

Visible Elements in Photo



- A dragonfly (with transparent wings, segmented blue-green body, and large compound eyes) perched on a rough, weathered wooden or concrete edge
- A textured, gray surface with visible cracks and ridges
- Clear detail of the insect's grip and body position on the angled surface
- Blurred background suggesting an outdoor environment

Reasonable Inferences

- From the dragonfly's perch location: The insect requires a landing surface that provides grip and stability despite being a fast, aerial flier—suggesting landing spots are not random but need specific surface properties.
- From the textured surface: The rough, irregular texture of the perch likely helps the dragonfly's legs grip more easily than a smooth surface would.
- From outdoor context: Dragonflies hunt insects near water and need reliable resting spots between flights, implying a shelter or landing structure must account for natural behavior patterns.

Engineering Task

K-2 Challenge:

Design a safe resting spot where a dragonfly (or toy dragonfly) can land and stay still. Use natural materials like twigs, bark, and leaves to create a bumpy, grippy surface. Test it by gently placing a toy bug on it. Does it stay? Can you make it stickier or grippier?

3-5 Challenge:

Engineer a landing perch for dragonflies using only natural and recycled materials. Your structure must:

- Be at least 15 cm tall and positioned at a 30–45° angle
- Have a textured surface with at least 3 different grip-enhancing features (bark, rough fabric, ridges)
- Support a 5-gram weight (washer or small stone) without sliding for 10 seconds
- Be placed within 1 meter of a water source (real or simulated)

Test your design by placing the weight on the perch at different angles and record which materials grip best. Redesign using your findings.

EDP Phase Targeted

Ask / Define Problem

This phase fits because the photo shows a real organism solving a real problem—how to perch reliably on natural surfaces. Students observe the dragonfly's actual choice of landing spot and infer the need (stable grip, secure rest between flights). This observation-to-problem framing is authentic and motivates the design work that follows.

Suggested Materials

- Small twigs, bark strips, or fallen branches
- Burlap, textured fabric, or sandpaper
- Recycled cork or foam padding
- Small weights (washers, stones, or paper clips)
- Tape, glue, or rubber bands for assembly

Estimated Time

One 45-minute session (K-2) or two 40-minute sessions (3-5)

For grades 3–5, split across two days: Day 1 for build and initial testing; Day 2 for observation, data recording, and redesign.

Why This Works for Teachers

This task directly addresses NGSS ETS1.A (defining and delimiting engineering problems) by grounding the challenge in observable animal behavior, making the "need for a solution" tangible and student-driven rather than teacher-imposed.