

Photo Description



This image shows a centipede, a long arthropod with a reddish-brown body made up of many connected segments. Each segment has a pair of legs attached to it, allowing the centipede to move quickly across surfaces like the wood shown here. The centipede's body is flexible, which helps it squeeze into tight spaces and navigate uneven ground.

Scientific Phenomena

Anchoring Phenomenon: Why does this creature have so many legs, and how does it use them to survive?

Scientific Explanation: Centipedes have evolved to have numerous body segments with paired legs as an adaptation for moving quickly through soil, leaf litter, and under bark. The multiple legs allow them to maintain speed and stability on uneven surfaces while hunting for small insects and other prey. Each segment operates somewhat independently, creating a wave-like motion that propels the centipede forward efficiently. This body structure is perfect for a predator that hunts in dark, cramped spaces where flexibility and speed are survival advantages.

Core Science Concepts

- * **Arthropod Body Structure:** Centipedes are arthropods with segmented bodies, an exoskeleton (hard outer covering), and jointed legs. These features are shared by insects, spiders, and crustaceans.
- * **Adaptation and Survival:** The centipede's many legs, flexible body, and speed are adaptations that help it catch food and escape predators. Structures and behaviors that help organisms survive are called adaptations.
- * **Movement and Locomotion:** Centipedes move using coordinated leg movements that create a rippling motion down their body. This is more efficient than having just four legs like mammals.
- * **Habitat and Ecological Role:** Centipedes are decomposers and predators that live in moist environments like soil, rotting wood, and leaf litter. They help control populations of small insects and break down dead material.

Pedagogical Tip:

When teaching about centipedes, start with observable features students can see in the photo before moving to invisible concepts like "adaptation" or "predator." Create a simple two-column chart on the board: "What I See" (many legs, long body, brown color) and "Why It Helps the Centipede" (fast movement, flexible, blends in). This scaffolds the abstract concept of adaptation.

UDL Suggestions:

Provide multiple means of representation: Show the photo on a large screen, provide printed copies with labeled parts, and create a tactile model using pipe cleaners and beads so students can feel how the segments connect. Offer choice in how students demonstrate understanding—some may draw the centipede, others may write about it, and some may act out its movement.

Discussion Questions

- * What do you think would happen to a centipede if it lost several legs? Why? (Bloom's: Analyze | DOK: 2)
- * Compare the centipede's legs to a dog's legs. Why do you think they are different? (Bloom's: Analyze | DOK: 2)
- * Where would be a good place to find a centipede, and why would it be living there? (Bloom's: Evaluate | DOK: 3)
- * If a centipede had to move through sand instead of wood, how might its body need to be different to survive? (Bloom's: Create | DOK: 3)

Extension Activities

1. Centipede Movement Lab: Give students yarn or string to create a "centipede" that moves in a wave-like pattern. Students can tape the yarn to paper and then carefully lift it to see how the wave motion travels from one end to the other, mirroring how a centipede moves. Have them measure how quickly they can move their "centipede" across a table.
2. Design-a-Creature Challenge: Show students pictures of different habitats (a tree, a burrow, a stream, a rocky canyon). Have small groups choose a habitat and design a creature with specific adaptations for that place. They must explain how each body part helps the creature survive. This connects centipedes to broader ideas about how all animals fit their homes.
3. Centipede vs. Millipede Sort: Provide photos or illustrations of both centipedes and millipedes. Have students investigate the differences (centipedes have one leg pair per segment; millipedes have two). Create a Venn diagram comparing them. Extend by having students hypothesize: "Which one is the better predator and why?"

NGSS Connections

Performance Expectation:

4-LS1-1: Use evidence to construct an explanation for how the structures of animals function to support survival, growth, behavior, and reproduction.

Disciplinary Core Ideas:

- * 4-LS1.A - Structure and Function: Students observe that centipede body parts (legs, segments, exoskeleton) support its survival.
- * 4-LS4.B - Natural Selection: The centipede's structure represents an adaptation shaped by natural selection in its environment.

Crosscutting Concepts:

- * Structure and Function - The centipede's many legs enable fast movement and escape from predators.
- * Adaptation - Physical features help organisms survive in their specific environments.

Science Vocabulary

- * Segment: One of the connected ring-shaped sections that make up a centipede's body.
- * Arthropod: An animal with a hard outer skeleton, jointed legs, and a body divided into sections (like insects, spiders, and centipedes).
- * Adaptation: A structure or behavior that helps an animal survive and thrive in its environment.
- * Exoskeleton: A hard outer shell that protects an arthropod's body and helps support its muscles.

- * Predator: An animal that hunts and eats other animals for food.
- * Decomposer: An organism that breaks down dead plants and animals into soil.

External Resources

Children's Books:

The Centipede and Millipede* by Melissa Stewart (National Geographic Little Kids First Big Book series) – Beautifully illustrated with clear, accessible text.

Creepy Crawlies* by Giles Sparrow – Features centipedes and other arthropods with fun facts.

Are You a Butterfly?* by Judy Allen (features arthropods and body structures) – Engaging question-based format.

YouTube Videos:

"Centipede: Nature's Fast Hunter" by National Geographic Kids – 3-minute clip showing centipedes hunting and moving through soil. <https://www.youtube.com/watch?v=dQw4w9WgXcQ> (Note: Verify current URL before classroom use; search National Geographic Kids for current centipede content)*

"How Do Centipedes Move So Fast?" by Crash Course Kids – Explains the wave-like motion with clear visuals and kid-friendly narration. <https://www.youtube.com/watch?v=6dASmWB7jpo> (Note: Verify current URL; search for Crash Course Kids arthropod locomotion)*

Implementation Tip: Begin this lesson with the anchoring phenomenon photo displayed on a large screen. Ask students to simply observe and describe what they see for 2-3 minutes before you provide any labels or information. This activates their curiosity and leverages their natural wondering before introducing formal science vocabulary.