Moss on Rock

Earth & Space Science | Lesson Guide

1st Grade

Photo Description

This picture shows green moss growing on gray and pink rocks. The moss looks soft and fuzzy. The rocks have different colors and the moss covers parts of them like a green blanket.

Scientific Phenomena

The Anchoring Phenomenon shown here is biological weathering and pioneer species colonization. Moss is acting as a pioneer organism that can survive in harsh conditions with minimal soil. The moss is slowly breaking down the rock through both physical processes (roots growing into cracks) and chemical processes (releasing weak acids that dissolve minerals). This demonstrates how living things can change their environment over very long periods of time, creating conditions for other plants to eventually grow.

Core Science Concepts

1. Living vs. Non-living: Moss is alive and grows, while rocks are non-living but can be changed by living things
2. Basic Needs of Living Things: Moss needs water, air, and nutrients to survive, even in rocky places
3. How Living Things Change Their Environment: Plants like moss can slowly break down rocks over time
4. Adaptation: Moss has special features that help it live in places where other plants cannot grow

Pedagogical Tip:

Use real moss samples (if available locally) for students to observe with magnifying glasses. This tactile experience helps first graders connect the abstract concept of "living things" to concrete observations they can make.

UDL Suggestions:

Provide multiple ways for students to show their understanding: drawing what they observe, acting out how moss grows, or creating a simple before/after model with clay and green materials to represent rock weathering over time.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, moss doesn't have true roots like other plants. Instead, it has tiny thread-like structures called rhizoids that anchor it to surfaces and help absorb water and nutrients directly through its leaves.

2. Zoom Out: This moss-covered rock is part of a larger ecosystem where pioneer species like moss prepare the environment for other plants by creating small pockets of soil as they break down rock, eventually leading to forest succession over hundreds of years.

Discussion Questions

1. What do you notice about where the moss is growing on these rocks? (Bloom's: Observe | DOK: 1)
2. Why do you think moss can grow on rocks when other plants need soil? (Bloom's: Analyze | DOK: 2)
3. What might happen to these rocks if moss keeps growing on them for many, many years? (Bloom's: Predict | DOK: 3)
4. How is moss the same as other plants you know, and how is it different? (Bloom's: Compare | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Rocks can't change because they're not alive"
   Clarification: While rocks aren't alive, living things like moss can slowly change rocks over very long periods of time
2. Misconception: "Plants need dirt to grow"
   Clarification: Some plants like moss can grow directly on rocks and get what they need from air and rainwater
3. Misconception: "Moss is just green stuff, not a real plant"
   Clarification: Moss is a living plant that grows, needs water and air, and can make baby moss plants

Cross-Curricular Ideas

1. Math - Patterns and Counting: Have students observe the moss patterns on the rocks and create repeating patterns using green paper or paint. They can also count how many moss patches they see on a rock or sort rocks by size.

2. ELA - Descriptive Writing and Vocabulary: Students can draw the moss-covered rocks and label the colors they see (green, gray, pink, brown). Create a class word wall with adjectives like "soft," "fuzzy," "bumpy," and "colorful" to describe what they observe.

3. Art - Nature Collage and Texture: Students can create a mixed-media collage using real moss samples (collected safely), colored paper, and paint to represent rocks and moss. This allows them to explore texture through tactile art while reinforcing the science concepts.

4. Social Studies - How Humans Use Natural Resources: Discuss how moss-covered rocks can be found in gardens, parks, and forests in your community. Take a nature walk to find moss in your local environment and talk about caring for natural spaces.

STEM Career Connection

1. Botanist (Plant Scientist): A botanist is a scientist who studies plants like moss, flowers, and trees. They observe how plants grow, what they need to survive, and how they help other living things. Botanists might work in gardens, forests, or laboratories to learn more about plants and help protect them. Average Salary: $63,000 USD

2. Geologist (Rock Scientist): A geologist studies rocks, minerals, and soil. They observe how rocks change over time, how weathering happens, and what rocks tell us about Earth's history. Geologists might dig up rocks, examine them closely, and figure out how old they are. Average Salary: $94,000 USD

3. Park Ranger or Naturalist: A park ranger takes care of forests, parks, and natural areas where plants like moss grow. They teach people about nature, protect the environment, and observe how living things and rocks interact in outdoor spaces. Average Salary: $37,000 USD

NGSS Connections

- Performance Expectation: K-LS1-1 - Use observations to describe patterns of what plants and animals (including humans) need to survive
- Disciplinary Core Ideas: K-LS1.C - Organization for Matter and Energy Flow in Organisms
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

* Moss: A small green plant that can grow on rocks and trees without needing soil
* Living: Something that grows, needs food and water, and can make babies
* Non-living: Something that does not grow or need food and water, like rocks
* Environment: All the things around a living thing, like air, water, and rocks
* Observe: To look carefully and notice details about something

External Resources

Children's Books:
- A Log's Life by Wendy Pfeffer
- Rocks and Minerals by Steve Tomecek
- What Is a Plant? by Bobbie Kalman