizer** Make an idea web. Tell what we can learn from fossils.
- 2. Vocabulary** What is an **extinct** animal?
- 3. Test Prep** Which is the first step in a fossil being formed?
A. The layers change to rock. **C.** A scientist finds its bones.
B. The animal dies. **D.** A scientist brushes off soil.
- 4.** What can scientists learn by studying fossils?
- 5.** What clues does the Bible give us about the formation of fossils?



Family Link Go on a city fossil hunt. Look for fossils in the rocks used to build public buildings. Draw pictures or take photos.

Careers in Science

Extend

Paleontologist

A paleontologist studies fossils. A fossil is evidence of a living thing from long ago.

Paleontologists use shovels, brushes, and drills to gather rocks that contain fossils. They carefully chip away at the rock to expose fossils.

By studying fossils, paleontologists can learn about what Earth was like a long time ago.



Geologist

Geologists also study rocks. They study Earth and everything about it. They learn about how Earth formed and how Earth is changing.

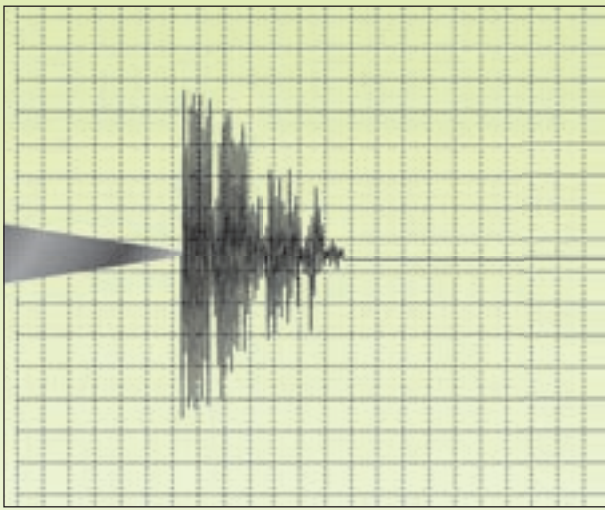
Geologists also study fossil fuels. Oil, coal, and natural gas are fossil fuels.

Geologists learn about Earth to help people. They work to predict events such as landslides and volcanic eruptions. This can help keep people safe.



Concept Check

1. Why do paleontologists need shovels, brushes, and drills to do their work?
2. How are the jobs of geologists and paleontologists the same? How are they different?



Seismograph

A seismograph is a tool that records the strength of earthquakes. It records the movement of Earth during an earthquake.

It draws lines on paper to show how much Earth shakes. Longer lines show more shaking. Shorter lines show less shaking. These measurements help scientists learn about earthquakes.

Weather Balloon

Almost 900 weather balloons are released two times every day. The balloons are filled with gas that makes them rise in the air.

Each balloon carries scientific tools. The tools record weather information such as the temperature. They send the information back to scientists.

The scientists use the data to forecast the weather.



Concept Check

1. Why would scientists put a seismograph in a stone building?
2. Why do you think it is important to release all the weather balloons at the same time?