

Visible Elements in Photo



- Multiple fossilized shells (ammonites and bivalves) embedded in sedimentary rock
- Tan, beige, and brown coloring indicating age and mineralization
- Spiral chamber structure visible in the center ammonite fossil
- Ridged texture on shell surfaces showing fine detail preservation
- Rocks of varying sizes clustered together in natural arrangement

Reasonable Inferences

- From shell structure & rock embedding: These organisms died, were buried under sediment, and hardened over time—the delicate spiral and ridges were preserved because they were protected from damage during fossilization.
- From texture detail preservation: Soft sediment (like mud or silt) was essential to capture fine surface patterns; harder sediment would have destroyed these details.
- From mixed fossil grouping: These organisms likely lived together in the same ancient environment (an ocean or shallow sea), suggesting they occupied the same habitat and time period.

Engineering Task

K-2 Challenge:

You found some ancient shells buried in the ground! Design a safe "fossil museum box" using a shoe box and clay. Your job: create a cozy nest of clay and sand that protects the shells and shows them off so visitors can see the pretty spiral patterns. The shells must not roll around or break.

3-5 Challenge:

Design a protective storage and display system for fragile fossils. Your container must:

- Protect shells from rolling or shifting during transport (use clay, sand, or foam)
- Keep the spiral and ridged details visible and dust-free
- Hold at least 3 different-sized "fossils" (shells or shell-like objects)
- Be labeled to explain what each fossil is and where it came from

Test your design by gently tilting the container side-to-side. All fossils must stay in place with zero damage to surface details.

EDP Phase Targeted

Ask / Define Problem

This photo shows preserved fossils, not a problem to solve yet. The task flips the problem: "How do we keep them preserved and protected now?" Students start by observing what made these fossils last millions of years (gentle embedding in soft material) and apply that insight to a modern storage challenge. This grounds the EDP in real paleontology practice.

Suggested Materials

- Shoe boxes or small plastic containers
- Air-dry clay or modeling clay
- Sand, fine gravel, or kinetic sand
- Shells (from beaches or craft stores) as fossil stand-ins
- Foam sheets or bubble wrap (for cushioning layers)
- Labels and markers (for identification)

Estimated Time

- 45–60 minutes (single session)
- Observation & discussion: 10 minutes
 - Design planning (sketch): 5 minutes
 - Building/arranging: 20–25 minutes
 - Testing & refinement: 10 minutes

Why This Works for Teachers

This task directly addresses NGSS ETS1.A (Defining and Delimiting Engineering Problems) by asking students to identify constraints (fragility, size variation, visibility) and criteria (protection + display) based on observable evidence, building design thinking rooted in authentic paleontological practice.