# Fossil in Sedimentary Rock

Earth & Space Science | Lesson Guide

Kindergarten

## Photo Description

This picture shows a fossil shell in rock. The shell has lines that spread out like a fan. It looks like it was pressed into the rock a very long time ago.

## Scientific Phenomena

This image represents the Anchoring Phenomenon of fossil formation through preservation. This brachiopod shell fossil was created when an ancient marine animal died and its shell was buried in sediment. Over millions of years, the sediment turned to rock while the shell left its impression, creating a permanent record of life from long ago. This demonstrates how Earth's materials can preserve evidence of past life forms.

## Core Science Concepts

1. Fossils are evidence of living things from long ago - This shell fossil shows us that different animals lived on Earth before we were here
2. Rocks can form layers over time - The animal's shell got covered by mud and sand that slowly turned into rock
3. Patterns in nature - The fan-like ridges on this shell show how living things have special shapes and patterns
4. Earth changes slowly over time - It took millions of years for this fossil to form in the rock

**Pedagogical Tip:**

Use concrete, hands-on experiences like making play dough "fossils" by pressing shells or leaves into the dough. Kindergarteners learn best when they can touch and manipulate materials to understand abstract concepts like "long ago."

**UDL Suggestions:**

Provide multiple ways to explore fossils - real specimens to touch, large photographs to examine with magnifying glasses, and simple drawings to trace. This supports different learning styles and abilities while building vocabulary through multi-sensory experiences.

## Zoom In / Zoom Out

1. Zoom In: Inside the original shell were tiny chambers and soft body parts of the brachiopod animal that filtered food from ocean water. The hard shell protected the soft animal inside, just like how a turtle's shell protects it today.

2. Zoom Out: This fossil is part of rock layers that tell the story of an ancient ocean that covered this area millions of years ago. Many similar fossils found together help scientists understand what the whole underwater environment was like long before humans existed.

## Discussion Questions

1. What do you notice about the lines on this shell fossil? (Bloom's: Remember | DOK: 1)
2. How do you think this shell got stuck in the rock? (Bloom's: Analyze | DOK: 2)
3. What does this fossil tell us about what lived on Earth long ago? (Bloom's: Evaluate | DOK: 3)
4. If you found this fossil, what questions would you want to ask about it? (Bloom's: Create | DOK: 2)

## Potential Student Misconceptions

1. Misconception: "Fossils are just old rocks that look like animals"
   Clarification: Fossils are actual remains or impressions of real animals and plants that lived long ago - they show us evidence of life, not just rock shapes

2. Misconception: "All animals that die become fossils"
   Clarification: Only very few animals become fossils because special conditions are needed - most animals decompose completely without leaving fossil evidence

3. Misconception: "Fossils formed recently, maybe when grandparents were young"
   Clarification: Most fossils are millions of years old - much, much older than any person who has ever lived

## Cross-Curricular Ideas

1. Math - Patterns & Counting: Have students trace the fan-like ridges on the fossil with their fingers and count them. Create simple patterns using lines or shells (big shell, small shell, big shell, small shell). This connects to recognizing and extending repeating patterns.

2. ELA - Storytelling & Descriptive Words: Read "Fossils Tell of Long Ago" by Aliki together, then have students dictate or draw a story about "What if you were the little animal that became a fossil?" Use descriptive words like bumpy, smooth, striped, and hard to describe the fossil's texture and appearance.

3. Art - Fossil Imprints: Students create their own fossil imprints by pressing shells, leaves, or toy animals into play dough or salt dough. This hands-on creation mirrors the natural process of fossilization and allows them to understand how impressions form.

4. Social Studies - Community Helpers: Invite a local paleontologist, geologist, or museum educator to visit the classroom to show real fossils and talk about how scientists learn about the past. This builds awareness of community experts and different jobs people do.

## STEM Career Connection

1. Paleontologist - A scientist who studies fossils and learns about animals and plants that lived long, long ago. Paleontologists dig up fossils, clean them carefully, and figure out what kind of animals they were and how they lived. It's like being a detective for creatures from millions of years ago!
   Average Annual Salary: $65,000

2. Geologist - A scientist who studies rocks and learns how Earth changes over time. Geologists look at rocks and fossils to understand the history of our planet and how mountains, oceans, and deserts formed. They help us understand where rocks and minerals come from.
   Average Annual Salary: $95,000

3. Museum Educator/Curator - A person who works in a museum and helps visitors learn about fossils and Earth's history. They set up displays, answer questions, and create activities so people of all ages can explore and understand fossils and science. They make science fun and exciting for everyone!
Average Annual Salary: $45,000

## NGSS Connections

Performance Expectation: K-ESS3-1: Living things need water, air, and resources from the land, and they live in places that have the things they need

Disciplinary Core Ideas:
- K-ESS3.A - Living things need water, air, and resources from the land
- 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
- Scale, Proportion, and Quantity - Natural objects exist from very small to very large

## Science Vocabulary

* Fossil: The remains or print of a plant or animal that lived long ago
* Shell: The hard outer covering that protects some animals
* Ancient: Something that is very, very old
* Preserved: Kept safe and protected for a long time
* Evidence: Clues that help us learn about something
* Pattern: Shapes or designs that repeat or have order

## External Resources

Children's Books:
- Fossils Tell of Long Ago by Aliki
- If You Find a Rock by Peggy Christian
- Digging Up Dinosaurs by Aliki