

**MINISTRY OF EDUCATION
SECONDARY ENGAGEMENT PROGRAMME
INTEGRATED SCIENCE
GRADE 9**

WEEK 13

LESSON 2

Topic: Terrestrial environment

Sub-topic: Soil conservation

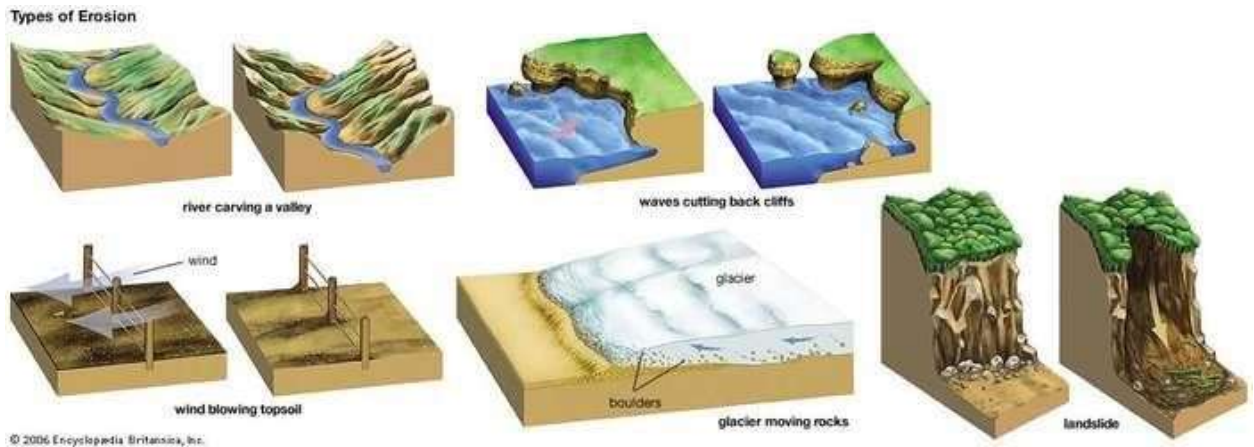
Objective: After readings and observing students will accurately

- Define erosion in one sentence.
- Describe the importance of topsoil in two sentences.
- Explain practices that improve soil conservation in one paragraph.

Content

Erosion

Erosion is the geological process in which earthen materials are worn away and transported by natural forces such as wind or water. A similar process, weathering, breaks down or dissolves the rocks, but does not involve movement.



Picture showing the types of erosion



Picture showing soil erosion

Erosion will often occur after the rock has been disintegrated or altered through weathering. Weathered rock material will be removed from its original site and transported away by a natural agent. With both processes often operating simultaneously, the best way to distinguish erosion from weathering is by observing the transportation of material.

Importance of topsoil

It usually covers a layer of subsoil, which in turn covers the rock underneath, although when the soil is very thin, topsoil and subsoil may be indistinguishable. Topsoil is so important because **it contains all the nutrients that plants need to survive.**

Soil conservation

Effective control of soil erosion by water consists of minimizing the impact of raindrops and the velocity of running water on the soil surface. This task includes enhancing infiltrability and surface storage, improving soil structure, protecting the topsoil by a cover crop or a mulch of organic residues (e.g., straw) to prevent raindrops from striking the bare surface, minimizing cultivation, and performing it on the contour rather than up and down the slope, and avoiding both compaction and excessive soil pulverization. An ancient and still common practice of soil conservation is the shaping of sloping land using terraces or contour strips to reduce the inclination of the surface and the length of the slope segment, thereby checking the downhill acceleration of running water.

Control of wind erosion can be achieved using shelterbelts, which are parallel rows of trees or shrubs planted in a direction perpendicular to the prevailing direction of the wind. Additional measures are ensuring the presence of a protective vegetative cover or a mulch on the soil surface to keep it from the direct action of wind; keeping the topsoil in a cloddy rather than dusty or excessively pulverized state; enhancing soil aggregation by organic-matter enrichment; and maintaining the topsoil in a moist condition by evaporation control and, where possible, by light irrigation.

- manage surface runoff,
- protect bare exposed soil surfaces, and highly susceptible sites (e.g. steep slopes), and
- protect downstream watercourses from sedimentation and pollution.

Reasons to practice soil conservation

1. To maintain an adequate amount of organic matter and biological life in the soil. These two components account for 90 to 95 percent of the total soil productivity.
2. To ensure a secure food supply at reasonable prices. Soil conservation is proven to increase the quality and quantity of crop yields over the long term because it keeps topsoil in its place and preserves the long term productivity of the soil.
3. To grow enough food not only for ourselves; but also for people in third world countries where there are food shortages.
4. To save farmers money. Erosion is currently costing farmers over \$90 million a year in lost income due to lower crop yields, and the loss of nutrients from the soil.
5. To save citizens money. Soil erosion costs us an additional \$9.1 million each year, and probably much more according to recent research.
6. To improve water quality. All forms of life need clean water to survive. Agricultural and urban soil erosion are major sources of sedimentation and contamination of water supplies.
7. To improve wildlife habitat. Soil conservation practices such as providing bufferstrips and windbreaks, or replacing soil organic matter, greatly enhance the quality of the environment for wildlife of all kinds.
8. For aesthetic reasons. To provide more attractive and picturesque scenery.
9. To help create an environment free of pollution where we can live safely.
10. For the future of our children, so that they may have enough soil to support life. It has been said that the land has not so much been given to us by our forefathers but has been borrowed from our children.

Homework: Explain indepth any two of the ten reasons for soil conservation

References

- Bernard, Myrna et.al (2003) Science in Daily Life Book 3 (Unit 5) Ministry of Education
- <https://www.britannica.com/science/erosion-geology>