Earth's Features

The Earth has many geological features that are constantly changing. These features were formed through processes that change the Earth's surface over time.

Physical features of the Earth are called *landforms.* Earth's landforms are created in different ways by different processes that help change the Earth over time. These processes include erosion, deposition, and tectonic movement. Examples of landforms formed by these processes include mountains, valleys, beaches, caves, sinkholes, lakes, rivers, and watersheds.

Mountains

Mountains were formed by the *collision of the continental plates*. Tectonic plates move very slowly, at a rate of 1 to 15 centimeters per year. Over hundreds of millions of years, plates sometimes collide, or crash into one another. When continents meet head-on in a collision, the crust tends to buckle and be pushed upward or sideways. This is how some mountain ranges are formed.

The mountain range called the Alps formed from the collision of two tectonic plates.

Valleys

Valleys are long, low areas between taller formations of rock and soil. Like mountains, valleys can also be formed through the collision of tectonic plates. As the continents become "crumpled" during collision, part grows taller into mountains, but part grows lower and deeper into valleys between the mountains.

Valleys can also be formed by erosion of rock and soil by water or glaciers. A glacier is a large, slow-moving mass of ice and snow that moves across the Earth's surface, pushing sand and soil, cutting the Earth, and moving rocks and boulders.

This valley could have been formed as a result of erosion by a glacier.

Beaches

The processes of erosion and deposition are opposite but related. If rock and soil is eroded, or carried away, from one place, it will be deposited, or laid down in another place.

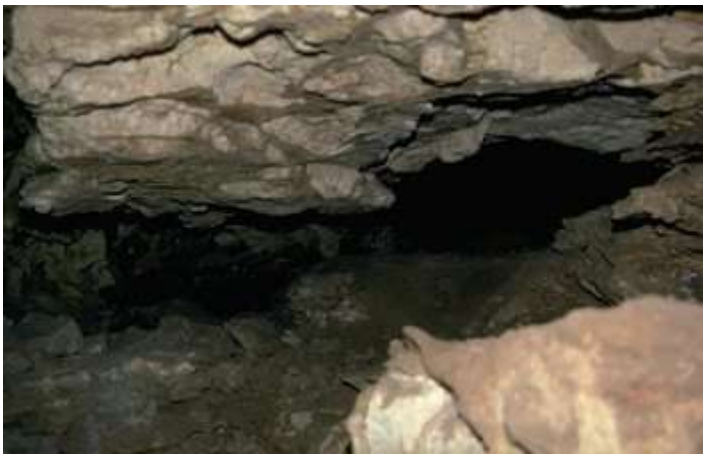
Sandy beaches form when water waves *deposit* sand and other materials on the shore. The video below talks more about the processes that form sand and deposit sand on beaches. To start the video, click the play button.

Clip provided by Education Clip Library with permission from ITN Source

The shorelines of beaches often change shape. They can grow larger in one area and smaller in another. Strong storms can cause more rapid change in the shoreline.

Caves

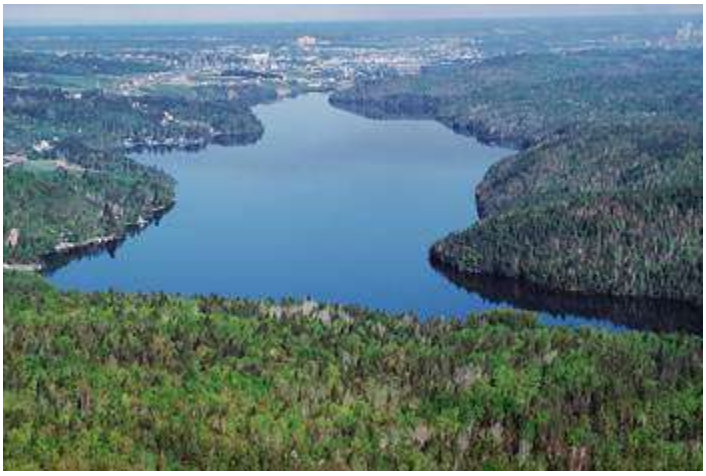
Caves are natural tunnels or open spaces in underground rock. Caves form when water erodes, or wears away, sections of rock.



