



# Science and Health

## EFFECT OF EROSION ON THE CONDITION OF SOIL AND LAND SHAPE









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In the previous module, you have learned that water, wind, people and animals contribute to soil erosion.

In this module, you will find out how soil erosion affects the shape of the land.



Describe how erosion changes the shape of the land.

**4** Provide reasons how erosion affects the condition of the soil.



Write TRUE on the space before the number if the sentence expresses a correct idea. Write FALSE if the sentence expresses a wrong idea.

- 1. Waves produce sea caves and sea arches.
- \_\_\_\_\_\_ 2. Running water can produce different land formations.
- \_\_\_\_\_ 3. Soil erosion can cause irregular shaped slopes of a mountain
- \_\_\_\_\_ 4. Poor soil can support plant growth.
- 5. Soil erosion makes the topsoil thinner and less fertile.



#### How Erosion Shapes the Land

Mountains, plateaus, valleys and plains are some of the different landforms on Earth. The breaking down of rocks and their erosion caused the formation of some of these landforms.



In what way did the flow of water change the shape of the mountain?

Mountains change as they grow old. Erosion by wind and water carries away broken rocks and soil until the mountains become plains.

Plateaus also change due to erosion. Horizontal terraces develop along their slopes. The top of some plateaus become rounded. Valleys may also form when rivers cut through the plateaus. Streams can carve valleys.



The valley was formed when a river cut through a plateau. Erosion is one of the processes that formed this valley.





Gradually, the cave Is eroded and a small Islet formed

Then the land breaks up until the Islet disappears

**Wind** can change the desert's surface. It can make the surface look like the waves of the sea. Loose sand particles keep on rolling until they form wave-shaped hills. These hills of sand are known as *sand dunes*. They are usually found in Africa and the Middle East.



Crescentric dunes



Stardunes

Landslides usually occur when rainwater flows rapidly down a bare mountain slope. The steepness of a slope is affected with the continuous flow of rainwater.



The irregularly shaped slopes of a mountain

During the rain, the water looks muddy because it carries particles of clay, sand, and minerals. After a while, it clears forming several layers of rock materials. This represents the soil profile. Do you know what a soil profile is? A soil profile refers to layers of soil; horizon A, B and C. Horizon A refers to the upper layer of soil known as topsoil. It is where humus is. Horizon B is found below horizon A where there is much less humus. Horizon C consists of big rocks. Each layer differs in color, composition and texture.

Minerals come from broken rocks and humus. Humus, a dark sticky substance, is formed when plants die and decay. It holds soil particles together and absorbs water.

The topsoil which contains humus thins out and therefore is less fertile because the minerals have been washed away by rainwater and floodwater.

Below are illustrations of two soil profiles. Soil profile A shows



Soil Profile

the condition of the soil before erosion. Soil profile B shows soil condition after erosion.



Soil Profile A

Soil Profile B



Put  $\sqrt{}$  if the statement is true and  $\underline{x}$  if it is not.

### Erosion can cause

I. mountain become plains
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- \_\_\_\_\_ 2. plateaus become rounded
- \_\_\_\_\_ 3. cave eroded
- \_\_\_\_\_ 4. irregularly shaped slopes of a mountain
  - \_\_\_\_\_ 5. the topsoil fertile



1. Compare erosion in flat lands and in steeper lands.





Write the letter of the correct Soil Profile. Refer to the illustration below.



Soil Profile A

Soil Profile B

1. Which soil profile is darker and thicker? paler and thinner?



In the cold region of the movement of glaciers also causes erosion, a glacier is a giant ice mass. Due to gravity, a glacier moves downslope. The ice crystals deep within the glacier change their shapes and regroup. The ice crystals melt and refreeze along the base of the glacier. The small changes in the individual crystals cause the glacier to move. The melting and freezing of the ice crystals cause the glacier to move. The melting and refreezing of the ice crystals help it slide downslope.

As the glacier moves downslope some of the crystals of the glacier's bottom layer melt. The resetting water flows down into cracks in the rock underneath. While in the cracks, the water freezes, then expands and breaks away pieces of rock. These pieces of rock become part of the glacier.

As a glacier melts, it leaves behind humps of hand bedrock, and rounded hills and narrow ridges of debris. Hollow in the loose rocks trap water from the melting glacier, forming lakes.

As a glacier passes over an area, it changes the surface of that area. A variety of land forms are formed by means of erosion. Scientists believe that during the ice age, the glaciers greatly changed the surface of large parts of Europe, Asia and North America.

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## Let's Try This

- 1. TRUE
- 2. TRUE
- 3. TRUE
- 4. FALSE
- 5. TRUE

## Let's Do This

- 1.√
- 2. √
- 3. √
- 4. √
- 5. x

## Let's Do More

Steeper lands make water flow faster and eroded soil easily compared to flat lands.

## Let's Test Ourselves

1. Soil Profile A Soil Profile B