Alligator Predator

Life Science | Engineering Design Process

Engineering Challenge

Visible Elements in Photo

- A shallow body of water (light green/murky) covering most of the frame
- A dark, textured log or submerged object running horizontally across the center
- Sparse aquatic vegetation (thin shoots and small plants) scattered across the water surface
- Small debris and organic matter floating or settled on the water bottom
- Uneven terrain visible beneath the water (shallow in some spots, deeper in others)

Reasonable Inferences

- From the log-like object and sparse vegetation: This is a natural wetland or swamp environment where predators may hide among minimal cover. An animal relying on camouflage or stealth would need to stay concealed while hunting or avoiding detection.
- From the shallow, murky water and scattered plants: The water offers limited visibility, which creates a challenge for any creature trying to navigate, find food, or avoid predators in this habitat.
- From the overall terrain: Small animals living here would need shelter or cover from larger predators in a space with few obvious hiding spots.

Engineering Task

K-2 Challenge:

"Design a hiding spot for a small swamp animal (like a frog or turtle) in a shallow water habitat. Your shelter should use natural materials and let the animal stay hidden from bigger animals that hunt it. Test it by seeing if a partner can spot your hiding spot from across the room."

3-5 Challenge:

"Design a camouflaged shelter for a wetland creature (such as a crayfish or water snake) that must fit entirely within a 12-inch × 8-inch shallow water zone. Your design must:
- Use only natural or recycled materials (sticks, leaves, mud, string, fabric scraps).
- Keep the creature hidden from view when submerged or partially submerged.
- Remain stable for at least 2 minutes when water is gently disturbed.
- Allow a small opening for the animal to enter and exit.

Test your design in a shallow pan of water and refine it based on what you observe."

EDP Phase Targeted

Ask / Define Problem

This photo shows a real-world habitat with a visible challenge: a creature living in this environment must find ways to hide and survive in low-visibility water with sparse natural cover. Students begin by observing the habitat and identifying what an animal living here would need—a classic problem-definition moment. The photo doesn't show a solution; it shows the need, making "Ask" the natural starting point.

Suggested Materials

- Sticks and twigs
- Dried leaves or aquatic plants
- Mud or clay
- Recycled fabric scraps or burlap
- String or raffia
- Shallow plastic containers or aluminum pans (for testing tanks)
- Water

Estimated Time

K-2: 40–50 minutes (20 min. observation & planning, 20–25 min. building, 5–10 min. testing and sharing)

3-5: Two 35–40 minute sessions (Session 1: observation, constraint review, and initial design sketch; Session 2: building, testing in water, and refinement)

Why This Works for Teachers

This task directly addresses NGSS ETS1.A (defining and delimiting engineering problems by identifying criteria for success and constraints), while grounding the challenge in observable habitat characteristics that make the need for camouflage and shelter concrete and personally relevant to students.