

Essential Question

What Can We Learn from Fossils?

Engage

Use this page and the Try This! activity to engage students, determine what students know about fossils, and have them predict what they would do if they made a fossil discovery.

Get Ready to Learn

What questions do scientists ask about fossils? Where do they look for fossils? What can scientists learn from fossils? Ask students if they have ever found interesting rocks, shells, or bones at the beach or when digging in the park or around their home. Have volunteers share their experiences. Explain that these objects might be clues to all kinds of organisms that lived long ago. Point out that scientists study evidence of once-living things to learn about Earth's history.

Try This!

What would you do if you found a fossil? What would be your first question? Collect photos of fossils from the Internet or purchase inexpensive fossil kits or models in classroom quantities. Provide student pairs with a photo or model fossil and a hand lens. Encourage students to discuss what questions they want answers to before they begin looking for clues. Have students share their drawings with their classmates. The Roadside Geology series of books is a great resource for background information. You could also contact local universities for help in finding fossils in your area.

Vocabulary

Preview Vocabulary Ask students to make a three-column chart with the headings, *Word*, *Possible Meaning*, and *Definition*. Then, have students fill in the first two columns. They should complete the third column with the correct definitions as they read the lesson.

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.

Science Background

Scientists who find and study fossils are called paleontologists. Paleontologists learn about past life on Earth by looking at fossils and interpreting what they see. They spend time outside in remote locations hunting for fossils. They use tools such as drills, picks, and chisels to get fossils out of the ground. Then they clean them using dental picks, toothbrushes, and other small brushes. Paleontologists may use microscopes to examine and identify fossils. As they are doing all this, they keep records of their findings. They may also mark the locations of their findings on maps.

Some important paleontologists include William Smith, Georges Cuvier, Edward Drinker Cope, Mary Anning, Louis Agassiz, Louis Leakey, and Roy Andrews. Elaine Kennedy is a highly respected Adventist paleontologist.



Structured Inquiry

Discover

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

Science



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?

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Discover

Use the inquiry activities as an opportunity for students to perform hands-on investigations and think like a scientist.



Structured Inquiry

Tracking Clues

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

Preparation and Tips

You may want to use black paper from a roll and spread enough of it on the floor so different groups can work in different areas. To avoid having students get flour on themselves and all over the classroom, provide mats for them to kneel on and plastic gloves. The wind-up toys or model cars should be different sizes and shapes.

Predict What kind of clues will the tracks provide?



Have students use their *Science Journals* to record their work for this inquiry.

Inquiry Practice Tip

Investigate Explain to students that when they investigate, they think of ways to change what they are doing and then, try them out.

Expected Results

Students should see that different objects make different tracks. When changes are made to the way things are moved, the tracks may change.

Create Explanations

1. Sample answer: how fast or slow it's moving or the direction it is traveling and clues to its size
2. Sample answer: Yes, the clues could show how big the object is by how far apart the tracks are.
3. Sample answer: Plastic animals could be used.

Inquiry Extension

More Clues from Model Fossils



Guided Inquiry

How can you make a model of a fossil?

Extend the Structured Inquiry by having students make a model of a fossil using modeling clay, natural objects, and classroom objects.

Teaching Tip Have students collect several objects, oil the bottoms of the objects so they don't stick, and then place them in the clay. Then, have students determine what object made each impression.

Students may record their work in their *Science Journals*. A scoring rubric can be found as an *Online Teacher Resource*.

Explain

Fossils

Objectives

- Explain what a fossil is.
- Explain that scientists use fossils to learn about living things from the past.
- Identify different kinds of fossils.
- Explain how fossils provide evidence of the Genesis Flood.

Set Goals

As students study this lesson, ask them to point to the sentences that describe Adventist beliefs about fossils.

Develop Key Vocabulary

fossil Explain to students that the word *fossil* comes from the Latin word *fossilis*, which means “dug up.” Ask them how this fits with the definition of *fossil*. While most fossils are found in the ground, any trace of an ancient living thing is a fossil.

Teach Science Concepts

Help students understand why older layers are below newer layers. The order of the rock layers tells us the sequence of burial.

Some paleontologists attempt to determine relative age from rock layers. They use the order of rock layers to make inferences about the age of each layer relative to those above and below. When they assign absolute ages to the layers using techniques such as radiometric dating that suggest the layers are millions of years old, their interpretation of the history of life on Earth is based on different assumptions and may differ from the evidence presented in the Bible. **What can scientists learn about plants and animals that were deposited at the same time long ago?** Answers will vary. Scientists can learn about the events that deposited the sediments. They can see what life forms were like at that time.

