

Agricultural Research Service

Weathering and Erosion 101: Hands-on Erosion Learning Activity

To learn more about erosion research, natural wonders of the U.S. transformed by erosion, or erosion in general visit:

USDA-ARS:

www.ars.usda.gov

Grand Canyon:

<https://www.nps.gov/grca/index.htm>

Natural Bridges National Monument, Utah:

<https://www.nps.gov/nabr/index.htm>

Devil's Tower, Wyoming:

<https://www.nps.gov/deto/index.htm>

Dust Bowl:

<https://www.history.com/topics/great-depression/dust-bowl>

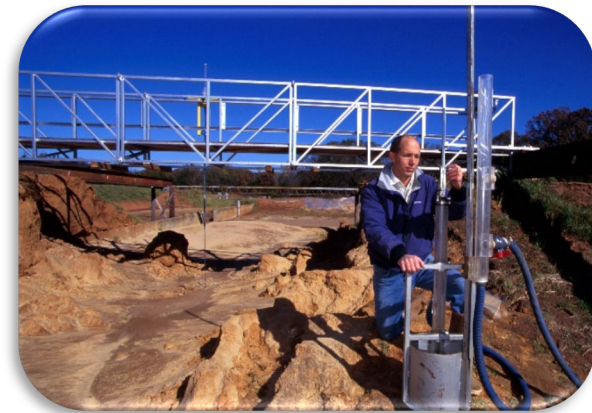
National Geographic:

<https://www.nationalgeographic.org/encyclopedia/erosion/>

For more information, contact:

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<https://www.ars.usda.gov/plains-area/stillwater-ok/hydraulic-engineering-research/>



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Activity Book

Weathering and Erosion 101

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Teaching Objective:

“To learn in a fun and meaningful way about the weathering and erosion processes of soil, one of our most important natural resources.”

Introduction:

Soil is a living and life-giving natural resource that promotes plant growth, makes a habitat for living things, and stores water. Soil is mixture of organic matter, minerals, gases, liquids, and organism, working together to support life. This mixture results in a multitude of colors giving bricks, pottery, and artwork a blend of different pigments. The process of weathering is the transformation of rock into soil through physical, chemical, or biological processes. Erosion is the next step in the process where soil is displaced to another location through movement caused by water, wind, and/or ice. Some of the greatest natural wonders of the U.S. including the Grand Canyon, Natural Bridges National Monument, and Devil’s Tower were carved and transformed in part by erosion and deposition of soil over time.

Materials:

Soil or Dirt of various colors and types such as
sand, silt, and/or clay

Dirt clods various sizes, shapes, and colors

Spray bottle (optional) Clear cup or measuring cup (2)

Water Gardening tool

Clear cup or measuring cup

Trays (aluminum or lined cardboard box)

Device with Internet access (optional) Pen and Paper/Journal

Activity Time: 1 hour

Procedures:

Experiment 1:

1. Gather up to four types of dirt or soil. Soil may include dirt clods.
2. Place the various soil types quartered sections of a tray. Soil can be placed dry, or you may want to add a little bit of water to build a landform.
3. Draw a picture of your soil(s) or landform(s), and provide a written description including but not limited to landform shape if applicable, soil texture, soil color, presence of organic matter, etc.
4. Use a spray bottle or water bottle to dribble drops of water on each soil to represent a light rain. In comparison, pour water from a measuring cup. Record your observations of erosion by water with pen and paper/journal.
5. Repeat steps 2 and 3.
6. Leave tray in a secure location outside during days there is no precipitation event. Observe the soil over a period of a few days, and record your daily observations as it relates to erosion by wind on a piece of paper or in a journal.

Experiment 2:

1. Fill a clear cup or clear measuring cup (2) with water.
2. Collect two dirt clods of different shapes, sizes, and soil types.
3. Draw a picture of the dirt clods and write a description of each that may include but not limited to diameter, soil color, soil texture, presence of organic matter, etc.
4. Drop one dirt clod in a cup of water, and record your observations at it relates to erosion by water on a piece of paper or in a journal.
5. Repeat step 4 with the other dirt clod and cup of water, and record your observations.

Reflect:

1. What is the difference between weathering and erosion?
2. Does soil make-up (e.g. soil type, organic matter, chemicals, etc.) make a difference on the rate which a soil erodes? Why?
3. Explore www.ars.usda.gov; and write a narrative how soil erosion research makes a difference in dam safety, crop production, and water quality.