

## Photo Description

This image shows a centipede on a brown, wooden surface. You can see its long, flat body with many pairs of legs running down each side. The centipede has a reddish-brown color and antennae (long feelers) on its head that help it sense its surroundings.



## Scientific Phenomena

Anchoring Phenomenon: Why does a centipede have so many legs?

Centipedes have many legs because each body segment (or ring) has one pair of legs attached to it. This body design helps centipedes move quickly through soil, leaf litter, and under logs to hunt for small insects and other creatures. The many legs work together like a wave, allowing the centipede to move in a smooth, fast motion—almost like it's flowing across the ground. This is an adaptation that has helped centipedes survive in nature for millions of years.

## Core Science Concepts

- \* Body Structure and Function: Centipedes have segmented bodies made of many rings. Each segment has legs, and the more legs working together, the faster and more efficiently the centipede can move.
- \* Adaptations for Survival: The centipede's many legs, antennae, and flattened body are special features that help it survive by moving quickly to catch food and hide from predators.
- \* Animal Classification: Centipedes are invertebrates (animals without backbones). They belong to their own group of animals, separate from insects, which have six legs.
- \* Habitat and Behavior: Centipedes live in dark, damp places like under logs, in soil, and in leaf piles where they hunt for food at night.

### Pedagogical Tip:

First graders learn best through observation and movement. Before showing this image, have students walk like different animals with different numbers of legs (2 legs like a human, 4 legs like a dog). Then introduce the centipede and ask: "What if you had to walk on 30 legs?" This kinesthetic connection makes the concept memorable and developmentally appropriate.

### UDL Suggestions:

**Multiple Means of Representation:** Provide both the photograph AND a large, labeled diagram of a centipede showing body segments and legs. Some students may need a tactile model (like a pipe cleaner with markers for legs) to understand the structure. Use consistent color-coding to show the repeating body segments.

**Multiple Means of Action & Expression:** Allow students to demonstrate understanding through drawing, acting out centipede movement, building a model with craft supplies, or verbally describing what they observe rather than requiring only written responses.

## Zoom In / Zoom Out

### Zoom In (Microscopic Level):

If we could shrink down and look at a centipede's legs under a microscope, we would see tiny joints and muscles that work together. Each leg has special muscles inside that pull and push to help the centipede walk. The antennae are covered with super-tiny sensors (smaller than a grain of sand!) that help the centipede "smell" and "feel" its surroundings even in complete darkness. These tiny body parts are so small you can't see them without a special magnifying tool, but they're what make the centipede such a great hunter!

### Zoom Out (Ecosystem Level):

A centipede is an important member of its forest or garden ecosystem. It eats small insects like ants, beetles, and worms, which helps control their populations. When a centipede dies, it becomes food and nutrients for the soil, plants, and other decomposers. Centipedes are also food for bigger animals like birds, lizards, and toads. Everything in the soil—from tiny bacteria to centipedes to plants to larger animals—works together in a connected web. If centipedes disappeared, there would be too many small insects, and the whole garden or forest ecosystem would get out of balance.

## Discussion Questions

1. Why do you think a centipede needs so many legs instead of just four like a dog? (Bloom's: Analyze | DOK: 2)
2. What do you observe about how a centipede's body is organized? (Bloom's: Remember | DOK: 1)
3. If a centipede lost three of its legs, do you think it could still move? Why or why not? (Bloom's: Evaluate | DOK: 3)
4. Where might you find a centipede in your backyard, and why would it want to live there? (Bloom's: Apply | DOK: 2)

## Potential Student Misconceptions

Misconception 1: "Centipedes have 100 legs because 'centi' means 100."

- Clarification: The word "centipede" does mean "hundred feet," but most centipedes actually have between 20 and 30 pairs of legs (40 to 60 legs total), not 100! The name comes from how many legs scientists thought they had a long time ago. Different kinds of centipedes have different numbers of legs, but rarely exactly 100.

Misconception 2: "Centipedes and millipedes are the same thing."

- Clarification: Centipedes and millipedes look similar but are different animals. Centipedes have one pair of legs on each body segment and they run fast to hunt for food. Millipedes have two pairs of legs on each body segment and they move slowly, eating dead leaves and plants instead of hunting. It's like how cats and dogs both have four legs, but they are different animals!

Misconception 3: "All the legs help a centipede in the same way."

