# Fossil in Sedimentary Rock

Earth & Space Science | Lesson Guide

1st Grade

## Photo Description

These rocks have shapes of old sea animals inside them. The shapes look like shells that lived in the ocean long, long ago. These special rocks are called fossils.

## Scientific Phenomena

The Anchoring Phenomenon is fossil formation through sedimentary processes. These fossils show ancient marine organisms (likely brachiopods and crinoids) that were buried in sediment millions of years ago. Over time, the soft parts decomposed while the hard shells and skeletal structures were preserved as the sediment turned to rock. This process demonstrates how Earth's materials change over very long periods of time and provides evidence of past life.

## Core Science Concepts

1. Fossils as Evidence of Past Life - Fossils are remains or traces of plants and animals that lived long ago, preserved in rock
2. Rock Formation - Sedimentary rocks form when layers of sand, mud, and other materials pile up and harden over time
3. Deep Time - Earth is very old, and these changes happen over millions of years
4. Observation Skills - Scientists study fossils by looking carefully at their shapes, patterns, and features

**Pedagogical Tip:**

Use real fossils or high-quality replicas for hands-on exploration. First graders learn best through tactile experiences, and feeling the texture and weight of fossils makes the concept more concrete than pictures alone.

**UDL Suggestions:**

Provide multiple ways to explore fossils: visual (magnifying glasses), tactile (handling specimens), and kinesthetic (making clay impressions). Create fossil rubbings with paper and crayons to support students who learn better through art-based activities.

## Zoom In / Zoom Out

1. Zoom In: At the microscopic level, mineral crystals slowly replace the original shell material molecule by molecule, preserving the detailed structure of the ancient organism while turning it to stone.

2. Zoom Out: These marine fossils are part of Earth's rock layers that tell the story of ancient oceans, climate changes, and the evolution of life across our entire planet over millions of years.

## Discussion Questions

1. What do you notice about the shapes in these rocks? (Bloom's: Remember | DOK: 1)
2. How do you think these shell shapes got inside the rocks? (Bloom's: Analyze | DOK: 2)
3. What can these fossils tell us about what Earth was like long ago? (Bloom's: Evaluate | DOK: 3)
4. If you found a fossil, what would you want to learn about it? (Bloom's: Create | DOK: 2)

## Potential Student Misconceptions

1. Misconception: Fossils are just regular rocks that look like animals
   Clarification: Fossils were once real living things that got preserved in rock over millions of years

2. Misconception: All fossils are dinosaur bones
   Clarification: Fossils can be from many different plants and animals, including sea creatures, insects, and plants

3. Misconception: Fossils formed quickly, like in a few days
   Clarification: Fossil formation takes millions of years through very slow processes

## Cross-Curricular Ideas

1. Math + Science: Count and compare the number of fossils in a collection. Measure fossils using non-standard units (blocks, paperclips) to explore size and measurement concepts while observing different fossil shapes and patterns.

2. ELA + Science: Read "Fossils Tell of Long Ago" by Aliki and have students draw pictures of ancient sea animals. Students can dictate or write simple sentences like "The fossil shows a shell from long ago" to practice writing while learning fossil vocabulary.

3. Art + Science: Create fossil imprints using playdough or clay. Students press toy shells, leaves, or other objects into soft materials to make impressions, mimicking the natural fossil formation process in a hands-on, creative way.

4. Social Studies + Science: Discuss how people learn about Earth's history by studying fossils. Talk about paleontologists as scientists who are like detectives, solving mysteries about ancient life and helping us understand our planet's story over time.

## STEM Career Connection

1. Paleontologist - A scientist who digs up and studies fossils to learn about animals and plants that lived long, long ago. Paleontologists are like detectives who solve puzzles about Earth's past! Average Annual Salary: $65,000

2. Geologist - A scientist who studies rocks and Earth materials, including how fossils form inside rocks over millions of years. Geologists help us understand what Earth was made of and how it changed over time. Average Annual Salary: $93,000

3. Museum Educator - A person who works in museums and helps visitors (like you!) learn about fossils and ancient life by showing real fossils and explaining their stories. They make science fun and exciting for everyone! Average Annual Salary: $38,000

## NGSS Connections

- Performance Expectation: 1-ESS1-1 - Use observations of the sun, moon, and stars to describe patterns that can be predicted

- Disciplinary Core Idea: K-ESS2.D - Things that people do to live comfortably can affect the world around them
- Crosscutting Concept: Patterns - Patterns in the natural world can be observed and used as evidence

## Science Vocabulary

* Fossil: The remains or shape of a plant or animal that lived long ago, saved in rock
* Ancient: Something that is very, very old from long ago
* Preserve: To keep something safe so it lasts a long time
* Sediment: Tiny pieces of rock, sand, and mud that settle in layers
* Shell: The hard outer covering that protects some sea animals

## 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