

Study Guide  
Chapter 6 Weathering and Soil Formation

**GPS:**

**6E5. Students will investigate the scientific view of how the earth's surface is formed.**

- d. Describe processes that change rocks and the surface of the Earth.
- f. Explain the effects of physical processes (plate tectonics, erosion, deposition, volcanic eruption, gravity) on geological features including oceans (composition, currents, and tides).
- h. Describe soil as consisting of weathered rocks and decomposed organic material.
- i. Explain the effects of human activity on the erosion of the Earth's surface.
- j. Describe methods of conserving natural resources such as water, soil, and air.

1. The Appalachians are more rounded and gently sloping and are covered with soil and plants and geologists infer that the mountains have been eroding for millions of years.
2. Weathering is the process that breaks down rock and other substances at Earth's surface.
3. Erosion is the removal of rock particles by wind, water, ice, or gravity.
4. Uniformitarianism is the principle that states that the same processes that operate today operated in the past.
5. Mechanical weathering is when rock is physically broken into smaller pieces by processes such as freezing and thawing, release of pressure, plant growth, actions of animals, and abrasion.
6. The term abrasion refers to the grinding away of rock by rock particles carried by water, ice, wind, or gravity.
7. In cool climates, the most important force of mechanical weathering is the freezing and thawing of water which is referred to as ice wedging.
8. Chemical weathering is the process that breaks down rock through chemical changes, changing the mineral composition and caused by the action of water, oxygen, carbon dioxide, living organisms, and acid rain.
9. Rust makes rock soft and crumbly and gives it a red or brown color and is caused by the chemical weathering by oxygen (oxidation).
10. Carbon dioxide dissolves in rainwater and in water that sinks through air pockets in soil making carbonic acid which weathers rocks such as marble and limestone.
11. Living organisms produce weak acids that slowly dissolve rock around the roots that chemically weather rock.
12. Acids from burning fuels mix with raindrops, fall as acid rain and causes very rapid chemical weathering.
13. Two factors that determine the rate at which weathering occurs are the type of rock and the climate.
14. Permeable means that a material is full of tiny, connected air spaces that allow water to seep through it and weathers chemically at a fast rate.
15. Chemical weathering occurs more quickly where the climate is both hot and wet.
16. Granite is often used in cool climate areas as a building stone because it weathers very slowly in cool climates.

17. Soil is loose, weathered material on Earth's surface in which plants can grow.
18. Bedrock is the solid layer of rock beneath the soil and gradually weathers into smaller and smaller particles that are the basic material of soil.
19. Humus is a dark-colored substance that forms as plant and animal remains decay and makes soil fertile, or rich in nutrients that plants need to grow.
20. Soil that is made up of about equal parts of clay, sand, and silt is called loam and is the best type of soil in which to grow plants in.
21. A soil horizon is a layer of soil that differs in color and texture from the layers above or below it.
22. Topsoil is a crumbly, dark brown soil that is a mixture of humus, clay, and other minerals.
23. Subsoil usually consists of clay and other particles washed down from above and has little humus.
24. Decomposers are the organisms like fungi, bacteria, and worms that break the remains of dead organisms into smaller pieces and digest them with chemicals.
25. Soil is one of Earth's most valuable natural resources because everything that lives on land, including humans, depends directly or indirectly on soil.
26. Whenever soil is exposed, water and wind can quickly erode it, but soil can be protected by plant cover.
27. Plowing removed the grass from the Great Plains and exposed the soil and during times of drought the topsoil quickly dried out, turned to dust, and blew away creating the Dust Bowl.
28. Soil conservation is the management of soil to prevent its destruction and can be conserved through contour plowing, conservation plowing and crop rotation.

29. Explain the following:

- a. contour plowing - the practice of plowing fields along the curves of a slope
- b. conservation plowing - farmers disturb the soil and its plant cover as little as possible
- c. crop rotation - a farmer plants different crops in a field each year.