



# Erosion Relay

## Materials:

- Science notebooks or journals
- LEGOs®, blocks, or another stackable object, one per student
- Large, open space
- Optional: trowel, hand lenses, tray or cookie sheet, cones

## Standards and Curricular Connections

### Next Generation Science Standards

**2-ESS1-1** Use information from several sources to provide evidence that Earth events can occur quickly or slowly

**4-ESS2-1** Make observations and measurements to provide evidence of the effects of weathering and erosion

**5-ESS2-1** Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and atmosphere interact

## Overview & Objectives

Rocks and minerals make up about 45% of the soil in a healthy garden. Minerals are a vital part of soil and determine soil structure. The mineral component of soil is created through weathering, erosion, and deposition. Soil creation and landscape changes occur over a long period of time. During this lesson, students will observe soil, act out the processes that form the mineral part of soil, and figure out how to minimize the adverse effects of erosion.

## Students will:

- Model the processes of weathering, erosion, and deposition
- Develop methods to mitigate the effects of erosion

## Pre-Activity Questions:

1. Why is soil important to the school garden?
2. Do you see rocks in the soil? What size and shape are they?
3. Are rocks always the same size and shape?
4. How did rocks get into the soil? Where did they come from?

## Activity

- Before beginning the relay, have students examine the soil closely. Either provide a soil sample from the garden or give each student a trowel to dig in a dormant garden bed. Each student should observe and feel the soil, answering the following questions? Do they see any rocks in the soil? What size are the rocks? How much of the soil do they think is rock? Where did the rocks come from?
- After the students have observed the soil for about 5 minutes, bring the class back together.



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## Strategies for Engagement

- Use wood scrap pieces for the relay. They can later be painted and repurposed into plant labels
- Any available object can work - rocks, small sticks, even backpacks.
- Depending on class ability, have the students crab-walk or skip instead.

## Resources

- Pounders, Sarah. Lesson 3: Soil Exploration. In *Garden Adventures: Exploring Plants with Young Children* (p 56-57). South Burlington, VT: National Gardening Association, 2010.
- Soil Science Society of America, [www.soils4teachers.org](http://www.soils4teachers.org)
- University of Illinois Extension, Claude's Got the Scoop on Soil, <http://extension.illinois.edu/soil>
- US Department of Agriculture soil education website, [www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu](http://www.nrcs.usda.gov/wps/portal/nrcs/main/soils/edu)

## Activity

- Lead a discussion about how the rocks got into the soil. Remember the rocks could be very fine clay particles. **Weathering** is when rocks are broken down into smaller particles because of natural forces like wind, water, freezing, and living things acting on them. Show a picture of a weathered statue or headstone. **Erosion** is when those smaller particles of rock are moved from one location to another. Examples include rivers carrying silt and landslide. **Deposition** is when the particles of rock moved by erosion and weathering are dropped off at a new location.
- For the relay, students are going to be forces of change - wind and water. Divide the class into four teams. Each team gets one block or LEGO® per member.
- Next, create the playing field, or landscape, for the relay. You will need open space that is approximately 20'x30', depending on how far you want your students to race. Mark off one end of the playing space with cones and have each team create a structure or tower with their blocks on the line.
- At the opposite end of the field and across from their tower of blocks, the teams should line up. If available, place a tray at the start of each team's line.
- Explain that the students are about to become wind and water and change the "landscape" or their tower of blocks. One at a time, students walk or run to the opposite end of the field. Students take one block (weathering), carry it back to the group (erosion), and drop it off on the tray (deposition), yelling out each geological process as it occurs. Students have to build the tower on the tray. The first team to build a new structure, with all their blocks, wins.
- Wrap up the relay by asking students what processes the game was mimicking. How would real weathering, erosion, and deposition be different from the game? Would these geological processes take the same amount of time?



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## Gateway Greening

### Resources

Connect with us on Facebook to discover upcoming Youth Garden Institute workshops or join the Gateway Greening Educators Group to connect with other teachers:



@ GatewayGreening

Discover season-specific gardening how-to's and examples of current lessons:



@ gatewaygreening

Looking for Field Trip opportunities or need to ask a question about our education services? Please contact [education@gatewaygreening.org](mailto:education@gatewaygreening.org) or 314-588-9600 ext 107

## Additional Activities & Follow Up

- Go on an erosion, weathering, and deposition scavenger hunt. The scavenger hunt works particularly well after a rainy day or watering session. Have each student find three examples of erosion, weathering, and deposition, if possible. Explore the garden, schoolyard, and outside of buildings. Which processes were easiest to find?
- Use the "Is it Erosion?" probe as a pre and post-assessment. Found in Keeley, P. and Tucker, L. (2016) *Uncovering Student Ideas in Earth and Environmental Science*. NSTA Press, Arlington, VA.
- Investigate where erosion happens the quickest, a garden bed with or without plants. This experiment works best on berms. Have students predict if a garden bed with plants will have more or less erosion. How do roots impact the soil? Then transplant a seasonally appropriate crop into half the bed, leaving the other half bare. Prep, care for, and water the soil the same. Each week, make observations about the soil, using pictures and drawings to illustrate conclusions. At the end of the experiment, have students figure out a natural solution to an eroding hillside.
- Explore how water volume affects erosion. Have students build a small mound of soil (or use existing compost and soil piles). First, have students spray the piles with water from a spray bottle. Then, unscrew the cap and dump the rest of the water on the pile. When did the water erode the soil more? Of which real life phenomena is this experiment an example?