



Glacial environments

Lesson 4: What landforms of erosion will disappearing ice reveal?

Key idea:

A range of erosional landforms is revealed in upland areas when ice melts. Ice plays a role in creating these landforms.

Starter activity:

What is the difference between erosion and weathering?

Pupils should understand the difference between weathering (material broken down on site) and erosion (where the broken material is additionally carried away by a moving force). A starter activity could involve the grouping together of examples of weathering (images of blockfields, scree slopes or granite tors) and erosion (images of moving water, ice or abrasional sand storms). Alternatively, the Word document 'Erosion and Weathering' can be studied.

Main activity:

How does ice erosion (and other forms of physical erosion) work?

Continuing from the Starter activity, the word document 'Erosion and Weathering' contains additional details facts about how erosion and weathering work. It also outlines the key processes of ice erosion, and a series of activities are suggested which that are designed to get students thinking about how physical processes work in different environments.

What are the main landforms of glacial erosion?

The PowerPoint presentation 'Glacial landforms' introduces students to a range of landforms created through glacial erosion, illustrated through images from the Himalayas and the Andes. Landforms shown include U-shaped valleys, corries, Arêtes and pyramidal peaks. It may also be possible to cover further examples, such as hanging valleys and truncated spurs, if time allows. The importance of abrasion, plucking, scouring and freeze-thaw in the creation of these landforms should be highlighted – see fact sheet for further details.

The 'Glacier card sort' activity allows students to test their knowledge and understanding of a range of key terms relating to glaciers and erosional landforms. The correct matching for the exercise is as follows:

Ice Age	A period of Earth's history when temperatures are colder and glaciers grow colder
Abrasion	The 'sandpaper' erosion effect that a glacier has on the rock beneath it
Snout	The front end of a glacier
Highland	An upland area where glaciers may be found and erosion landforms like pyramidal peaks may be visible
Pyramidal peak	A sharply pointed mountain found in glaciated highland areas
Arête	A sharp ridge in a glaciated highland area, often leading to a

	pyramidal peak
Meltwater lake	A large body of meltwater that has collected in a hollow or depression close to a glacier
Plucking	An erosion process that involves glaciers tearing chunks of rocks away from the land beneath
Corrie	A deep hollow on the side of a mountain where ice collects, often located below an arête
Lowland	An area closer to sea level which glacial meltwater rivers flow into and where river deposition occurs
U-shaped valley	A wide, deep and steep-sided landform that runs through an area that has been eroded by glaciers

Plenary

Where did the roche moutonnée get its name?

The lesson can end with a PowerPoint presentation ('Roche moutonnée') about this interestingly-named erosional landform found on the floor of glaciated valleys. Ask your students:

- What language is this written in?
- What might it mean when translated?
- What landform does it describe?
- What does it have to do with glaciers?

The photograph shows a roche moutonnée in the Ogwen Valley. Wales was one of the most southerly points in the UK to experience the ice age.

Further research

Teachers can research erosion landforms and processes as preparation for the lesson at: www.uwsp.edu/geo/faculty/ritter/geog101/textbook/glacial_systems/title_page.html

Excellent online images showing erosional landforms (especially corries) revealed by melting ice:

www.swisseduc.ch/glaciers/morteratsch/comparison/bernina-summit-en.html
www.swisseduc.ch/glaciers/earth_icy_planet/glaciers02-en.html?id=10

To see ice moving (and to grasp the 'sandpaper' effect of abrasion), watch: www.youtube.com/watch?v=njTjfJcAsBq