

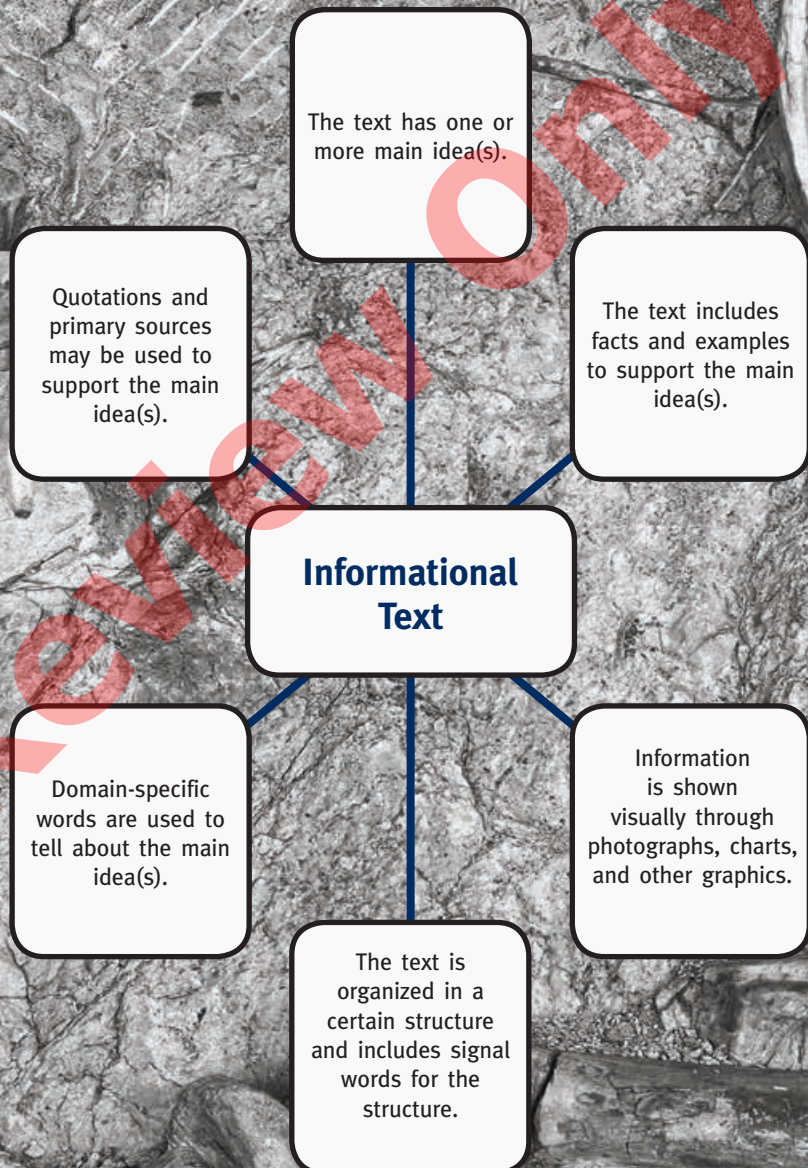
Finding Fossils

by Cynthia Clampitt

How do fossils help us
understand the past?

