READING MATERIAL

Read About Earth's Landscapes

DEFINITION OF EARTH'S LANDSCAPE

A*landscape*describes all the visible features of the Earth's surface now or in the past. We can learn about Earth's landscapes from the past by studyingrock layersand the fossilsfound in them.

To better understand Earth's surface features and landscapes ….

LET'S BREAK IT DOWN!

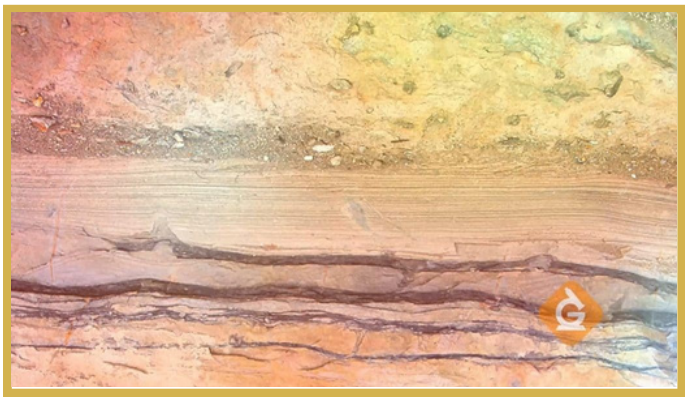
The oldest rock layers are at the bottom and the newest layers are at the top.

We can tell about the Earth's history by looking at the different layers. The upper layers, those that are closest to the surface of the Earth, are the newest layers to be laid down.

Layers below are older. Since sedimentary rocks form on top of each other, it is very easy to see Earth's geologic history in areas where this type of rock is found.

The Grand Canyon is an excellent example. For millions of years, the Earth's surface was carved by the Colorado River. Many layers of sedimentary rock make up the mile-high walls of the canyon. The walls display a history of the Earth's surface that dates back about 2 billion years.

The location of fossils in rock layers provides evidence of Earth's past landscapes.



It is hard to guess the age of rock. Scientists have to act like detectives, piecing together a mystery to determine how long ago rocks formed.

Fossils found in a particular rock layer help scientists determine the age of the rock. Scientistsusea technique called radiocarbon dating to find out the age of the fossils. Once they know the age of the fossil in the rock,they also know that rock itself is about the same age!

Sharktooth Hill in California tells a story of Earth's past.

Sharktooth Hill in California is about 100 miles away from the ocean. Millions of years ago, Sharktooth Hill was under the ocean. Here, paleontologists find lots of fossils of marine life, surrounded by silt. The remains of ancient sharks, whales, dolphins, and turtles have been found buried 30 feet underground.

Scientists believe that this area was once an ocean with a river flowing into it which deposited sediment (sand and clay) at the bottom. When animals died here they were buried in the sediment. One day, the river stopped flowing and lots of animals collected at the bottom. When the river started flowing again, it buried all the bones together.

Now, millions of years later, this area is no longer an ocean and the bones are preserved as a layer of fossils known as a*bone bed.*

EXAMPLES OF EARTH'S ANCIENT LANDSCAPES

Giant seals from over 15 million years ago are found in rock layers at Sharktooth Hill. By knowing the age of the fossils, scientistscan also know the age of the rock in which it is found.

***Radiocarbon dating*is used to find out how old the fossils are.**Scientists compare the carbon in the fossils to carbon today to determine how long ago the fossil formed.

Millions of year ago, the west coast of the United States was a maze of islands and lagoons. Over time the islands collided to create mountains and valleys that make up the state of California.

EARTH'S LANDSCAPES VOCABULARY

Fossil	A fossil is evidence of past life on Earth.
Sharktooth Hill	A place in California located 100 miles away from the Pacific Ocean. Millions of years ago this region was under the ocean. Today it is on dry land and we find fossils of marine life like whales, sharks, dolphins and turtles in a thin layer 30 feet below the surface.
Paleontology	The branch of science that studies fossils of animals and plants.
Silt	Fine sand, clay, or other material carried by moving water and deposited at the bottom of a body of water like the ocean.
Sedimentary Rock	Sedimentary rocks are made when sand and mud gets laid down in layers. Over time, these layers are squashed under more and more layers. Eventually, the layers turn into rock.
Bone bed	A layer in the earth containing large quantities of fossilized animal remains.

EARTH'S LANDSCAPES DISCUSSION QUESTIONS

What kinds of evidence supports the idea that the landscape at Sharktooth Hill was once under the ocean?

Fossils from whales, sharks, dolphins, and turtles are found there along with silt, which is sediment found at the bottom of the ocean.

Why is it possible to find ancient fossils right at the Earth's surface?

Although the layer of rock that contains the fossils found at Sharktooth Hill is very old, it is exposed at the Earth's surface in some areas of the dig site so fossils can be found right on the ground. Older rocks above this fossil layer eroded over time due to water and/or wind.

Is there any evidence that a volcano caused all the animals to die here?

No. Scientist have not found any volcanic ash in the rock layer. They also ruled out that all the animals were eaten by sharks because very few shark bites have been found on other animals' bones. There is no evidence to support these theories.

What is the current understanding of how the fossil bone bed at Shark Tooth Hill formed?

The silt the bones are buried in is thought to have come from a river depositing fine sand and clay on the bottom of the ocean. Animals who died naturally in that area would have been buried and fossilized. Scientists think that the river may have stopped flowing for some time (due to a change in the climate), which meant sediment was not being deposited and animal skeletons collected on the sea floor. When the climate shifted and the river started flowing again, sediment then buried all the collected skeletons, forming the bone bed.

How do the rock layers above and below the bone bed compare in age?

The rock layers above the bone bed are younger than the bone bed. The rock layers below the bone bed are older than the bone bed.

Where would you look for evidence of what it was like before the bone bed formed?

To know about the environment before the time the bone bed formed, you would need to dig deeper than the bone bed. Layers below it would be older.
