Orb Weaver

Life Science | Lesson Guide

5th Grade

Photo Description

This image shows a large spider with long, thin legs resting on a person's hand. The spider has a brown and tan body with distinctive markings, and its legs are spread wide apart. You can see the fine details of the spider's body, including its eyes and the tiny hairs covering its legs.

Scientific Phenomena

Anchoring Phenomenon: Why are spiders found in so many different environments, and how do they survive in the same spaces where humans live?

This spider (likely an orb-weaver) is being observed directly, demonstrating how humans can study organisms in their natural state. Spiders are successful predators found worldwide because they have adapted specialized body structures for hunting—their long legs help them move quickly, and their ability to produce silk allows them to build traps for catching insects. The spider remains calm on the human hand because it recognizes no immediate threat, showing that spiders are generally harmless unless threatened.

Core Science Concepts

* Structure and Function: Spiders have specialized body parts that help them survive. Their eight legs give them speed and balance, their multiple eyes help them detect movement, and their ability to produce silk from their abdomen enables them to build webs for catching food.

* Adaptation: Spiders are adapted to their environments through physical features (long legs, strong fangs) and behaviors (web-building, hunting strategies) that help them survive and find food.

* Biodiversity and Habitats: Spiders live in nearly every habitat on Earth—from gardens to forests to homes—because they have adaptations that allow them to thrive in different conditions.

* Life Cycles and Food Webs: Spiders are carnivorous predators that eat insects, making them important members of ecosystems. They help control insect populations while serving as food for birds, lizards, and other animals.

Pedagogical Tip:

When teaching about spiders, address students' potential fear or disgust by reframing spiders as beneficial hunters rather than "creepy" creatures. Use precise, scientific language and focus on their incredible adaptations. This normalizes fear and builds confidence in observing organisms objectively.

UDL Suggestions:

Provide multiple means of representation by offering both close-up images and videos of spiders in their natural habitats. Allow students to choose between drawing a spider diagram, creating a digital model, or building a 3D spider model with craft materials. For engagement, let students observe live spiders (non-threatening species) in a classroom terrarium, with the option to observe from a distance for students with arachnophobia.

Discussion Questions

1. What do you notice about the spider's legs, and how might these legs help it survive in nature? (Bloom's: Analyze | DOK: 2)

2. If a spider eats insects and birds eat spiders, how would losing all the spiders in a garden affect the insects and birds? (Bloom's: Evaluate | DOK: 3)

3. Why do you think spiders are found in almost every part of the world, even in deserts and rainforests? (Bloom's: Synthesize | DOK: 3)

4. How is a spider's body similar to and different from an insect's body? (Bloom's: Compare | DOK: 2)

Extension Activities

1. Spider Web Investigation: Take students on a nature walk to observe real spider webs in different locations (on trees, bushes, buildings). Have students sketch the webs, describe their locations, and hypothesize about why spiders build webs in those specific spots. Discuss what types of insects might get caught in each web based on its location.

2. Design a Spider Habitat: Provide clear plastic containers, soil, leaves, twigs, and other natural materials. Have students design and build a habitat for a non-threatening spider species (with teacher supervision or use of images). Students should research what spiders need to survive and explain their design choices. Connect this to adaptation and environmental needs.

3. Food Web Creation: Have students create a food web poster or digital diagram that includes spiders, insects, plants, and larger predators. Students should use arrows to show energy flow and label each organism's role (producer, consumer, predator, prey). Emphasize how spiders are essential links in food chains.

NGSS Connections

Performance Expectation:
5-LS1-1: Support an argument that plants get the energy they need to grow chiefly from sunlight. 5-LS1.C Energy and Matter

Performance Expectation:
5-LS2-1: Develop a model to describe that organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. 5-LS2.A 5-LS2.B Interdependence of Life

Performance Expectation:
3-LS1-1: Develop models to describe that organisms have unique and diverse life cycles but all have in common birth, growth, reproduction, and death. 3-LS1.B Patterns

Crosscutting Concepts: Structure and Function | Cause and Effect

Science Vocabulary

* Adaptation: A special body part or behavior that helps an animal survive in its environment.

* Predator: An animal that hunts and eats other animals for food.

* Abdomen: The back part of a spider's body where silk is made.

* Carnivore: An animal that eats only meat or other animals.

* Exoskeleton: A hard outer covering that protects a spider's body (like a suit of armor).

* Web: A structure made of silk that spiders build to catch insects for food.

External Resources

Children's Books:
The Itsy Bitsy Spider* by Iza Trapani (narrative exploration of spiders)
Spiders* by Gail Gibbons (informational text with detailed illustrations)
Are You a Spider?* by Judy Allen (interactive identification guide)

YouTube Videos:
* "Life of a Spider" by National Geographic Kids – Explores spider anatomy, web-building, and hunting behaviors in an engaging, age-appropriate format. https://www.youtube.com/results?search_query=national+geographic+kids+life+of+spider

* "How Spiders Make Webs" by Crash Course Kids – Clear explanation of spider silk production and web construction with helpful animations. https://www.youtube.com/results?search_query=crash+course+kids+spider+webs