Water can dissolve or wear away rock to form caves.

Lakes

Lakes are large bodies of water. Usually, lakes contain freshwater. Lakes can be formed through several ways, but many were created by glaciers eroding the land into hollows and then leaving pools of water as they melted.



Many lakes were carved out by glaciers.

Rivers

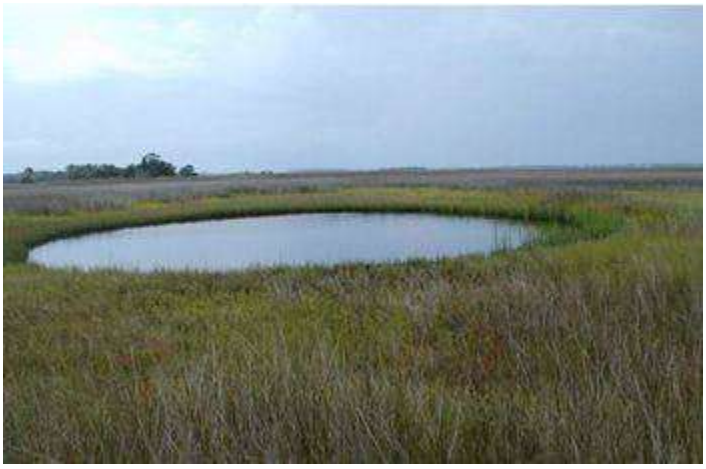
Rivers are formed when gravity causes water from a spring or lake to travel from a higher elevation to a lower elevation. The flowing water erodes rock and soil, and the river bed can grow wider or deeper over time.

River beds can change shape over time as soil and rock are eroded and deposited.

A river often gets its water from a **watershed**, or land area that catches rain and snow and drains into a body of water located at the lowest point.

Sinkholes

Sinkholes form when groundwater removes rock underground, and the surface dirt gradually or suddenly sinks down into the hole where the rock used to be. Sometimes, the hole fills with water.



After this sinkhole formed, it filled with water.

Image is courtesy of USGS.

Peninsulas

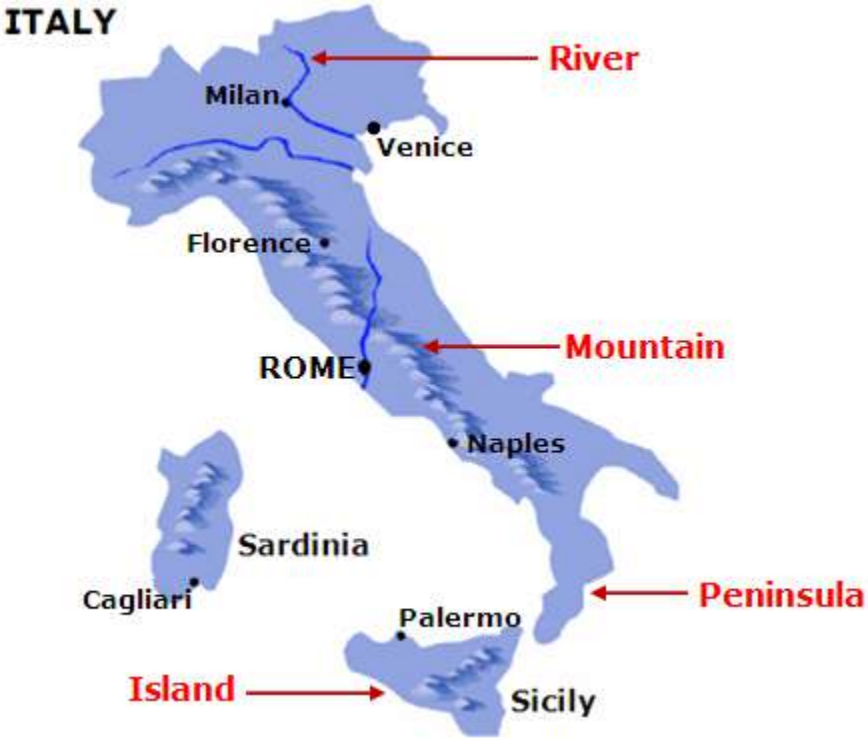
Peninsulas are pieces of land that jut out into a body of water. Peninsulas are connected to a larger piece of land, but they are surrounded by water.

