

Visible Elements in Photo



- White ibises (7 birds visible) with long, curved red-orange beaks
- Shallow water (muddy, shallow wetland environment)
- Muddy substrate with exposed soil and water channels
- Long, thin red legs adapted for wading
- Birds in various postures: standing, bent forward (feeding position), walking

Reasonable Inferences

1. From curved beaks + muddy substrate: Ibises probe into soft mud to find food (invertebrates, small fish); their beak shape is specialized for this hunting method.
2. From shallow water + leg length: Birds need water shallow enough to wade safely while maintaining balance and reaching the substrate.
3. From group behavior: Ibises forage communally, suggesting they require accessible, food-rich wetland areas that support multiple birds without competition for space.

Engineering Task

K-2 Challenge:

Design and build a shallow "mud dish" where toy birds can feed. Use a shallow container filled with sand or mud, add a little water, and place it where your toy birds can reach the "food" (small pebbles or beads buried in the mud). Test: Can your bird's beak (a stick or craft probe) pick up the hidden food? Make it better so the bird can find more food!

3-5: Design a Wetland Probe Tool

White ibises use their curved beaks to probe into soft mud without getting stuck. Your challenge: design and build a probe tool (like an ibis beak) that can:

- Push into soft mud at least 3 inches deep without breaking
- Retrieve a small object (bead or pebble) buried in the mud
- Remain stable when inserted at a 45-degree angle
- Be reusable for at least 10 successful probes

Test your prototype in a container of sand/mud mixture. Measure success by counting how many objects you can retrieve without the tool breaking or bending permanently. Refine the shape, material thickness, or angle if needed.

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EDP Phase Targeted

Ask / Define Problem

This photo documents a real animal solving a feeding problem in a specific habitat. Students should start by observing: What problem do ibises face when hunting? What features of their body help them solve it? This observation-based inquiry naturally leads to replicating the beak function—the core engineering challenge. The problem is already defined by nature; students just need to articulate it and prototype a solution.

Suggested Materials

- Shallow containers or trays
- Sand, soil, or kinetic sand
- Straws, dowels, or wooden skewers (to test as "beaks")
- Craft wire or foam tubing (bendable materials to simulate curved beak)
- Small objects to hide/retrieve: beads, pebbles, or dried beans
- Plastic spoons or craft sticks
- Water for shallow wetland simulation

Estimated Time

- K-2: 30–40 minutes (one session: observation + building + testing)
- 3-5: 60–90 minutes (two sessions: design planning + prototype building + testing + refinement)

Why This Works for Teachers

This task addresses NGSS ETS1.A: Defining and Delimiting Engineering Problems by having students observe how an organism's body structure solves a real-world feeding challenge, then prototype a human-made tool that mimics that biological solution—bridging life science observation and engineering design.