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Weathering, Erosion, and Deposition Lab Activity

Aligned With All Published National Standards

ward's science

IMGN 250 8058

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framework for K-12 science education © 2012

* The Dimension I practices listed below are called out as **bold** words throughout the activity.

DIMENSION 1 Science and Engineering Practices

X	Asking questions (for science) and defining problems (for engineering)		Use mathematics and computational thinking
X	Developing and using models	X	Constructing explanations (for science) and designing solutions (for engineering)
X	Planning and carrying out investigations		Engaging in argument from evidence
X	Analyzing and interpreting data	X	Obtaining, evaluating, and communicating information

DIMENSION 2 Cross Cutting Concepts

	Patterns	X	Energy and matter: Flows, cycles, and conservation
X	Cause and effect: Mechanism and explanation	X	Structure and function
X	Scale, proportion, and quantity	X	Stability and change
X	Systems and system models		

DIMENSION 3 Core Concepts

Discipline	Core Idea Focus
Earth and Space Science	ESS2: Earth's Systems

X Indicates standards covered in activity

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Middle School Standards Covered	High School Standards Covered
MS.ESS2-2: Construct an explanation based on evidence for how geoscience processes have changed Earth's surface at varying time and spatial scales.	HS.ESS2-1: Develop a model to illustrate how Earth's internal and surface processes operate at different spatial and temporal scales to form continental and ocean-floor features.
MS.ESS2-5: Collect data to provide evidence for how the motions and complex interactions of air masses results in changes in weather conditions.	HS.ESS2-2: Analyze geoscience data to make the claim that one change to Earth's surface can create feedbacks that cause changes to other Earth's systems.
	HS.ESS2-4: Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

(continued on next page)

standards/learning objectives

national science education standards © 1996

Content Standards (K-12)			
X	Systems, order, and organization	X	Evolution and equilibrium
X	Evidence, models, and explanation		Form and Function
X	Constancy, change, and measurement		

Earth and Space Science Standards Middle School		Earth and Space Science Standards High School	
X	Structure of the Earth System	X	Energy in the Earth System
		X	Geochemical cycles

x Indicates standards covered in activity

benchmarks for science literacy (AAAS, © 1993)

1. The Nature of Science	1B: Scientific Inquiry
4. The Physical Setting	4B: The Earth
	4C: Processes That Shape the Earth
5. The Living Environment	5E: Flow of Matter and Energy
11.Common Themes	11A. Systems
	11B. Models

activity objectives:

- Part 1: Mechanical Weathering - In this activity, students simulate mechanical weathering by abrasion, and observe that the rate of weathering varies for different types of rock and rocks in wet and dry environments.
- Part 2: More Mechanical Weathering - In this activity, students simulate weathering caused by frost wedging, thermal expansion and contraction, and biotic agents. Students will do this by a) soaking dry beans overnight in a small container, and observing the effects of expansion on the container; and b) repeatedly freezing and thawing wet and dry rock samples, and observing the effects on various types of rocks.
- Part 3: Chemical Weathering - In this activity, students place rocks in either water or a dilute HCl solution to simulate chemical weathering. Students then compare the data for each type of rock to determine which is affected by chemical weathering. Students will also perform an activity that demonstrates the formation of carbonic acid in a reaction between carbon dioxide (air in a balloon) and water.