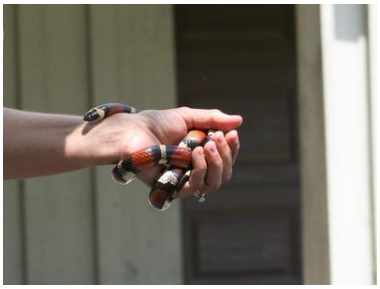
King Snake

Life Science | Engineering Design Process

Engineering Challenge

Visible Elements in Photo



- A coral snake (red, black, and white/yellow banded pattern) coiled on a child's open hand
- Child's bare hand (palm up, fingers relaxed)
- Indoor background with neutral-colored walls and doorway
- Snake's body curved and resting across the palm and fingers
- Snake's head visible at the top of the coil

Reasonable Inferences

- From snake's position on hand: The snake is small enough to be safely held and observed by a child, suggesting it is a juvenile or a non-venomous species (coral snake mimic). This implies handlers need containment structures that prevent escape while allowing observation.
- From relaxed hand posture: The snake is calm and accustomed to handling, which means any design for a temporary viewing or handling enclosure must minimize stress (smooth surfaces, secure but not restrictive).
- From banded coloration: The snake's pattern provides camouflage in natural environments with similar striped vegetation or rocky terrain, suggesting a habitat design should include visual cover.

Engineering Task

K-2 Challenge:

Design a safe, cozy "snake home" using paper towel tubes, fabric scraps, and a small box. Your snake home needs:
- A place for the snake to hide and feel safe
- Openings that let you see the snake without it escaping
- Soft materials so the snake doesn't get hurt

3-5 Challenge:

Design a temporary observation enclosure for a small snake that meets these criteria:
- Dimensions: 12" × 8" × 6" (length × width × height)
- Must include at least 2 shelter spaces made from natural or recycled materials (cork bark, paper tubes, fabric)
- Must have transparent viewing panels on at least 2 sides so observers can see the snake without disturbing it
- Must be escape-proof: test by placing the snake inside for 5 minutes with no exits
- Must be easy to clean and disassemble in under 3 minutes

EDP Phase Targeted

Ask / Define Problem

This photo shows a living creature in human hands with no permanent structure around it. The natural question is: "How can we safely house and observe this animal without stressing it or letting it escape?" This is a real-world need observation, making Ask / Define Problem the strongest entry point. Students must first understand what a snake needs (shelter, safety, visibility) before designing anything.

Suggested Materials

- Paper towel tubes or toilet paper tubes
- Cardboard boxes (small gift boxes or repurposed packaging)
- Fabric scraps, felt, or soft cloth
- Clear plastic wrap or plastic report covers (for viewing panels)
- Cork bark pieces or moss (optional, for natural feel)
- Duct tape or masking tape for assembly
- Newspaper or paper for lining the base

Estimated Time

- K-2: 45–60 minutes (one session with teacher guidance)
- 3-5: 60–90 minutes (planning sketch + building + testing, may extend to two 45-minute sessions)

Why This Works for Teachers

This task directly addresses NGSS ETS1.A (defining and delimiting engineering problems) and ETS1.B (developing possible solutions) by asking students to identify the needs of a living organism and design a functional structure that balances safety, usability, and the animal's welfare—a meaningful real-world constraint that goes beyond abstract building.