Orb Weaver

Life Science | Lesson Guide

1st Grade

Photo Description

A large spider with long, thin legs is standing on a person's hand. You can see the spider's brown body and its eight legs very clearly. Spiders are animals that live all around us, and some spiders make sticky webs to catch their food.

Scientific Phenomena

Anchoring Phenomenon: Why do spiders have so many legs, and why do some spiders make webs?

Spiders are living creatures that have eight legs (not six like insects). Their legs help them move quickly and climb on many surfaces. Some spiders, like the orb weaver shown here, spin webs from special silk that comes from their bodies. The web is sticky and helps the spider catch flying insects for food. This is an example of how animals have special body parts that help them survive and find food in their environment.

Core Science Concepts

- Animals Have Different Body Parts: Spiders have eight legs, eyes, and a body that work together. Different animals have different numbers of legs and different features.

- Animals Need Food: Spiders are hunters. They use their webs to catch insects to eat. This shows how animals find and eat food to survive.

- Structures Help Animals Survive: Spider webs are structures that spiders make using silk from their bodies. The web's sticky surface helps the spider catch food, which is a special adaptation.

- Habitats Support Animals: Spiders live in many different places—gardens, homes, trees, and fields. Each habitat provides what spiders need to live.

Pedagogical Tip:

For First Grade, avoid focusing on spider fear. Instead, emphasize that spiders are helpful hunters that eat pest insects. Use calm, matter-of-fact language: "Spiders are animals, just like dogs and birds." Many students may have spider anxiety, so normalize them as beneficial organisms. If a student is afraid, validate the feeling while gently providing accurate information.

UDL Suggestions:

Multiple Means of Engagement: Some students may be nervous about spiders. Provide options: students can observe from a distance, look at pictures, or handle a toy spider instead of a real one. Multiple Means of Representation: Use real images, drawings, diagrams, and videos so visual learners see spiders in different ways. Multiple Means of Action/ Expression: Allow students to show learning through drawing, building with materials, acting out spider movements, or verbal discussion—not just writing.

Zoom In / Zoom Out

Zoom In: Spider Silk at the Microscopic Level
If we could look at spider silk through a super-powerful magnifying glass (a microscope), we would see that the silk is made of teeny-tiny threads that are stronger than steel! The silk comes out of special body parts called spinnerets at the spider's rear end. These threads are so thin you can barely see them, but when the spider spins many threads together, they make a strong, sticky web. Scientists study spider silk because it's so strong and might help us make better ropes and materials in the future.

Zoom Out: Spiders in the Food Chain
When we zoom out and look at the whole neighborhood or garden where a spider lives, we see that spiders are an important part of nature's food chain. Spiders catch and eat insects like flies and mosquitoes, which helps keep the insect population under control. Then, other animals like birds, lizards, and wasps hunt spiders for food. So spiders are in the middle—they eat smaller animals and are eaten by larger animals. This shows how all living things are connected in nature and depend on each other to survive.

Discussion Questions

1. What body parts does a spider have that help it catch food? (Bloom's: Remember | DOK: 1)
2. Why do you think a spider needs eight legs instead of two legs like people? (Bloom's: Analyze | DOK: 2)
3. How is a spider's web like a trap? What does it catch? (Bloom's: Understand | DOK: 2)
4. If a spider didn't have silk to make a web, how else might it catch food? (Bloom's: Evaluate | DOK: 3)

Potential Student Misconceptions

Misconception 1: "Spiders are insects."
Clarification: Spiders are NOT insects! This is a tricky one. Insects have six legs, but spiders have eight legs. Spiders are their own type of animal called arachnids. Both spiders and insects are small animals, but they are different groups. A good way to remember: count the legs! Six legs = insect. Eight legs = spider.

Misconception 2: "Spiders are mean and want to hurt people."
Clarification: Spiders are not interested in hurting people. Spiders are very small compared to us, and people are way too big to be spider food! Spiders only bite if they feel scared or trapped, and most spider bites don't even hurt people. Spiders are actually helpful because they eat pesky insects like flies and mosquitoes. Spiders want to stay away from us, just like we might want to stay away from something big and scary.

Misconception 3: "All spiders make webs to catch food."
Clarification: Not all spiders make webs! Some spiders are hunters that chase and catch their food, kind of like how a cat hunts a mouse. Some spiders hide and jump on their prey. Some spiders use their webs like nets to catch insects. Different spiders have different ways of finding food, just like different animals hunt in different ways.