Informational Text

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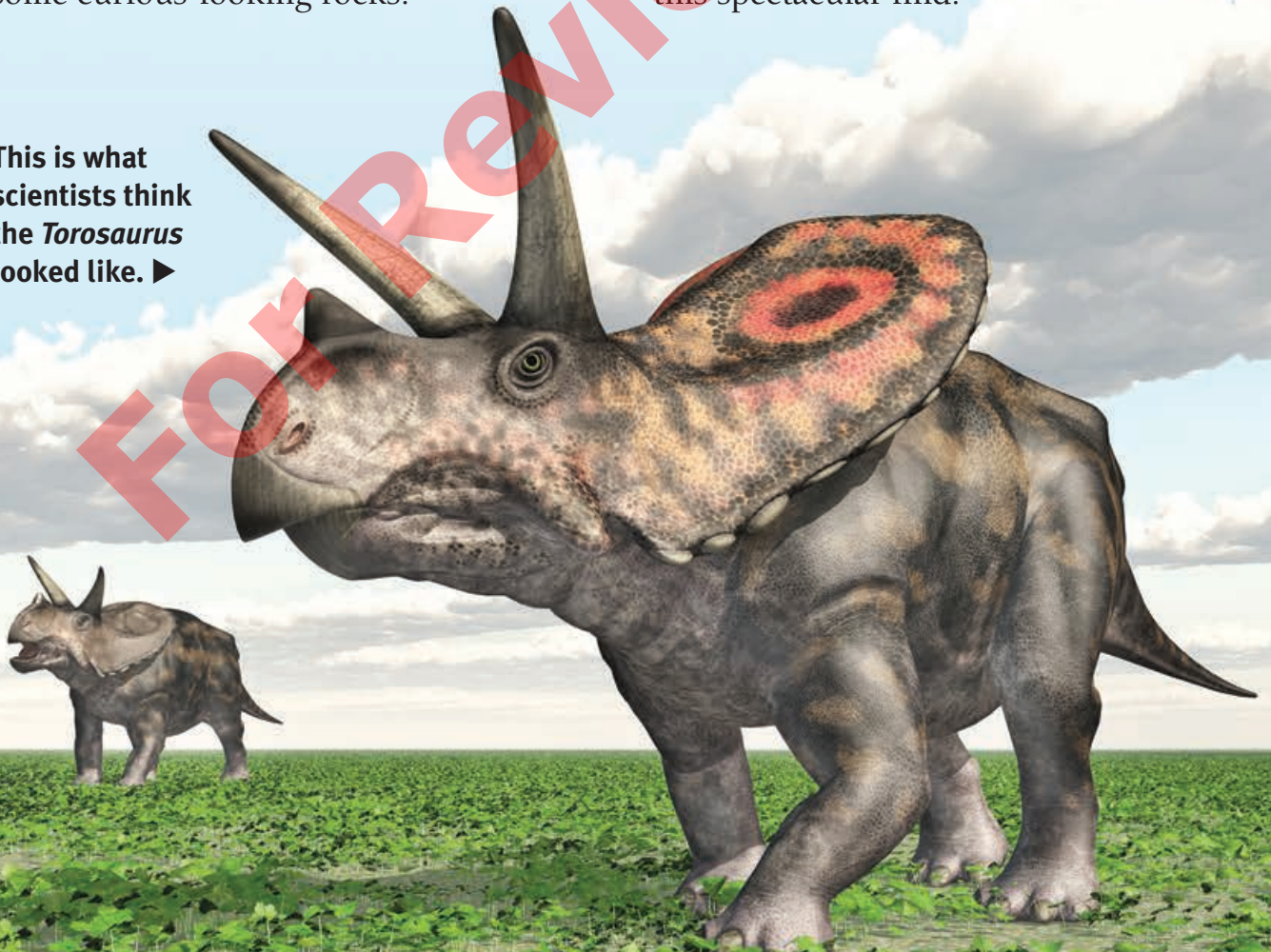
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Discovering the Past

In the summer of 2017, construction workers in Thornton, Colorado, scooped, shoveled, and ripped apart the ground at their construction site. They expected a typical day of digging and moving dirt. What they did not foresee was that they were about to make an amazing scientific discovery. As they excavated the job site, a few of the workers stumbled upon some curious-looking rocks.

The crew quickly called the Denver Museum of Nature and Science to report what they had found. Scientists from the museum came to the site to examine the rocks. Buried deep in the ground was a mysterious **fossil**. As the scientists looked more closely, they realized it was the fossil of a rare dinosaur—a *Torosaurus*. The scientists hoped to learn more about this spectacular find.

This is what scientists think the *Torosaurus* looked like. ►



People who study fossils are called paleontologists. These scientists study the **preserved** remains of ancient plants and animals to learn about what life on Earth was like long ago.

They help identify plants and animals, and name each newly discovered **species**. Every fossil tells a story of how the world once looked and how living things once appeared. This book will describe how fossils form, how they are discovered, and what they reveal about our ever-changing planet.

▼ Paleontologists dig up fossils, then study them more closely.



