

# Sound Erosion

## Activity Overview

Through involvement in creative sound composition, students will further develop their understanding of the changing landscape and how erosion is reshaping the earth's surface.

## Objectives

- Describe the effects of wind, water, and ice on the landscape (e.g., ice breaking rocks into soil), and identify natural phenomena that cause rapid and significant changes in the landscape (e.g., floods, tornadoes, heavy rainstorms).
- Investigate the factors that cause erosion of the landscape.

## Materials

- Various musical instruments
- Laminated picture cards

## Setup

1. Lay all the musical instruments out.
2. Have all six picture cards in a pile.

## Takedown

Place musical instruments, and picture cards back into bin.

## Vocabulary

**Mining:** Mining is the extraction of valuable minerals or other geological materials from the earth, usually from an ore body, vein or (coal) seam. Materials recovered by mining include base metals, precious metals, iron, uranium, coal, diamonds, limestone, oil shale, rock salt and potash.

**Ice wedging:** As one of the many kinds of mechanical weathering, ice wedging is the most common. Water fills up cracks in rock, and when it freezes, it expands and cracks the rock, similar to driving an axe into wood.

**Glaciers:** Large masses of ice that form by the compaction and recrystallization of snow under freezing conditions; glaciers often move downslope or outward in all directions because of the stress of their own weight; they may be stagnant or retreating under warming conditions.

**Tsunamis:** Tsunamis are ocean waves produced by earthquakes or underwater landslides. The word is Japanese and means "harbor wave," because of the devastating effects these waves have had on low-lying Japanese coastal communities.

**Floods:** the rising of a body of water and its overflowing onto normally dry land; "plains fertilized by annual inundations".

**Grazing:** Any vegetated land that is grazed or that has the potential to be grazed by animals.

**Deforestation:** Deforestation is the clearance of naturally occurring forests by logging and burning.

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## What will I be doing? (Procedure)

*Before you start your presentation check with the teacher or chaperone that the entire group is present and ready to start.*

Remember that **doing** an experiment and **discovering** the answer is more powerful than watching and listening to someone, so try to involve as many children as possible.

**Ask:** "What do we know about erosion?"  
"What is erosion?"

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- Discuss with the students that the earth is constantly changing, forming, and eroding through natural, and human-induced factors.
- Erosion slowly chisels, polishes, and buffs the earth's rock into ever-evolving works of art, and then washes the remains to sea.
- There are two kinds of erosion – natural and human affected.
- Natural erosion would include ice wedging, tsunamis, floods, wind.
- Human-induced erosion would include mining, grazing, and deforestation.

**Form six groups with the students, each group will get a picture card of erosion to represent. Once in groups hand a picture card to each group to re-enact. Then ask one group at a time to choose an instrument from the table.**

**Say:** *"We are going to present a few erosion concepts, and in your group you are going to use the musical instruments and motion to re-enact them."* Explain briefly all the erosion concepts to the students before they have time to practise their re-enactment.

- Mining – When an area is mined the vegetation (or plant cover) is removed which means that soil is more likely to be eroded by wind and water.
- Glaciers – A glacier is a large body of ice that moves very slowly across the earth. As it moves it scrapes the ground, lifting pieces of rock and debris, and carries it along with it before dropping it at another location.
- Tsunamis – A tsunami is a series of large water waves. The displacement or movement of a lot of water in a short period of time means that a lot of sand and sediment can be eroded.
- Floods – Flooding occurs when a lot of precipitation falls over a short period of time and causes water to cover land either directly from the precipitation or from the overflow of rivers or lakes.
- Grazing – Grazing is when animals encouraged to eat the grass or vegetation in a field. One negative aspect of this practice is when animals are allowed to over-graze. This means that they eat too much of the vegetation which leaves the soil bare which leads to increased soil erosion from water and wind.
- Deforestation – this is the removal of trees in an area. This decreases soil cover and protection which leads to greater erosion of soil.

Give the students 1 minute to rehearse what they are going to do for their concepts, then when they present have the students guess what it is. Let them come up with ways of using the instruments but you can refer to the following suggestions if they are stuck.

Ways to use instruments:

- Mining – Two sticks (sound of pickaxe, and swinging motion with their arms)
- Glaciers – Percussion instrument with scraper (slow low motion of glacier moving)
- Tsunamis – Thunder tube (sound of a big wave, and wave motion)
- Floods – Rain sticks (rain sound, water motion)
- Grazing – Mini symbols (symbols, and walking on all four limbs with moo sound)
- Deforestation - Finger castanets (castanets, with chopping motion)

## **Background Information**

Erosion is a natural process which is usually made by rock and soil being loosened from the earth's surface at one location and moved to another. Erosion changes the landscape by wearing down mountains, filling in valleys, and making rivers appear and disappear. It is usually a slow and gradual process that occurs over thousands or millions of years. But erosion can be speeded up by such human activities as farming and mining. Erosion begins with a process called weathering; in this process, environmental factors break rock and soil into smaller pieces, and loosen them from the earth's surface.

When the wind whips up a dust storm that stings our eyes, its ability to move sand is very clear. But the most powerful erosive force on the earth is not wind but water, which causes erosion in its solid form of ice and as a liquid. Water in its liquid form causes erosion in many ways. Streams from tiny creeks to huge rivers carry tons of eroded soil and rocks every year. The size of eroded materials a stream can carry depends on the speed of the stream, and the turbulence or roughness of the water; a fast turbulent stream can carry large rocks, while a slow gently flowing stream carries only particles of sand and clay.

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Not all rock or soil react the same to the forces of erosion; hard rock that contains many cracks may wear away faster than softer rock because the cracks can cause big chunks of the rock to break. Soft rock will lose just tiny bits at a time. Most soils erode more quickly than rocks, since soil is made of smaller particles that are more easily washed or worn away.

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Water seeps into cracks and fractures in rock.



When the water freezes, it expands about 9% in volume, which wedges apart the rock.



With repeated freeze/thaw cycles, rock breaks into pieces.











