Rocks

Earth & Space Science | Lesson Guide

2nd Grade

Photo Description

This picture shows a house with a big pile of flat rocks stacked up in front of it. The rocks are different colors like brown, gray, and green. There are plants growing around the rock pile and trees hanging over the house.

Scientific Phenomena

The Anchoring Phenomenon shown here is weathering and erosion of rock materials. The flat, layered appearance of these stacked stones demonstrates how rocks break down over time through natural processes like wind, water, ice, and temperature changes. These sedimentary rock pieces likely formed from layers of sediment that were compressed over millions of years, then broken apart by weathering forces and transported by erosion to be collected and used for landscaping.

Core Science Concepts

1. Rock Formation and Types: These appear to be sedimentary rocks that formed in layers over long periods of time
2. Weathering Process: Natural forces like rain, wind, and temperature changes break rocks into smaller pieces
3. Erosion and Transportation: Moving water and wind carry rock pieces from one place to another
4. Human Use of Natural Materials: People collect and use weathered rock pieces for building and decoration

Pedagogical Tip:

Have students bring in small rocks from home or the playground to examine with magnifying glasses. This hands-on exploration helps them notice details like texture, color, and layers that connect to the larger concepts of rock formation.

UDL Suggestions:

Provide multiple ways for students to represent their rock observations - through drawings, verbal descriptions, or physical sorting activities. This supports different learning preferences and abilities while building the same core understanding.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny pieces of minerals and sediments are constantly being broken off rocks by chemical reactions with water and air, creating the smaller particles that eventually form new rocks.

2. Zoom Out: These rocks are part of the larger rock cycle system where mountains are slowly worn down by weathering and erosion, with the pieces eventually flowing to oceans where they may form new sedimentary rocks over millions of years.

Discussion Questions

1. What do you think made these rocks flat and smooth? (Bloom's: Analyze | DOK: 2)
2. How do you think these rocks got from wherever they formed to this yard? (Bloom's: Apply | DOK: 2)
3. What might happen to these rocks if they stayed outside for 100 more years? (Bloom's: Evaluate | DOK: 3)
4. Why do you think people choose to use rocks like these for decorating their yards? (Bloom's: Analyze | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Rocks never change - they stay the same forever."
   Clarification: Rocks are constantly changing through weathering, just very slowly over long periods of time.

2. Misconception: "Only big storms and earthquakes can break rocks."
   Clarification: Even gentle rain, daily temperature changes, and plant roots can slowly break rocks apart over time.

3. Misconception: "All rocks are the same inside and outside."
   Clarification: Many rocks have layers or different materials inside that show how they formed over time.

NGSS Connections

- Performance Expectation: 2-ESS1-1 - Use information from several sources to provide evidence that Earth events can occur quickly or slowly
- Disciplinary Core Idea: 2-ESS1.C - Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe
- Crosscutting Concept: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

* Weathering: The slow breaking down of rocks by wind, water, and temperature changes
* Erosion: The movement of rock pieces from one place to another by wind or water
* Sedimentary: A type of rock made from layers of materials pressed together over time
* Layers: Flat sections stacked on top of each other, like pages in a book
* Minerals: The tiny building blocks that make up rocks

External Resources

Children's Books:
- Rocks Hard, Soft, Smooth, and Rough by Natalie Rosinsky
- Let's Go Rock Collecting by Roma Gans
- If You Find a Rock by Peggy Christian

YouTube Videos:
- "Weathering and Erosion for Kids" - Simple explanation of how rocks change over time with clear animations: https://www.youtube.com/watch?v=Qu7j0w4hNuU
- "Types of Rocks | Science for Kids" - Kid-friendly overview of sedimentary, igneous, and metamorphic rocks: https://www.youtube.com/watch?v=ZMULCXXtV_Y