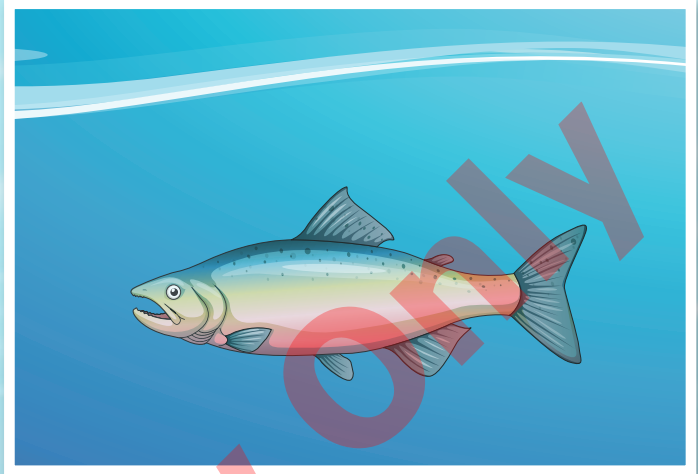
▲ plant fossil



Fossilization

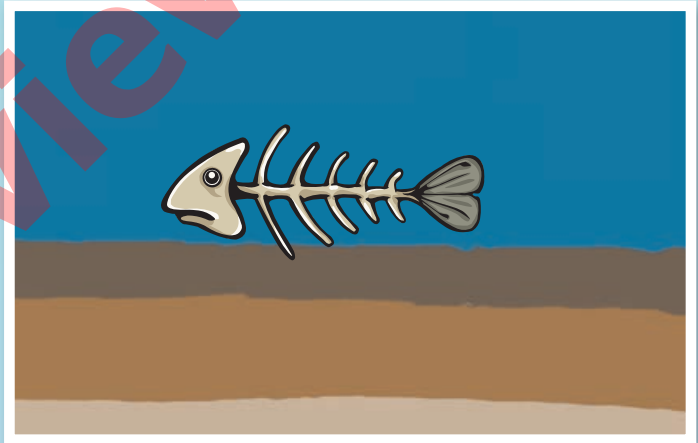
Fossilization of a Fish

Fossils are discovered often, but becoming a fossil is actually rare. Once a plant or animal dies, it usually **decays**. But under the right conditions, the dead plant or animal can be preserved through a process called fossilization. Here is one way a fish can become a fossil.



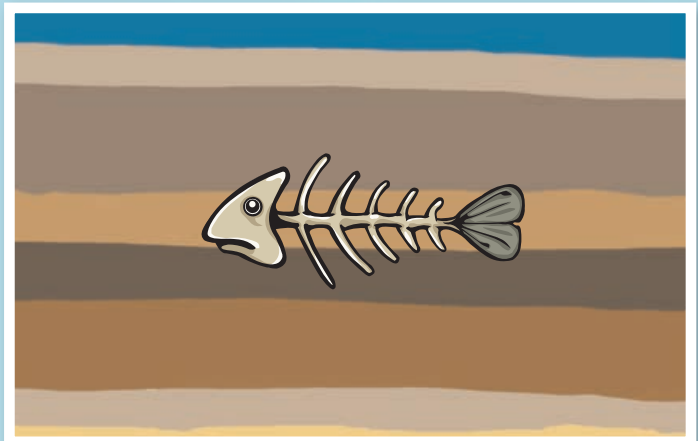
A Fish Decays

After a fish dies, it will eventually sink to the bottom of the seafloor. The soft tissue of the fish, such as its skin and muscles, will start to decay or be eaten by other **organisms**. In time, only the fish's **skeleton** remains.



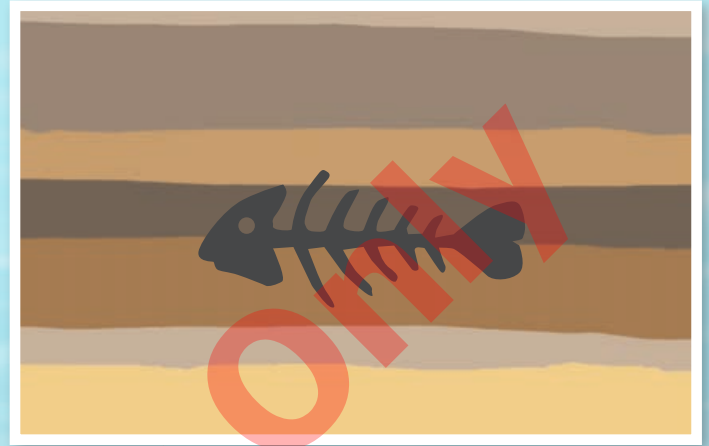
Sediment Thickens

The **skeleton** gets covered by **sediment**, such as mud, clay, soil, or sand. The sediment around the skeleton hardens into rock as more layers of sediment pile on top of the skeleton. Over time, many layers of hard rock will form, burying the skeleton.



