

Visible Elements in Photo



- One owl with mottled gray-brown plumage perched on a light-colored brick or concrete wall
- Textured white/cream-colored brick or stone surface with visible mortar lines and surface variation
- Owl's ear tufts (horns) clearly visible at the crown of head
- Owl's patterned feathers showing intricate dark and light markings
- Curved metal rim (bucket or container edge) in lower left corner of frame

Reasonable Inferences

- From mottled plumage + light wall: The owl's coloring matches the brick surface, suggesting camouflage is a survival strategy. The owl blends in with its resting environment to avoid predators or hide from prey.
- From textured wall surface + owl's position: Owls need rough, irregular surfaces with crevices to rest safely during daylight. The mortar lines and brick texture provide grip and concealment.
- From ear tufts + forward-facing eyes: This predator hunts at night and relies on hearing and vision; any shelter design must allow the owl to remain alert while hidden.

Engineering Task

K-2 Challenge:

Design and build a hiding spot for a toy owl using blocks, boxes, or clay. Your hiding spot should:

- Be big enough for the owl to fit inside
- Have a small opening so the owl can peek out and watch for danger
- Be made from materials that look like tree bark or rocks so it blends in

Teacher script: "Owls rest during the day in places where they can hide from other animals. Can you make a safe, secret spot where an owl could sleep?"

3-5 Challenge:

Design a wall-mounted roost shelter for a small owl that maximizes concealment while allowing the bird to remain alert. Your design must meet these criteria:

Constraints:

- Use only natural or recycled materials (bark, twigs, moss, cardboard, paper)
- Roost opening must face forward (no top-only entrances)
- Shelter footprint cannot exceed 20 cm × 15 cm
- Structure must support a 200g mass (simulated owl) for at least 2 minutes without tipping or collapsing

Success Criteria:

- Surface texture and color blend with a light brick or concrete wall within arm's reach
- At least 3 distinct materials used
- The roost conceals 80% or more of the mass when viewed from 1 meter away
- Structure can be mounted and removed without permanent damage

Challenge variation: Test multiple camouflage patterns. Which color combination makes your roost hardest to spot?

EDP Phase Targeted

Ask / Define Problem

This photo shows a real animal in its natural behavior (resting on a textured surface), which makes Ask the ideal starting point. Students first observe what owls actually need—concealment, a textured surface to grip, protection from view—before they design a solution. The owl's camouflage becomes the problem to solve ("How can we help an owl hide?") rather than a pre-designed answer. This grounds the challenge in authentic animal ecology rather than jumping straight to building.

Suggested Materials

1. Bark pieces, twigs, and moss (collected outdoors or purchased from craft suppliers)
2. Crumpled brown/gray paper, newspaper, or paper bags (for layering and texture)
3. Cardboard tubes, egg cartons, or corrugated cardboard scraps (for frame structure)
4. Natural clay or air-dry clay (to bind materials and model surface)
5. Sandpaper or craft cork sheets (to simulate rough tree bark texture)
6. String or hot glue (for assembly; supervise hot glue with younger students)

Estimated Time

- K–2: 2 sessions of 30–40 minutes each (building + play/observation)
- 3–5: 2–3 sessions of 45–50 minutes each (design sketch + building + testing/refinement)

Why This Works for Teachers

This task directly addresses NGSS ETS1.B: Developing Possible Solutions by asking students to design structures that meet multiple constraints (camouflage, stability, size), while ETS1.A: Defining Problems grounds the design in real animal needs observed in nature—turning a wildlife photograph into an authentic engineering problem.