- Clarification: While all of a centipede's legs help it move, the front legs are actually modified into special fangs called "poison claws" that help the centipede catch and hold its food. So not every leg does exactly the same job—some are for walking, and some are for hunting!

## Extension Activities

1. Centipede Movement Exploration: Create a "centipede" using a long piece of string or yarn and clothespins or paper clips to represent legs. Have students hold different parts and walk together, noticing how the "legs" must work in a coordinated wave pattern. Discuss why this helps real centipedes move so fast.

2. Build a Centipede Model: Provide students with craft materials (egg cartons, construction paper, pipe cleaners, or playdough rolled into balls). Have them create their own centipede model, counting and adding the correct number of legs. Display the models and compare different versions.

3. Habitat Hunt: Take students on a supervised nature walk or outdoor exploration to look under logs, rocks, and in mulch piles (without touching anything). Create a chart of where centipedes might live and what they need to survive (dark places, moisture, soil for digging, food sources).

### Cross-Curricular Ideas

Mathematics: Count the legs on the centipede in the photo and practice skip-counting by 2s (since legs come in pairs). Create a graph showing "How many legs do different animals have?" (centipede, ant, dog, human, spider). Have students sort pictures of animals by number of legs and find patterns.

English Language Arts: Read Many Legs by Jacklyn Williams or a similar picture book about centipedes, then have students dictate or write simple sentences about what they learned. Create a class "Centipede Fact Book" where each student contributes one page with a sentence and illustration. Practice descriptive words like "long," "fast," "many," and "creepy."

Art: Create centipede collages using painted egg cartons, construction paper strips, and pipe cleaners. Students can paint their centipedes different colors and add details like antennae and eyes. Display the artwork and discuss how real centipedes use their colors to blend in with their habitats (camouflage).

Social Studies/Community: Connect to "living things in our local environment" by creating a classroom "Bug Habitat Map" showing where different creatures (including centipedes) live in the schoolyard, garden, or nearby park. Discuss why we should respect and protect small animals and their homes rather than stepping on them or destroying their habitats.

### STEM Career Connection

Entomologist (Bug Scientist): An entomologist is a scientist who studies insects and other small creatures like centipedes. They observe animals, count their legs, learn what they eat, and discover new species. Some entomologists work in museums, universities, or nature centers teaching people about bugs. Average Annual Salary: \$65,000 USD

Soil Scientist: A soil scientist studies the dirt in gardens, forests, and farms. They learn about all the tiny creatures that live in soil—like centipedes, worms, and bacteria—and how these animals help plants grow. Soil scientists help farmers grow better crops and help protect forests. Average Annual Salary: \$68,000 USD

Nature Photographer: A nature photographer takes pictures of animals and plants in their habitats, like the centipede photo you see here! They use special cameras and equipment to capture amazing close-up images that teach people about wildlife. Nature photographers' work appears in books, websites, magazines, and nature documentaries. Average Annual Salary: \$55,000 USD

### NGSS Connections

Performance Expectation:

K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.

Disciplinary Core Ideas:

- K-LS1.A - All organisms have structures that serve different functions in growth, survival, and reproduction.

Crosscutting Concepts:

- Structure and Function - The shape and stability of structures of natural and designed objects are related to their function(s).
- Patterns - Patterns in the natural world can be observed, used to describe phenomena, and used as evidence.

### Science Vocabulary

- \* Centipede: A small animal with a long, flat body and many legs that lives in soil and dark places.
- \* Segment: One ring or section of an animal's body; a centipede's body is made of many segments joined together.
- \* Antenna (plural: antennae): Long, thin feelers on an animal's head that help it sense what is around it.
- \* Adaptation: A special body part or behavior that helps an animal survive in its home.
- \* Invertebrate: An animal that does not have a backbone inside its body.
- \* Predator: An animal that hunts and eats other animals for food.

### External Resources

#### Children's Books:

- National Geographic Little Kids First Big Book of Animals by National Geographic Kids (includes centipedes and other creatures)
- Are You a Butterfly? by Judy Allen and Tudor Humphries (introduces invertebrate body structures)
- Many Legs by Jacklyn Williams (focuses on arthropods with multiple legs)

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Teacher Tip: This lesson works especially well in spring when centipedes are more active. Pairing this with a sensory-rich observation activity ensures that all learners—visual, kinesthetic, and auditory—remain engaged with the phenomenon.