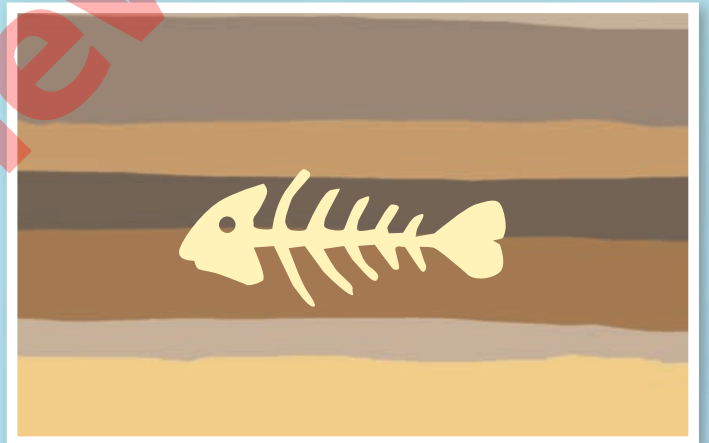
Skeleton Dissolves

The skeleton is now buried deep underground. The rock has formed around the shape of the skeleton. Water seeps in through the layers of rock and dissolves the bone.



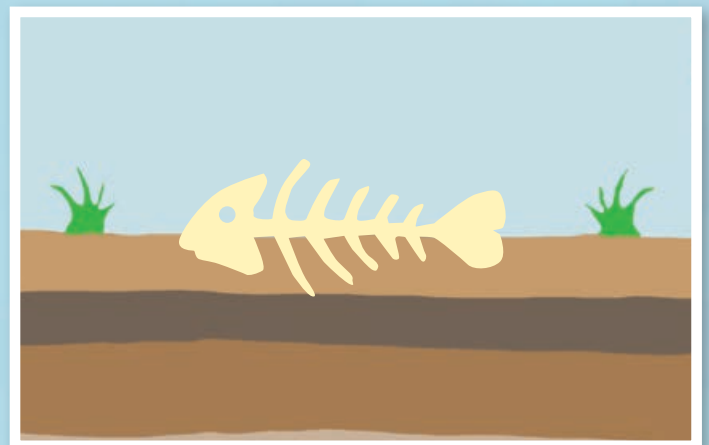
Minerals Fill Shape

The dissolved skeleton leaves an empty space in the rock. Minerals (substances found naturally in water and rocks) fill in the empty space, forming the shape of the skeleton.



A Fossil Appears

Over many centuries, the rock surrounding the fossil rises toward Earth's surface. Through the natural process of **erosion**, rain and wind will wear away the layers of rock, revealing the ancient fossil.



