

Photo Description



This picture shows old fossils and rocks found on a beach or riverbank. The fossils are hard, stone-like shells from sea animals that lived long, long ago. You can see the shell patterns and spiral shapes that got trapped in rock over millions of years.

Scientific Phenomena

The anchoring phenomenon here is fossilization - the process by which ancient organisms become preserved in rock over extremely long periods of time. This occurs when organisms (like the marine animals visible in these shell fossils) die and become buried in sediment. Over millions of years, minerals replace the organic material while preserving the original shape and structure. The fossils in this image likely formed in ancient ocean environments, then were exposed through weathering and erosion, allowing us to discover them today.

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 layers.
2. Deep Time: The Earth is very old (billions of years), and these fossils formed millions of years before humans existed.
3. Environmental Change: The presence of sea creature fossils on land shows that environments change dramatically over time - areas that are now dry land were once covered by oceans.
4. Preservation Process: Hard parts like shells and bones are more likely to become fossils than soft parts because they resist decay better.

Pedagogical Tip:

Use concrete comparisons to help students grasp deep time. For example: "If Earth's history was one year, humans would only appear in the last few minutes of December 31st!"

UDL Suggestions:

Provide multiple ways for students to explore fossils: real specimens to touch, fossil rubbings with paper and crayons, and digital fossil collections they can zoom into on tablets to accommodate different learning preferences and physical abilities.

Zoom In / Zoom Out

1. Zoom In: At the microscopic level, minerals slowly replace the calcium carbonate in shells, crystal by crystal, preserving tiny details of the original organism's structure while turning it to stone.

2. Zoom Out: These fossils are part of Earth's rock record that tells the story of how our planet's climate, geography, and life forms have changed over billions of years, helping scientists understand past mass extinctions and environmental shifts.

Discussion Questions

1. What do you think these animals looked like when they were alive millions of years ago? (Bloom's: Create | DOK: 3)
2. How do you think these sea animal fossils ended up on dry land? (Bloom's: Analyze | DOK: 2)
3. What does finding these fossils tell us about what this place was like long ago? (Bloom's: Evaluate | DOK: 3)
4. Why do you think we find more shell fossils than fossils of soft animal parts like jellyfish? (Bloom's: Analyze | DOK: 2)

Potential Student Misconceptions

1. Misconception: "Fossils are just old rocks that look like animals."

Clarification: Fossils were once real, living animals that became preserved in rock over millions of years.

2. Misconception: "All dead animals become fossils."

Clarification: Fossilization is very rare and requires special conditions like being buried quickly in sediment.

3. Misconception: "Fossils formed recently, maybe hundreds of years ago."

Clarification: Most fossils are millions of years old - much older than humans have existed.

Cross-Curricular Ideas

1. Math - Measuring & Comparing: Have students measure different fossils with rulers or string, then create a simple bar graph or picture graph showing which fossils are longest or shortest. This builds measurement skills while exploring real objects.

2. ELA - Storytelling & Writing: Students can write or dictate short stories imagining what life was like for the sea animals that became fossils. Prompt them with sentence starters like "Long ago, a shell animal lived in the ocean. It..." to support emergent writers.

3. Social Studies - Then & Now: Create a simple map or drawing showing the same location "then" (when it was underwater with sea animals) and "now" (where we find the fossils on land). This helps students understand how places change over time.

4. Art - Fossil Rubbings & Sculptures: Students can make fossil rubbings using paper and crayons over real fossils or fossil replicas, or create their own "fossils" by pressing shells and objects into clay to make imprints - combining art with hands-on understanding of how fossils form.

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 the ancient animals looked like and how they lived.

Average Annual Salary: \$65,000 - \$75,000

2. Geologist - A scientist who studies rocks, minerals, and Earth's layers to understand how our planet formed and changed over time. Geologists often find and study fossils to learn the history of different places on Earth. Average Annual Salary: \$85,000 - \$95,000

3. Museum Educator or Curator - A person who works in natural history museums, displaying fossils and teaching visitors (like you!) about ancient life. They organize fossil collections, create exhibits, and help people understand what fossils tell us about Earth's past. Average Annual Salary: \$45,000 - \$60,000

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

- * Fossil: The remains or traces of plants and animals that lived long ago, preserved in rock.
- * Ancient: Something that is very, very old, from long before people lived on Earth.
- * Preserved: Kept safe and unchanged over a very long time.
- * Sediment: Tiny pieces of rock, sand, and mud that settle in layers.
- * Marine: Having to do with the ocean or sea.
- * Spiral: A shape that curves 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