Fossil in Sedimentary Rock

Earth & Space Science | Lesson Guide

Kindergarten

Photo Description

The picture shows old rocks with special shapes inside them. Some rocks have shells and spiral shapes that look like snails. These shapes are called fossils and they are very, very old.

Scientific Phenomena

This image represents the Anchoring Phenomenon of fossil formation and preservation. Fossils form when living things like sea animals die and get buried quickly by sand or mud. Over millions of years, the soft parts disappear but the hard shells turn into rock. The spiral shapes we see are ancient sea creatures called ammonites that lived in the ocean long before dinosaurs. This process shows us what life was like on Earth a very long time ago.

Core Science Concepts

1. Fossils are evidence of past life - These rock shapes show us that different animals lived on Earth long ago
2. Earth changes over time - The rocks formed underwater but are now found on land, showing Earth's surface changes
3. Preservation process - Hard parts of animals (shells, bones) can turn into rock over very long periods
4. Scientific observation - We can learn about the past by carefully looking at and studying fossils

Pedagogical Tip:

Use concrete, hands-on materials like Play-Doh to press shells or toys into "sediment" to help kindergarteners understand how fossils form. This tactile experience makes the abstract concept more accessible.

UDL Suggestions:

Provide multiple ways to explore fossils: real specimens to touch, large picture books to see details, and simple songs or chants about "long, long ago" to support different learning styles and abilities.

Zoom In / Zoom Out

1. Zoom In: At the tiny level, minerals slowly replace the original shell material molecule by molecule, creating a rock copy of the original animal. Special chemicals in the ground help preserve the exact shape and details.

2. Zoom Out: These fossils are part of Earth's history book, helping scientists understand how oceans covered different parts of our planet millions of years ago and how life on Earth has changed over time.

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 does finding ocean animal fossils on land tell us about how Earth has changed? (Bloom's: Evaluate | DOK: 3)
4. If you found a fossil, what questions would you want to ask about it? (Bloom's: Create | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Fossils are just pretty rocks that formed naturally"
   Clarification: Fossils are evidence of real animals that once lived and died, not random rock formations

2. Misconception: "These animals lived when dinosaurs were alive"
   Clarification: Many fossils like these ammonites are much older than dinosaurs and lived in ancient oceans

3. Misconception: "Fossils form quickly like when we make handprints in clay"
   Clarification: Fossil formation takes millions of years, much longer than a human lifetime

Cross-Curricular Ideas

1. Math - Patterns and Sorting: Have students sort fossil pictures by shape (spiral vs. straight), size (big vs. small), or color (light vs. dark). Count how many spiral fossils you can find in the photo. This builds pattern recognition and basic sorting skills.

2. ELA - Storytelling and Writing: Read "Fossils Tell of Long Ago" by Aliki, then have students dictate or draw stories about what they imagine the ancient sea animals were doing before they became fossils. Create a classroom "fossil discovery journal" where students draw and label what they observe.

3. Social Studies - Then and Now: Discuss how Earth looked millions of years ago when these animals lived (oceans covered different places, different weather, different animals). Compare it to where we live today. This helps develop understanding of how places and environments change over time.

4. Art - Nature Rubbings and Clay Fossils: Have students make fossil rubbings by placing paper over fossil pictures and rubbing with crayons. Then provide air-dry clay for students to press shells, leaves, or plastic molds into to create their own "fossils," reinforcing the formation process through creative hands-on experience.

STEM Career Connection

1. Paleontologist - A scientist who digs up and studies fossils to learn about animals and plants that lived a very, very long time ago. Paleontologists are like detectives who solve mysteries about Earth's history by carefully examining rocks and bones. Average Annual Salary: $63,000 USD

2. Geologist - A scientist who studies rocks, minerals, and how Earth changes over time. Geologists examine fossils and rocks to understand Earth's story and help us find useful materials like coal and metals. Average Annual Salary: $94,000 USD

3. Museum Curator/Educator - A person who takes care of fossils and other special objects in museums and teaches visitors (like you!) about them. They clean, organize, and display fossils so everyone can learn about ancient life. Average Annual Salary: $58,000 USD

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 (Natural resources and how they are used)
- Crosscutting Concepts: Patterns (recognizing patterns in fossil shapes and formations)

Science Vocabulary

* Fossil: The remains or traces of plants and animals that lived long ago, now turned to rock
* Ancient: Something that is very, very old from long ago
* Preserve: To keep something safe and unchanged for a long time
* Evidence: Clues that help us learn about something we cannot see directly
* Spiral: A curved line that goes around and around, getting bigger or smaller

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