

Photo Description



A big rock sits on the ground covered with green moss and white patches. The rock has different colors and textures on its surface. Brown leaves are scattered around the rock on the forest floor.

Scientific Phenomena

This image represents the Anchoring Phenomenon of weathering and biological colonization of rock surfaces. The rock shows evidence of physical and chemical weathering processes, where water, temperature changes, and atmospheric gases have altered the rock's surface over time. The moss and lichen growth demonstrates how living organisms can establish themselves on seemingly barren surfaces, creating small ecosystems. The different colored patches (green moss, white/gray lichens, and various rock colors) show how both non-living and living factors work together to change Earth's surface materials over long periods.

Core Science Concepts

1. Weathering: Rocks change over time when exposed to air, water, and temperature changes
2. Living vs. Non-living: The rock is non-living, but moss and lichens are living things that can grow on it
3. Habitats: Even a rock can be home to small living things like moss
4. Earth Materials: Rocks are natural materials that come in different colors and textures

Pedagogical Tip:

Use concrete examples and hands-on exploration when teaching about rocks and living things. Let students touch different rock samples and use magnifying glasses to observe moss or lichens up close, as kindergarteners learn best through sensory experiences.

UDL Suggestions:

Provide multiple ways for students to explore this concept: tactile rock collections, visual comparison charts of living vs. non-living things, and kinesthetic activities like acting out how moss "moves in" to live on rocks. This supports different learning preferences and abilities.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, tiny root-like structures called rhizoids help moss attach to the rock surface, while lichen is actually two organisms (fungus and algae) working together in a partnership called symbiosis.
2. Zoom Out: This rock and its living residents are part of a larger forest ecosystem where decomposing leaves provide nutrients, rainfall provides water, and the rock serves as habitat for small organisms that are part of the food web.

Discussion Questions

1. "What living things can you see growing on this rock?" (Bloom's: Identify | DOK: 1)
2. "How do you think the moss gets what it needs to live on this rock?" (Bloom's: Analyze | DOK: 2)
3. "What might happen to this rock if it stayed outside for many more years?" (Bloom's: Predict | DOK: 2)
4. "How is this rock similar to and different from the rocks in our school playground?" (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Rocks are not important because they're not alive."

Clarification: Rocks provide homes and surfaces for living things and are an important part of nature.

2. Misconception: "The green and white stuff is just dirt on the rock."

Clarification: The green moss and white lichens are actually living things that grow on the rock.

3. Misconception: "Rocks never change."

Clarification: Rocks change slowly over time due to weather, water, and other natural forces.

Cross-Curricular Ideas

1. Math - Sorting and Counting: Collect different rocks from around the school and sort them by size, color, or texture. Count how many rocks have moss on them versus rocks without moss. Create simple bar graphs showing the results.
2. ELA - Rock and Moss Stories: Read "A Rock Is Lively" and have students dictate or draw stories about what a rock might experience in the forest. Create a class book titled "Our Rock Friends" with student illustrations and simple sentences about rocks and moss.
3. Art - Nature Collages: Use collected natural materials (leaves, twigs, moss samples if available) to create collages that show a forest habitat. Students can glue materials onto paper to recreate the rock and forest floor scene from the photo.
4. Social Studies - Caring for Nature: Discuss how we can protect rocks and plants in parks and playgrounds. Create simple classroom rules for outdoor exploration, such as "Look but don't remove moss from rocks" and "Leave nature as we find it."

STEM Career Connection

1. Geologist: A scientist who studies rocks, soil, and minerals. Geologists explore the Earth and learn how rocks form, change, and help us understand our planet. They might collect rock samples and use special tools to examine them closely. Average Annual Salary: \$93,580
2. Botanist: A scientist who studies plants, including mosses and lichens. Botanists explore forests and gardens to learn how plants grow and what they need to survive. They might use magnifying glasses to observe tiny plants like moss up close. Average Annual Salary: \$65,760
3. Environmental Scientist: A person who protects nature and studies how living things interact with rocks, soil, water, and air. Environmental scientists help keep forests healthy and teach people how to care for the Earth. Average Annual Salary: \$73,230

NGSS Connections

Performance Expectation: K-ESS2-2: Construct an argument supported by evidence for how plants and animals can change the environment to meet their needs.

Disciplinary Core Ideas:

- K-ESS2.E: Plants and animals can change their environment

Crosscutting Concepts:

- Systems and System Models
- Stability and Change

Science Vocabulary

- * Rock: A hard, natural material that comes from the Earth
- * Moss: A small, soft green plant that grows in damp places
- * Habitat: A place where living things can find what they need to survive
- * Weathering: The slow process of rocks changing due to wind, water, and weather
- * Surface: The outside or top part of something

External Resources

Children's Books:

- "A Rock Is Lively" by Dianna Hutts Aston
- "The Magic School Bus Inside the Earth" by Joanna Cole
- "National Geographic Readers: Rocks and Minerals" by Kathleen Weidner Zoehfeld