

Visible Elements in Photo



- A centipede with a segmented body (approximately 15+ segments visible)
- Reddish-brown exoskeleton with a glossy appearance
- Multiple pairs of legs extending from each body segment
- Rough, textured wooden surface (the centipede's habitat)
- Small debris and lichen patches on the wood

Reasonable Inferences

- From segmented body structure: The centipede's flexible, jointed design allows it to move through tight spaces and uneven terrain on the forest floor.
- From multiple leg pairs: Each segment contributes legs for coordinated, wave-like movement across surfaces—an adaptation for crawling efficiently through soil and wood crevices.
- From habitat (wood surface): Centipedes hunt in decomposing wood and soil, suggesting their body shape is optimized for navigating narrow, confined spaces.

Engineering Task

K-2 Challenge:

"Design a Wiggly Crawler"

Build a creature that can move like a centipede by wiggling and bending. Use paper segments connected together so it can squeeze through a narrow tunnel made from a paper towel tube. Your crawler should have at least 6 body parts that can bend and move. Can your creature make it all the way through the tunnel without getting stuck?

3-5 Challenge:

"Engineer a Segmented Robot Crawler"

Design and build a segmented crawler inspired by centipede movement. Your design must:

- Have at least 8 body segments, each one independently movable
- Use legs or appendages on at least 4 segments
- Successfully navigate through a course with three obstacles: a narrow gap (2 inches wide), a ramp angled 30°, and uneven "terrain" (crumpled paper)
- Complete the course in under 45 seconds without falling apart

Measure and record the time it takes to complete the course. Identify which segment design works best for turning corners.

EDP Phase Targeted

Ask / Define Problem

This phase fits best because the photo shows an animal in nature solving a real movement problem—navigating confined, uneven spaces. Students begin by observing how the centipede's segmented structure solves the challenge of flexibility and efficiency, then translate that observation into their own design brief.

Suggested Materials

- Paper cups, straws, or foam tubes (for body segments)
- Pipe cleaners or craft sticks (for legs)
- Tape, glue, or brass fasteners (for flexible joints)
- Markers and colored paper (for decoration and labeling)
- Stopwatch or timer (for 3–5 testing phase)

Estimated Time

- K–2: 45–60 minutes (single session: design, build, test)
- 3–5: Two 40-minute sessions (Session 1: design and build; Session 2: test, measure, refine, document results)

Why This Works for Teachers

This task directly addresses NGSS ETS1.A (Defining and Delimiting Problems) and ETS1.B (Developing Possible Solutions) by having students observe a natural structure, identify the engineering problem it solves, and prototype their own solution based on observable design features.