

Weathering and erosion

Weathering is the breaking-apart of rocks in a particular place. You can see the effects of weathering all around you, where roads and pavements become cracked and damaged due to their exposure to the weather and other types of damage. **Erosion** is a much wider term. It describes **both** the breaking apart of rocks **and also their removal**, for instance by a moving ice sheet. When you look at a valley in the **landscape**, you see the effects of erosion. A gap has been created, perhaps by the action of running water and the local weather. However, the broken-down rocks have also been removed, leaving the valley shape.

(1) WEATHERING

Look at the photograph opposite. It shows a footpath in south London. When the tarmac was originally laid, the footpath would have appeared flat and had no cracks. Now it is disintegrating where it sits!

Before you read any further, can you say what forces are causing the destruction?



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The footpath is weathering due to many different factors or causes:

- ❖ Rainwater **freezes** at night in small hair-line cracks and widens them. Water expands by 10% when it freezes to form ice. Over time, cracks get wider and wider
- ❖ Daytime, night-time and seasonal **temperature changes** cause minerals in the tarmac to expand and contract as they are heated and cooled - which can be very damaging
- ❖ Rainwater contains mild **acids** that can dissolve some minerals over long periods of time
- ❖ Tree roots are growing underneath the tarmac and they break it apart. This is **biological weathering**
- ❖ Humans walk on the path every day and their **trampling** damages it



(2) ICE EROSION

Erosion involves the break-down of rock and its removal by a moving force like ice or water. Look at the photograph opposite. The needles of rock are all that remains of a **highland** area that has been attacked by ice.

As it moves downhill, ice not only helps break apart the rock beneath, **it also transports** the broken-down material into **lowland** areas.

In the photograph below, you can see an enormous glacier moving down a slope under gravity. All that is left either side are the very toughest parts of a highland area that have so far survived the ice's attack!



HOW IT WORKS...

As the ice moves over a rock surface, it freezes around loose or weak sections, pulling them away. This is called **plucking**. Once pieces of jagged rock are being carried by the ice, they have a 'sandpaper effect' on other land surfaces, helping to cause further destruction. This is called **abrasion**.

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ACTIVITY Ice is not the only agent of erosion found in the natural world. Water and wind are also important agents of erosion.

- What types of **physical environment** do you associate with (i) water and (ii) strong winds? Where are they found?
- How do you think water and wind help with (i) the **break-down** of rocks and (ii) the **movement** of sands and gravels?
- What kind of **landforms** and **landscapes** do you think result from water and wind erosion?

Tip: if you have access to the internet, try googling 'water erosion' 'wind erosion' 'sea cliffs' and 'sand dunes' to get you started. You can select 'image search' within Google to call up pictures. Also remember to ask your geography teacher for an atlas to help you get started.