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?



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Writing Link

Ask students to write and illustrate a story about a plant or animal that dies and becomes a fossil. They may wish to write from the point of view of the once-living thing. Remind students that stories have a beginning, a middle, and an ending; have complete sentences; and have correct spelling, punctuation, and grammar.

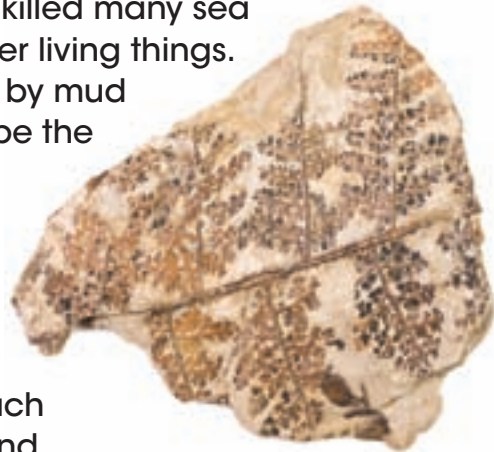
Suggest students first plan the story using a graphic organizer. Tell them that the story should begin with the plant or animal's death and what happens as it becomes a fossil. Students' stories should also tell about the fossil being found and any experiences after that. The ending should tell where the fossil is now.

Have students share their stories. Then, assemble them into a classroom book.

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.




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.



How are all fossils alike?

Understand Visuals

 **What kind of animal do you think made this fossil?** The fossil is a sea turtle.

Teach Science Concepts

What do layers of rock and the fossils in them have in common? They were both deposited at the same time under similar circumstances.

How is the study of rocks helpful when learning about plants and animals from long ago? The kind of rock fossils are found in helps us understand the conditions in which the organism died. For example, a land animal found in rock formed from water-borne sediment probably didn't live in a river, lake, or ocean. It may have been washed in and buried during a flood. Maybe it drowned as part of the catastrophe that buried it.

Tell students that there are many types of fossils. Point out that not all fossils are made the same way. Some look like there is a flattened image of a plant or an animal in a rock. These formed as sediment buried living things and turned to rock. Other fossils might be found frozen in ice or inside amber. Amber is a substance that forms when tree sap hardens. An insect that is trapped in sap could be preserved inside amber. Other fossils, such as petrified wood, form when hard minerals replace the organic parts of a living thing.

Ask students to think back to the Structured Inquiry activity. Explain that tracks are trace fossils. They are marks left by animals.

How do you think fossils of tracks were made? Answers will vary. They were made in mud or soft dirt that later became rock. To illustrate how sediment is turned into sedimentary rock, take diluted white glue, mix it with sand, and let it dry for a few days. This shows the formation of sandstone by minerals that act to cement the grains of sand together.



Think About It

How are all fossils alike? They are evidence of plants or animals that lived in the past.

Scaffolded Questions

Help students understand about fossils.

Approaching Level Why do scientists study fossils? They study them to find out more about what Earth, plants, and animals were once like.

On Level Why are most fossils found in layers of rock? They were quickly buried by layers of sediment carried by water.

Above Level A scientist finds two fossils in the same layer of rock. One is a leaf. The other is tracks. What might the scientist learn? Sample answer: The leaf tells you that plants once lived in that area. The leaf and track together may show that the plant and animal were alive at the same time. The track can tell you about how the animal moved and about its size and shape.

Explain (cont.)

Dinosaurs

Objectives

- Identify different types of dinosaurs.
- Explain that scientists learn about dinosaurs by studying fossils.

Develop Key Vocabulary

dinosaur Explain that *dinosaur* means “terrible lizard.” Students can look up “dina,” “dyna,” or “dyno” in the dictionary to see how each Greek root is used in the English language. Have students find other familiar words, like *dynamo* or *dynamite*. Ask them what “dino” means in the word *dinosaur*.

Teach Science Concepts

How can fossils help scientists figure out where dinosaurs lived? Sample answer: Scientists use the location of fossils to figure out where dinosaurs may have lived.

Triceratops had bony plates, and iguanodon had spikes. What do you think they used these for? Sample answer: They may have used them for protection and cooling their bodies.

Explore-a-Lab Guided Inquiry

Practice: Measure Challenge students to decide on a way to show the relative size of the three dinosaurs provided. They may choose to use paper, tape, or string to demonstrate.

- 🔍 **How do the sizes of some dinosaurs compare?** Some dinosaurs were small and some were extremely large.



Scripture Spotlight

Read Job 40:15 with students. **What do you think it describes?** While it is not entirely clear, the passage could describe a dinosaur. The important message is that God created all things, including those we don't know much about.



