

# WEATHERING

Weathering Instructional Case: A series of student-centered science lessons

## Authors

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## Overview

In the Weathering Instructional Case, students learn about how both chemical and mechanical weathering of rocks are important surficial processes. The “Essential Question” that students will address is: What makes large rocks change into small rocks? The overarching student development goal is for students to engage in constructive argument based on their data. This seven-day unit (which can be shortened) will bring students through several hands-on, easily-managed labs. After completing this instructional case, students will be able to define weathering and explain how rocks are changed by weathering. Students will also be able to distinguish between mechanical and chemical weathering and identify and name different agents of weathering.



*Yukon River Source: USGS*

**Lesson 1:** The teacher will assess the students’ prior knowledge on weathering and erosion using the Page Keeley probe, “Mountain Age”. This probe allows the teacher to assess misconceptions and start the lesson sequence with a “Friendly Talk” probe where students will build their group and scientific process skills. Students will receive an introduction to the Claim-Evidence-Reasoning (CER) protocol and learn how to construct scientific explanations based on evidence and reasoning.

**Lesson 2:** Students will create a simple model of mechanical weathering using gypsum sidewalk chalk and salt. The salt as the agent of abrasion slowly weathers the sidewalk chalk. Because of the color of

the chalk, students can visualize the weathering taking place. Students engage in the practice of modeling and use the model to construct explanations on the phenomenon of mechanical weathering.

**Lesson 3:** After engaging in a pre-assessment probe and an inquiry-based activity, the students will now be able to place the information and vocabulary into context. Students will be able to identify and recognize the important factors that affect the rates of weathering. Students will also be able to differentiate between mechanical and chemical weathering.

**Lesson 4:** Students will now explore chemical weathering and analyze dissolution rates of effervescent tablets. Students will then explore the practice of planning and carrying out investigations. Students will explore the effect of temperature on dissolution rates using different temperatures of water.

**Lesson 5:** Students will culminate this instructional case with in an inquiry-based “Weathering Competition” in which student groups must choose weathering agents to reduce the mass of their rock and justify their choices (hypothesis testing). Different groups will present their data, analyze class data and determine the most effective weathering agents (following the C-E-R format).



*Pebbles on a Beach*  
Gary Halvorson, Oregon State Archives