This area of land off the coast of Great Britain is an example of a peninsula.

Using Models to Identify Landforms

In order to understand or describe Earth's various features, models may help. The models provide information about the shape, height, length, depth, and other aspects of the Earth's features.

A map is a type of model. Maps can be used to identify and locate landforms. For instance, a mountain, island, river, and peninsula are shown on the map below.

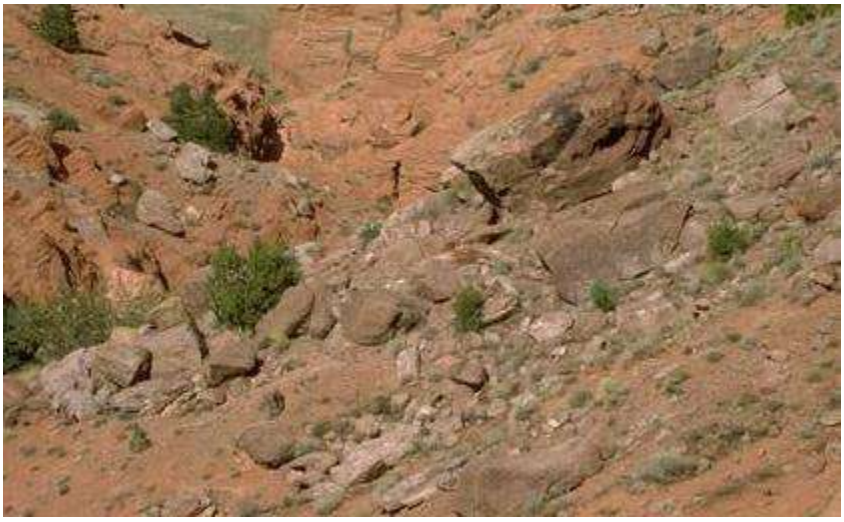


Soil

Soil is the top layer that covers the Earth. Soil is made of weathered rock, living organisms, and decaying plant and animal material. Many plants need soil to grow.

Soil is Made up Partly of Weathered Rocks

Weathering breaks rocks, like the ones shown below, into smaller pieces. Over thousands of years, the rock pieces get smaller and smaller until they become particles of soil.



Weathering is caused by wind, water, and ice.

- **Wind** can blow small pieces of rock and sand against bigger rocks. Over time, many small pieces of rock break off and become soil.
- **Water** in the oceans and in rivers and streams can also break rocks into smaller pieces over time. Moving water weathers off the rough edges of big rocks and makes them smooth. The small pieces of rock are carried by the water and deposited as soil.
- **Ice** weathers rock too. Water can soak into rocks. If the water freezes into ice, it expands in the rock. This makes the rock crack. Because of the cracks, the rock breaks into smaller and smaller pieces over time until it becomes soil. The picture below shows rocks that have begun to crack.

Soil Contains Decaying Plant and Animal Material

Soil also comes from the decayed matter of plants and animals after they have died. Leaves that fall from trees and animal wastes also break down into soil. Decaying parts of plants and animals are called *organic material*. Organic material in the soil is important for helping new plants grow.

In the picture of the tree stump, the wood is decaying into soil. Parts of the wood are still in large chunks. Over time they break into smaller and smaller pieces.

Soil Contains Living Organisms

Soil contains living organisms, such as earthworms, insects, fungi, and bacteria. Many of these organisms are too small to see with the naked eye. These tiny organisms are

called *microorganisms*. The mushroom shown below is a kind of fungi that is large enough to see without a microscope.