Different Types of Fossils

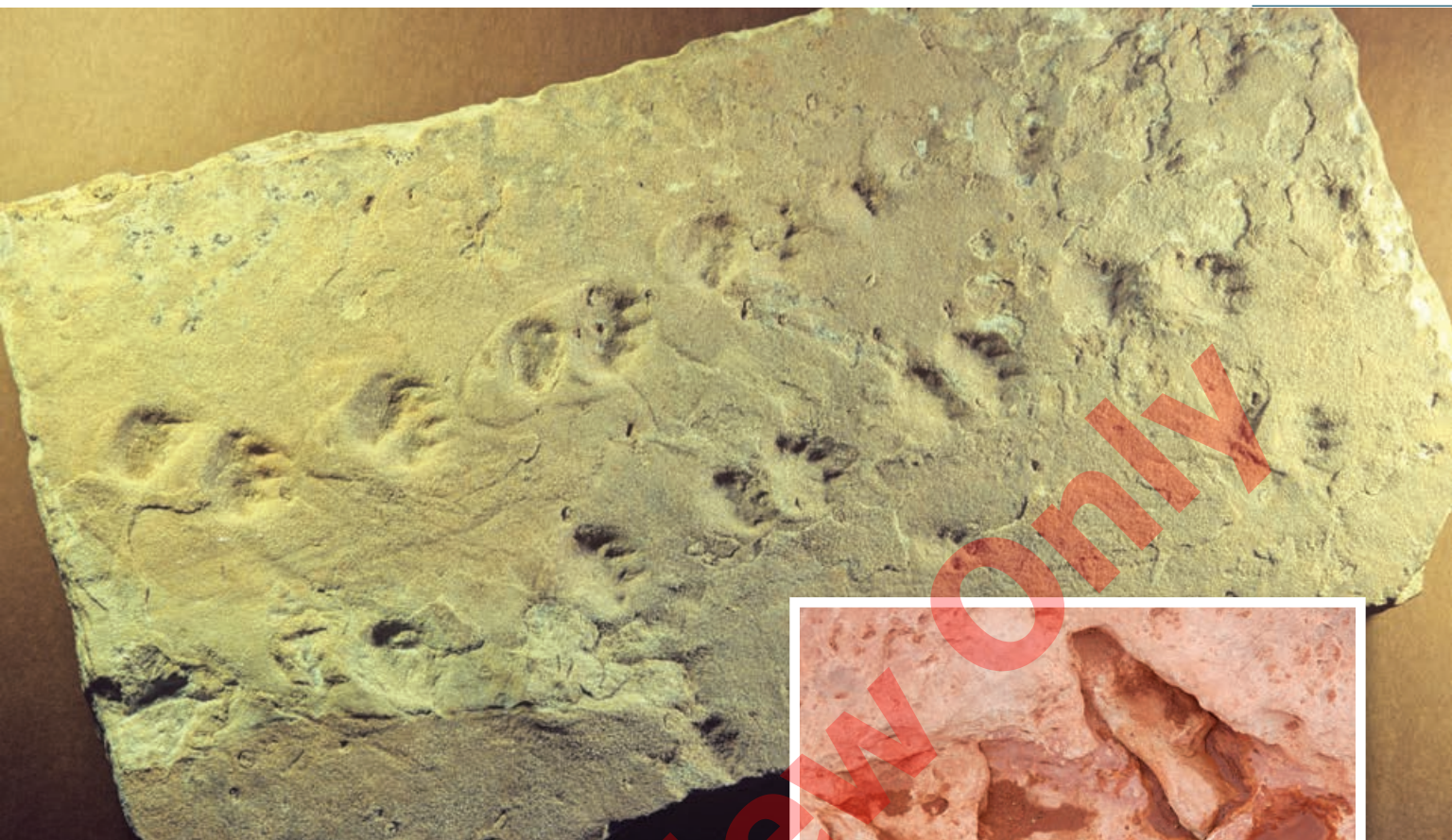
Mold and Cast

Mold and cast fossils preserve a three-dimensional (3D) shape of an organism. A mold forms when soft sediment hardens around a dead organism. For example, the top side of a prehistoric seashell gets stuck in mud. The mud sticks to all the

lines, grooves, and details of the shell. The shell either gets washed away or falls apart over time, leaving an imprint, or outline, in the mud. The mud hardens into rock, preserving the shell's impression. A cast forms when a mold, such as the prehistoric seashell mold, fills with sediment. The sediment hardens and takes the shape of the mold, forming a cast.

▼ Below is a cast fossil and mold fossil of an ammonite, a marine animal that no longer exists.





▲ amphibian tracks

Trace Fossils

Trace fossils show evidence of human or animal activity. Animal prints or tracks, teeth marks, and nests are examples of trace fossils. Trace fossils can show how an animal moved or lived. A trace fossil forms when living things press against wet sediment and the sediment hardens into rock, preserving the marks. For example, a saber-toothed cat hunts its prey by a lake in Argentina. As the cat walks, it sinks its paws into the wet sediment and leaves a trail. If the paw prints remain undisturbed,



▲ a dinosaur footprint

the sediment will harden to stone. Today, the impressions of the saber-toothed cat's prints are still visible.

However, trace fossils are rare because most markings in sediment wash away within days and do not last long enough to become fossils. They often get destroyed by wind or erased by water. It's also challenging for scientists to identify which organism a trace fossil belongs to.

Whole-Body Fossil

One of the most exciting types of fossils is a whole-body fossil. A whole-body fossil is a whole animal or plant that has been preserved, including the soft tissue, such as skin and fur. This type of fossil is rare because it takes certain conditions for it to happen. A whole-body fossil can occur in extremely cold and icy areas like Siberia, a region in Russia.

An animal that dies in an environment like this will quickly get covered by lots of snow and ice. The snow will freeze into a block of ice, preserving the animal. A frozen young mammoth was found in Russia in 2010. Scientists examined how the ice had preserved her skin, trunk, and reddish fur.



