

## Photo Description



This large rock is covered with green moss and light-colored patches called lichen. The rock sits on the forest floor surrounded by fallen leaves and grass. Over time, living things have made their home on the hard rock surface.

## Scientific Phenomena

The Anchoring Phenomenon is biological weathering - the process where living organisms break down rocks over time. The moss and lichen growing on this rock are slowly breaking it apart through chemical processes. These organisms produce weak acids that dissolve minerals in the rock, creating small cracks and spaces where they can grow. This is a form of weathering that happens very slowly, taking many years to create visible changes.

## Core Science Concepts

1. Weathering: Natural processes break down rocks into smaller pieces over long periods of time
2. Living vs. Non-living Interactions: Living things (moss, lichen) can change non-living things (rocks) in their environment
3. Habitat: Rocks can provide homes for small organisms like moss and lichen
4. Time and Change: Changes in nature happen over different time scales - some very slowly like rock weathering

### Pedagogical Tip:

Use a hand lens or magnifying glass to help students observe the detailed textures of moss and lichen. This makes the invisible more visible and engages students in authentic scientific observation practices.

### UDL Suggestions:

Provide multiple ways for students to document their observations: drawing, verbal descriptions, or taking photos. Some students may excel at artistic representation while others prefer written descriptions of what they observe.

## Zoom In / Zoom Out

1. Zoom In: At the microscopic level, lichen is actually two organisms (fungus and algae) living together. The fungus produces acids that slowly dissolve rock minerals, creating tiny spaces for growth and releasing nutrients.
2. Zoom Out: This weathering process is part of the larger rock cycle where rocks are constantly being broken down and reformed. The small rock particles will eventually become soil that supports larger plants and entire forest ecosystems.

### Discussion Questions

1. What evidence do you see that this rock has been changing over time? (Bloom's: Analyze | DOK: 2)
2. How might this rock look different in 100 years if the moss and lichen keep growing? (Bloom's: Predict | DOK: 3)
3. What other living things might be able to break down rocks? (Bloom's: Apply | DOK: 2)
4. Why do you think moss and lichen can grow on rocks but grass cannot? (Bloom's: Evaluate | DOK: 3)

### Potential Student Misconceptions

1. Misconception: "Rocks never change because they are so hard and strong."  
Clarification: Rocks do change, but very slowly over long periods of time through weathering processes.
2. Misconception: "Only wind and water can break down rocks."  
Clarification: Living things like plants, moss, and lichen can also break down rocks through biological weathering.
3. Misconception: "Moss and lichen are the same thing."  
Clarification: Moss is a small plant, while lichen is actually two different organisms (fungus and algae) living together.

### 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 Ideas: 2-ESS1.C - Some events happen very quickly; others occur very slowly, over a time period much longer than one can observe
- Crosscutting Concepts: Patterns - Patterns in the natural world can be observed and used as evidence

### Science Vocabulary

- \* Weathering: The process of breaking down rocks into smaller pieces
- \* Lichen: A living thing made of fungus and algae growing together
- \* Moss: A small, soft green plant that grows in damp places
- \* Organism: Any living thing, like plants, animals, or fungi
- \* Habitat: The place where a living thing makes its home
- \* Minerals: The natural materials that make up rocks

### External Resources

Children's Books:

- Rocks and Minerals by Rebecca Hirsch
- A Rock Is Lively by Dianna Hutts Aston
- The Magic School Bus Inside the Earth by Joanna Cole

YouTube Videos:

- "Weathering and Erosion for Kids" - Educational overview of how rocks break down over time: <https://www.youtube.com/watch?v=XjVtmOtT-mU>
- "What is Lichen?" - Kid-friendly explanation of these fascinating organisms: <https://www.youtube.com/watch?v=UYyOcGCUhQw>