Moss on Rock

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

Green moss grows on gray and pink rocks. The moss is soft and fuzzy. The rocks have different colors like pink, gray, and green.

Scientific Phenomena

This image shows biological weathering as an anchoring phenomenon. The moss is breaking down the rock very slowly by growing on it and making tiny cracks bigger. The moss also holds water against the rock, which helps break it apart over time. This is one way that living things change the Earth's surface by breaking big rocks into smaller pieces.

Core Science Concepts

1. Living vs. Non-living Things: Moss is alive and grows, while rocks are not alive but can be changed by living things.
2. Weathering Process: Living things like moss can slowly break down rocks by growing in small cracks and holding water.
3. Habitats: Moss can live on rocks because it gets what it needs - water, air, and a place to attach.
4. Earth's Surface Changes: The Earth's surface changes slowly over time when living things interact with rocks and soil.

Pedagogical Tip:

Use real moss and rocks for hands-on exploration. Let students touch both materials to feel the difference between living moss (soft, spongy) and non-living rock (hard, rough). This concrete experience helps kindergarteners understand the living vs. non-living concept.

UDL Suggestions:

Provide multiple ways to explore this concept: visual observation of the photo, tactile exploration with real specimens, and kinesthetic activities like acting out how moss "hugs" rocks. This supports different learning preferences and abilities in your kindergarten classroom.

Zoom In / Zoom Out

1. Zoom In: The moss has tiny root-like parts called rhizoids that grow into small cracks in the rock. These parts release acids that slowly dissolve minerals in the rock, making the cracks bigger over time.
2. Zoom Out: This weathering process happens all over Earth and helps create soil. When rocks break down, they mix with dead plants and animals to make the soil that helps bigger plants grow in forests and gardens.

Discussion Questions

1. What do you notice about how the moss is growing on the rock? (Bloom's: Observe | DOK: 1)
2. How do you think the moss is able to live on the hard rock? (Bloom's: Analyze | DOK: 2)
3. What might happen to this rock after many, many years with moss growing on it? (Bloom's: Predict | DOK: 2)
4. Where else have you seen moss growing in nature? (Bloom's: Remember | DOK: 1)

Potential Student Misconceptions

1. Misconception: "Rocks never change because they are hard."
   Clarification: Rocks do change, but very slowly over long periods of time. Living things like moss can help break them down.

2. Misconception: "Moss is hurting the rock."
   Clarification: Moss isn't trying to hurt the rock - it's just trying to find a good place to live and grow.

3. Misconception: "Only big things can break rocks."
   Clarification: Even tiny living things like moss can slowly change rocks over many years.

Cross-Curricular Ideas

1. Math - Patterns and Counting: Have students observe and count the patches of moss on rocks. Create a simple graph showing "rocks with lots of moss" vs. "rocks with little moss." This connects to K.CC (counting and cardinality) and K.MD (measurement and data).

2. ELA - Nature Journaling: Students can draw pictures of the moss and rocks, then dictate or write simple sentences about what they observe (e.g., "The moss is green and soft"). This supports K.W.2 (writing) and speaking/listening standards while building vocabulary.

3. Art - Texture Exploration: Students create textured collages or rubbings using sandpaper, felt, and other materials to represent the bumpy rocks and soft moss. This helps them understand that different objects have different textures, connecting sensory awareness to artistic expression.

4. Social Studies - Our Natural World: Discuss where moss grows in your local community. Take a nature walk to find moss on rocks, trees, or buildings near the school. This builds environmental awareness and appreciation for the natural features of their neighborhood.

STEM Career Connection

1. Geologist - A scientist who studies rocks and soil to learn how Earth changes over time. Geologists look at rocks, dig in the ground, and figure out how weathering and other processes shape our planet. They might visit places like mountains and canyons to collect rock samples and study them. Average Salary: $93,000/year

2. Environmental Scientist - A scientist who studies living things like plants and how they interact with rocks, soil, and water in nature. Environmental scientists protect Earth by learning how moss, plants, and animals help keep our planet healthy. They might work outdoors in forests or gardens. Average Salary: $76,000/year

3. Botanist - A scientist who studies plants, including tiny plants like moss. Botanists learn where different plants grow, what they need to survive, and how they help other living things. They might grow moss in labs or study it in nature. Average Salary: $63,000/year

NGSS Connections

- Performance Expectation: K-ESS2-1 - Use and share observations of local weather conditions to describe patterns over time
- Disciplinary Core Ideas: K-ESS2.D - Human impact on Earth and the environment
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence

Science Vocabulary

* Moss: A small, soft green plant that grows in damp places.
* Weathering: When rocks slowly break down into smaller pieces.
* Living: Something that grows, needs food and water, and can make more of itself.
* Non-living: Something that does not grow or need food and water.
* Habitat: The place where a plant or animal lives and gets what it needs.

External Resources

Children's Books:
- A Rock Is Lively by Dianna Hutts Aston
- Rocks and Minerals by Rebecca Hirsch
- Who Grew My Soup? by Tom Darbyshire