Scripture Spotlight

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

Dinosaurs Explain

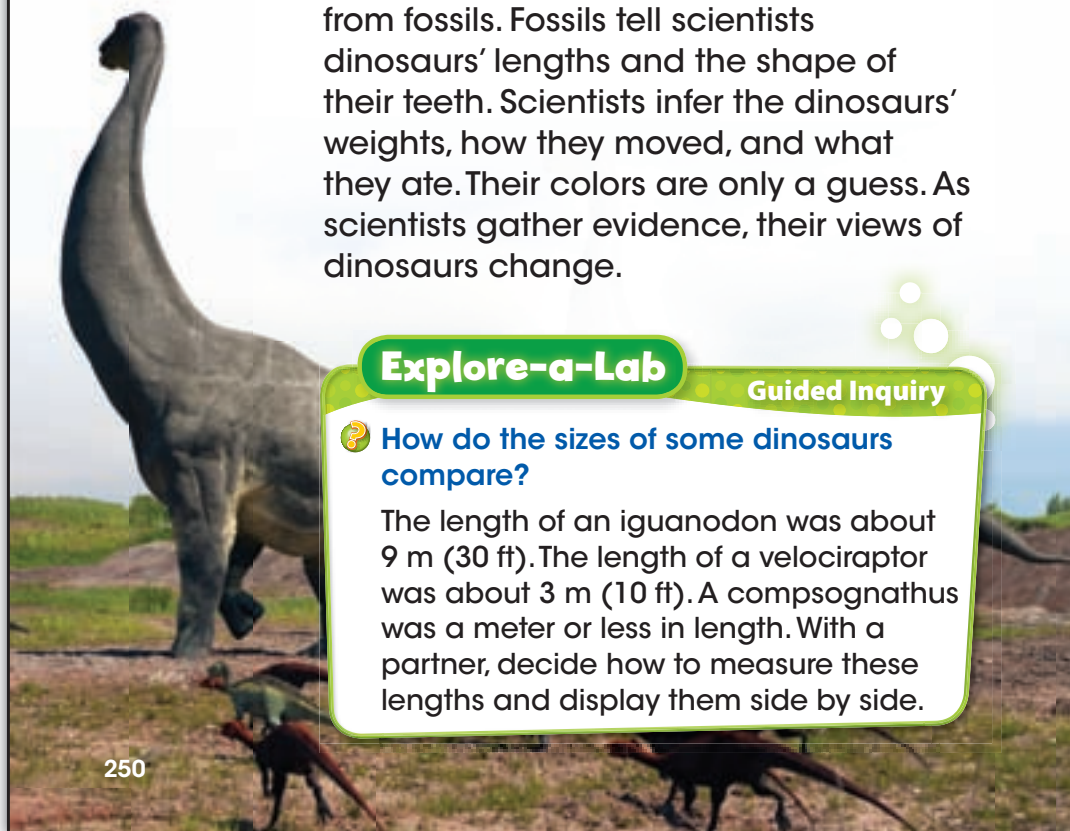
Dinosaurs were reptiles that are now extinct. Most dinosaurs were normal-sized creatures and huge ones were the exception, just as elephants and giraffes are exceptional today. Dinosaurs appear to have been mostly vegetarian and are not the largest creatures known to exist. Scientists learn about dinosaurs 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.









History of Science

During the late 1800s, North American discoveries of dinosaur fossils provided paleontologists with some of the best clues about life on Earth in the past. This was a time when many of the dinosaurs people are most familiar with were found and named.

In 1854, Ferdinand Hayden found dinosaur teeth while exploring the Missouri River. A few years later, a complete dinosaur skeleton was found in a sand pit in New Jersey. This skeleton helped paleontologists learn that some dinosaurs used only two legs to move. This was a major finding.

Other dinosaur fossils have been found in Colorado, Montana, New Mexico, Oklahoma, South Dakota, Utah, and Wyoming. Nevada has one of the largest deposits of ichthyosaur in North America.

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?



Think About It

How are the teeth of meat-eaters different from the teeth of plant-eaters? Meat-eating dinosaurs have sharp, knife-like teeth. Plant-eating dinosaurs have flat, rounded teeth.



Structured Inquiry

Discover

Dinosaur Digs

What can you learn from putting together a skeleton?

Preparation and Tips

Prepare the dinosaur bones master found as an *Online Teacher Resource*. Organize students in small groups.

Predict What do you think you will learn about your dinosaur?



Have students use their *Science Journals* to record their work for this inquiry.