▲ Scientists named the baby mammoth Yuka.



▲ This insect is preserved in amber.

Amber Fossils

Many trees and plants produce a sticky liquid called resin. As resin trickles down a tree, it begins to harden when exposed to the air. Sometimes, before resin hardens, seeds, leaves, or insects can get stuck inside the sticky resin. As the resin hardens, remains are trapped inside. Over many centuries, the resin fossilizes, and it turns into amber—a hard, clear, shiny, golden-brown substance. Amber fossils often contain a perfectly preserved example of a seed, leaf, or insect that lived in ancient times. Scientists study amber fossils to learn about these living things from the past.

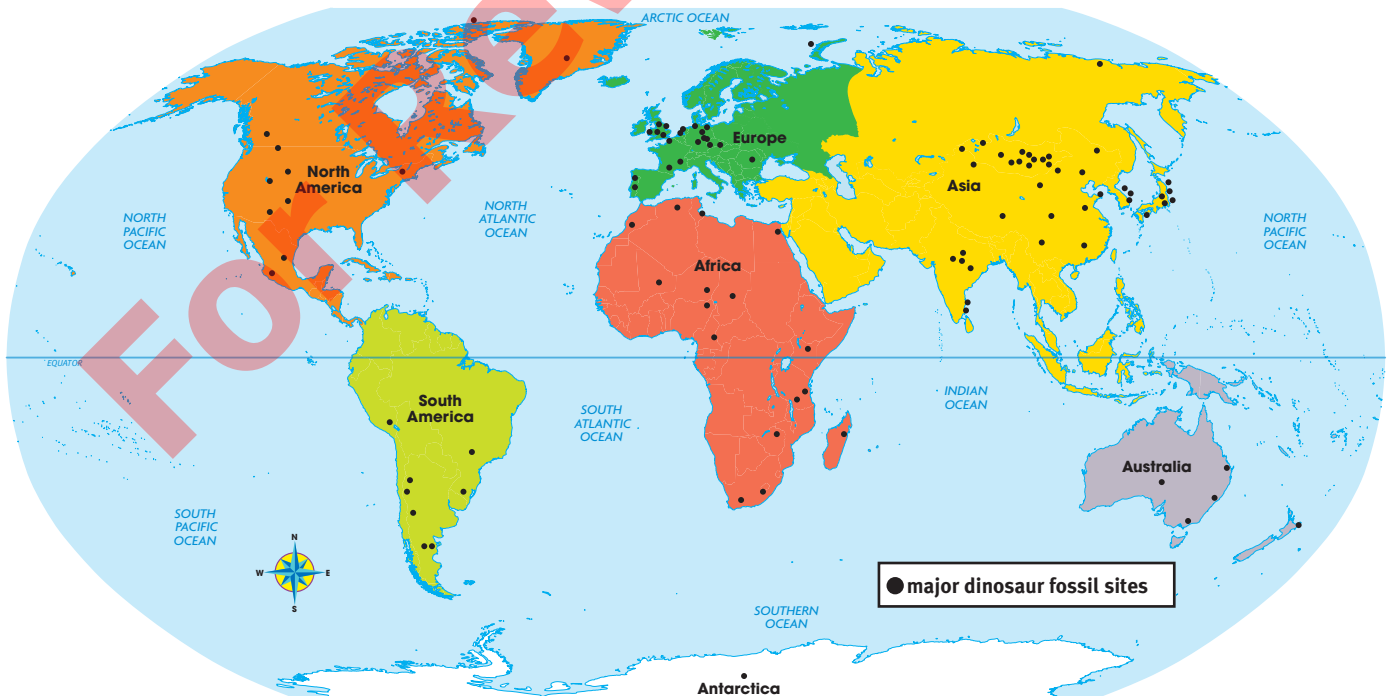


Discovering Fossils

Fossils are discovered all around the world, typically in layers of **sedimentary rock**. Paleontologists focus on areas where other fossils have been found, or they research specific places. Sometimes they pick a place at random or get permission to dig in an area. First, they look for any fossil fragments or pieces on the ground. If fossil fragments are found, this is a clue that larger fossils might be nearby.



▲ fossil jaw fragments



▲ Dinosaur fossils have been found on every continent, from the United States in North America to the mountains of Asia.