

### Visible Elements in Photo



- A lizard (appears to be an anole or similar species) with gray and tan coloring on its head and body
- A bright red and yellow dewlap (throat fan) extended below the chin
- Rough, dry bark or wood branch the lizard is perched on
- Sandy/rocky ground visible in the blurred background
- Small pebbles and scattered woody debris in the habitat

### Reasonable Inferences

- From the extended red dewlap: The lizard uses bright colors to signal or communicate with other lizards; a design must account for visibility and movement in a habitat with neutral tones.
- From the rough bark perch: The lizard needs textured surfaces for grip and climbing; smooth surfaces would be inadequate.
- From sandy ground and rocky background: The lizard's natural habitat includes loose materials and stones that provide shelter, camouflage, and temperature regulation.

### Engineering Task

#### K-2 Challenge:

Design a cozy home for a lizard using sticks, rocks, and sand. Your lizard needs a hiding spot where it can rest, a branch to climb on, and a sunny spot to warm up. Test your design: Can your toy lizard fit inside? Can it climb the branch? Does it have shade?

#### 3-5 Challenge:

Design and build a terrarium enclosure for a display lizard that meets these criteria:

- Must include at least two different textured surfaces (bark, stone, sand) so the lizard can climb and hide.
- Must provide a shaded shelter area (using natural or craft materials) that is at least 5 cm deep.
- Must include an open basking area with clear visibility (to simulate the lizard's communication behavior).
- The structure must be stable enough to hold a 50g weight (representing the lizard) without tipping.
- Test it: Does water drain properly? Can you easily observe the lizard from one side?

### EDP Phase Targeted

Ask / Define Problem

Why this phase fits: The photo shows a living creature in its natural habitat—a real-world context where students can identify actual needs (shelter, climbing surfaces, temperature regulation, visibility for mating displays). This phase invites students to ask: "What does this lizard need to survive and thrive?" before jumping to solutions. The visible behaviors and habitat structure prompt genuine inquiry rather than leading students toward a pre-determined answer.

### Suggested Materials

- Branches, twigs, or bark pieces (from outdoors or craft suppliers)
- Sand or sandy soil
- Small rocks and pebbles
- Cardboard tubes or paper cups (for shelter)
- Tape, glue, or hot glue gun
- Shallow container or cardboard box (as the enclosure base)
- A toy lizard or model (for testing, if live animals aren't available)

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### Estimated Time

Two 30-minute sessions (or one 60-minute session with breaks)

- Session 1: Planning, gathering materials, initial building (20–30 min)
- Session 2: Testing, observing, and refining the design (25–35 min)

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### Why This Works for Teachers

This task directly addresses NGSS 3-5-ETS1-1 (Define a design problem that can be solved by applying scientific ideas about animals, plants, structures, and/or processes) by grounding engineering in observable animal behavior and habitat needs, making the challenge meaningful and rooted in real science.