Inquiry Practice Tip

Compare Explain that scientists compare findings with known information and their beliefs to make interpretations of their data.

Expected Results

Students should determine that the dinosaur is a meat-eater.

Create Explanations

1. They can tell us what the animals looked like and how they lived. We can tell how large they were and whether they ate plants or meat.
2. Sample answer: The bones were jumbled. There could be missing bones, or bones from other animals.
3. Sample answer: I think my dinosaur walked upright on two legs and ate meat.

English Language Learners

Assist with Comprehension The names of these dinosaurs are Latin words mostly based on Greek roots. Tell students that *saur* means "lizard." Have students make up their own dinosaur name.

Spinosaurus	(spyn•oh•SAWR•uhs)	"Spined Lizard"
Triceratops	(try•SAIR•uh•tahps)	"Three-horned Face"
Velociraptor	(vuh•LAH•sih•rap•tuhr)	"Fast Thief"
Iguanodon	(ih•GWAH•nuh•dahn)	"Iguana Tooth"
Carnotaurus	(kar•no•TAWR•uhs)	"Flesh-eating Bull"

Explain (cont.)

The End of Dinosaurs

Objectives

- Explain the meaning of extinct.
- Explain that scientists still debate what caused dinosaurs to become extinct.

Develop Key Vocabulary

extinct Tell students that synonyms for this word include “vanished,” “departed,” and “extinguished.”

Teach Science Concepts

Ask students to tell why they think there are no more dinosaurs. Then, explain that when something becomes extinct, no more of its kind can ever be alive again because there is no way for the animal or plant to reproduce. Explain to students that when scientists do not know things for certain, they form hypotheses, or theories, of what they believe to be true.

What happened to the dinosaurs? Dinosaurs, many other animals, and some plants probably became extinct due to a catastrophic event. Many Christians suspect this event was the Genesis Flood.



Think About It

Why is no one sure what caused dinosaurs to become extinct? When dinosaurs became extinct, either no records were made or the records of them have been lost.



Faith Connection

Find out more about what happened during and after the Flood in *Patriarchs and Prophets*, pp. 107–114.



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?

The Genesis Flood may explain why dinosaurs are extinct.

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The End of Dinosaurs Explain

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.



Assessment Options

Informal Assessment Use the questions and features provided at point-of-use in the teacher wrap.

Formal Assessment Consider assigning the lesson review in the *Student Edition* or the lesson support page found as an *Online Teacher Resource*. The chapter test in the *Teacher Edition* may be used for formal assessment.

Performance Assessment Ask students to perform the task described below. Use the rubric on the next page to assess students.

Task: Have students make a diorama of a dinosaur in its habitat. They should get ideas from reference sources and use a shoebox and other art materials and found objects. Ask them to include what the animal needs to live and to write a summary that tells about the dinosaur.

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.

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Rubric: Use the following rubric to evaluate student performance.

3—Diorama accurately shows dinosaur in its habitat and includes what it needs to live. Written summary is complete and accurately describes dinosaur.

2—Diorama adequately shows dinosaur in its habitat and includes what it needs to live. Written summary is complete and somewhat accurately describes dinosaur.

1—Diorama somewhat clearly shows dinosaur in its habitat and includes most of what it needs to live. Written summary is somewhat complete and somewhat describes dinosaur.

0—Diorama does not clearly show dinosaur or include what it needs to live. Written summary is incomplete or incorrect.

Extend

Make a Connection

Suggest students find information about dinosaurs not mentioned in the lesson. Tell them to gather information about where each dinosaur lived, how each one moved, what each one ate, and each one's unusual features. Students may want to read their facts to a partner and have the partner guess which dinosaur is being described.

Assess/Reflect

Lesson Review

Read the essential question and lesson summary with students. Ask students if they have any questions about the summary. Then, ask students what additional details they would add to it.

Assign the lesson review. Evaluate students' responses, and review concepts as needed. Sample responses are shown below.

1. Graphic organizers should include: center oval: What We Can Learn from Fossils; other ovals: what the place was like where plants or animals lived; how animals moved; what animals ate; size of animals; why animals died out
2. An extinct animal is gone forever because it has died out.
3. B
4. Sample answer: Scientists can measure certain aspects of fossils. Other information about dinosaurs, such as dinosaur behaviors, must be inferred.
5. Many Christians believe that the Flood produced many dinosaur fossils, and we can see from fossils that amazing creatures lived in the past.

Family Link Remind students to be careful not to block access in public places. Always travel with a responsible adult. Photos, crayon rubbings, and clay molds are ways to take the experience home.

Extend

Set Goals

As students study this page, have them summarize these science careers.