Extension Activities

1. Spider Leg Walk: Have students practice walking on their hands and feet like a spider, using four limbs. Discuss how having eight legs (or using four) helps animals move in different ways. This kinesthetic activity helps students understand that body structures match what animals do.

2. Make a Web with Yarn: Provide yarn, sticks, and tape. Students create their own "web" by stretching yarn between sticks in a pattern. Then, place small foam pieces ("insects") on the web and discuss how the sticky structure helps catch food. This connects structure to function.

3. Spider Observation Journal: If safe and age-appropriate, observe a live spider (in a clear container) or show pictures/videos. Students draw what they see and dictate or write one thing the spider is doing. Focus on: Where is it? What is it doing? What do its legs look like?

Cross-Curricular Ideas

Math Connection: Counting Legs and Patterns
Have students count the spider's legs (eight) and compare to other animals: "How many legs does a dog have? A bird? A person?" Create a simple chart or picture graph showing which animals have 2, 4, 6, or 8 legs. Students can sort toy animals or pictures into groups by number of legs, practicing basic counting and comparison skills.

ELA Connection: Spider Story and Descriptive Language
Read The Very Busy Spider by Eric Carle together. Then, have students dictate or write a simple sentence about the spider in the photo using descriptive words: "The brown spider has long, thin legs." Create a class "Spider Word Wall" with words like crawl, spin, web, and creep. Students can also act out spider movements while you read spider stories aloud.

Art Connection: Web Design and Nature Art
Students create their own spider webs using white glue on black paper, or by arranging yarn in web patterns. They can paint or color around their web designs and add drawn insects. This hands-on activity helps them understand how webs are structured and gives them a creative way to express what they learned about spider habitats and hunting.

Social Studies Connection: Helping Animals in Our Community
Discuss how spiders help our homes and gardens by eating bugs. Talk about being good neighbors to the animals that live near us. Students can create a simple "How to Help Spiders" poster or chart: "Don't kill spiders—they help us! Let spiders live in corners and gardens. They keep bugs away." This builds empathy for living things and environmental awareness.

STEM Career Connection

Spider Scientist (Arachnologist)
A spider scientist is a person who studies spiders—how they live, what they eat, how they make webs, and how they help nature. These scientists observe spiders in gardens and forests, take pictures and videos of them, and learn new things about spiders that help us understand nature better. Some spider scientists work to help people who are scared of spiders feel less afraid by teaching them that spiders are helpful and safe.
Average Annual Salary: $65,000–$85,000 USD

Biomimicry Engineer
A biomimicry engineer is someone who looks at how animals and nature work, then uses those ideas to invent new things for people. Spider scientists and engineers study spider silk to figure out how to make super-strong materials for ropes, clothes, and armor. By copying nature's designs, these engineers create better tools and products that help people.
Average Annual Salary: $70,000–$95,000 USD

Pest Control Specialist
A pest control specialist helps keep homes and gardens safe and healthy by managing bugs and pests. Some pest control specialists encourage natural solutions, like letting spiders live in homes and gardens because spiders eat mosquitoes, flies, and other unwanted insects. These workers teach people that spiders are good helpers instead of pests to be scared of.

Average Annual Salary: $55,000–$75,000 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.
- K-LS1.C All animals need food; plants need water and light.

Crosscutting Concepts:
- Structure and Function — Spider legs and webs have specific structures that help spiders do what they need to do.
- Patterns — Spiders show patterns in how they build webs and hunt for food.

Science Vocabulary

- Spider: A small animal with eight legs and a body that makes silk to build webs.
- Web: A sticky net that a spider builds to catch insects for food.
- Legs: The eight moving body parts that help a spider walk and climb.
- Silk: A thin, strong material that comes from a spider's body and is used to make webs.
- Insect: A small animal with six legs (like ants, beetles, and flies) that spiders hunt for food.
- Habitat: The place where an animal lives and finds everything it needs.

External Resources

Children's Books:
- The Very Busy Spider by Eric Carle — A classic picture book showing a spider building a web, perfect for First Grade.
- Are You a Spider? by Judy Allen and Tudor Humphries — Follows a spider's life cycle and behaviors in simple language.
- Spinning Spiders by Melvin Berger — Non-fiction book with photos and simple facts about how spiders spin webs.

Teacher Note: This lesson builds foundational understanding that animals have different structures suited to their survival needs. First graders are naturally curious but may also be fearful of spiders. Create a safe, positive learning environment by emphasizing that spiders are helpful and belong in nature. Use real observations and play-based activities to deepen understanding.