Paleontologist Teach Science Concepts

Tell students that paleontologists must be very patient. They must work carefully to remove the dirt and rock surrounding fossils. If a paleontologist is not careful, the fossil could be damaged.

Have students model the work of a paleontologist by excavating chocolate chips (fossils) from granola bars. Give pairs toothpicks, paint brushes, and plastic knives. Instruct the students that they are to excavate whole chocolate chips from their cookies using the tools (no nibbling allowed). Have students relate this activity to the job a paleontologist does.

Geologist Teach Science Concepts

Geodes are round hollow rocks that are lined with crystals. The crystals inside geodes form as mineral-filled groundwater seeps in and minerals precipitate out of the water. Students can make their own model geodes. Pour 2–3 cups of warm water into a large glass. Gradually stir Epsom salts into the water until no more salt will dissolve. Add food coloring. Use one clean, dry eggshell half for each student. Pour the solution into the halved shells. Set the shells in a cool, dry place and wait for the water to evaporate. The crystals form as the water evaporates and the salt is left behind on the eggshells.



Concept Check

1. Sample answer: They have to dig fossils out of the rocks to study them.
2. Sample answers: They both work with rocks. Paleontologists study the fossils found in rocks. Geologists study how rocks affect life on Earth.

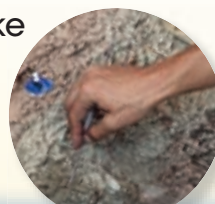
Extend

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.



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?



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.

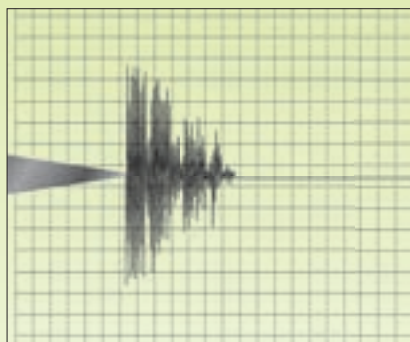
Geologists learn about Earth to help people. They work to predict events such as landslides and volcanic eruptions. This can help keep people safe.

Science and Society

In most fossils, organic matter has been replaced by minerals. If organic matter still exists in a fossil, scientists can use carbon dating techniques to determine the age of the fossil. To do this, they compare the amount of naturally occurring carbon isotopes present in the organic matter. The ratio of carbon-12 to carbon-14 in living things is nearly constant. When a living thing dies, the amount of carbon-12 stays the same, but the amount of carbon-14 begins to decay. By comparing the ratio of carbon-12 to carbon-14, scientists can determine how long ago the organism died. Carbon dating can only be used to date fossils of plants or animals that got carbon dioxide from the air. The fundamental problem is that there is no accurate way to determine how much carbon-14 was actually present upon death. Without that information, it is virtually impossible to pinpoint how long ago death occurred.

Science and Technology

Extend



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?

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Science and Society

Approximately 90% of all earthquakes occur along the Ring of Fire. The Ring of Fire is a horseshoe-shaped string of volcanoes that extends from the southern tip of South America, along the western coast of North America, across the Bering Strait, through Japan, and into New Zealand. Several tectonic plates meet along the Ring of Fire. Tectonic plates move, crashing into or pulling apart from one another, or sliding sideways next to each other. If the plates move abruptly, this causes an earthquake. The largest recorded earthquake occurred in Chile on May 22, 1960. It registered a magnitude of 9.5.

Set Goals

As students study this page, have them discuss how these science technologies improve our lives.

Seismograph

Teach Science Concepts

The seismograph provides information about the strength of earthquakes and how the tremors travel from the epicenter. This information has helped the population be more prepared to cope with earthquakes. The research has also impacted the construction industry in areas of high earthquake activity.

Weather Balloon

Teach Science Concepts

In 1901, the first uncrewed rubber balloon carrying weather instruments was released. The balloon was designed to continue to expand as the air became thinner at higher altitudes. A radiosonde is an instrument carried into the atmosphere by balloon or other means. It transmits measurements by radio. Radiosondes collect wind, temperature, air pressure, and humidity data. They remain in use today and are parachuted to the ground when the balloon bursts. Weather balloons provide valuable information about global meteorology and greatly improve the field of weather forecasting.

Understand Visuals

Have students look at the photo of the seismograph printout. Ask them to identify when the earthquake was strongest and when it was weakest. Have them explain how they gathered that information from the photograph.



Concept Check

1. Sample answer: They do not want the seismograph to be disturbed by forces other than earthquakes.
2. Sample answer: The balloons are all recording data about what is happening at the same time so scientists can share it.