

## Photo Description



This black and white photograph shows a delicate spider web covered in tiny water droplets that make it sparkle and shine. The web is stretched between green leaves and plants, creating a perfect geometric pattern with lines that go round and round from the center outward, like a beautiful spiral or target. You can see the web is sticky and strong, even though it looks thin and feathery.

## Scientific Phenomena

Anchoring Phenomenon: How did the spider make this sticky web, and why does it catch bugs?

Spiders spin webs using silk that comes from their bodies—a special material that is stronger than steel but very thin and light. The web is sticky because of the way the spider designs it, with some parts dry and some parts gooey. When insects fly into the web, they get stuck, and then the spider can catch them for food. The water droplets in this photo show us the web is really there—we can see each tiny dewdrop hanging on the silk strands. This demonstrates that living things (spiders) build structures in nature to help them survive and get food.

## Core Science Concepts

- \* Animal Structures and Functions: Spiders have special body parts (called spinnerets) that make silk. The web is a structure that the spider builds to catch food and helps the spider survive.
- \* Adaptation and Survival: A spider web is an adaptation—a special feature that helps spiders catch insects they need to eat. It shows how animals are designed by nature to do specific jobs.
- \* Patterns in Nature: Spider webs follow a geometric pattern that repeats—lines going out from the center in a circular design. This pattern is organized and predictable, and it appears the same in many different spider webs.
- \* Properties of Materials: Spider silk is lightweight, strong, and flexible. The web can stretch and bend without breaking, which helps it catch flying insects without tearing.

### Pedagogical Tip:

For Kindergarteners, focus on direct observation and wonder rather than complex explanation. Use phrases like "the spider made this" and "it's sticky so bugs get stuck." Avoid detailed discussion of spider anatomy. Instead, emphasize the visible pattern and the purpose: catching food. Use the web as a jumping-off point for curiosity about how and why animals do things.

### UDL Suggestions:

Multiple Means of Representation: Provide real spider web images, tactile models (yarn webs children can touch), and allow students to draw or trace web patterns. Multiple Means of Action & Expression: Let students build their own "webs" using yarn, string, or tape on a frame to physically understand the structure. Multiple Means of Engagement: Connect to students' own experiences: "Have you seen a web? Where? What did it look like?" This builds personal relevance and excitement.

## Zoom In / Zoom Out

### Zoom In: Spider Silk at the Tiny Level

If we could use a super-powerful microscope to look at spider silk, we would see it is made of very, very tiny fibers—almost like the smallest threads you could ever imagine! The silk is so small and thin that many strands twisted together make one thread of the web. The sticky parts of the web are coated with a gooey liquid that is even smaller than we can see with our eyes. This sticky coating is what traps bugs! The spider's body has special tiny openings called spinnerets where the silk comes out, kind of like tiny silk-making factories inside the spider.

### Zoom Out: The Spider Web in Nature's Community

A spider web is part of a much bigger picture. The spider uses the web to catch insects like flies and mosquitoes. Those insects were eating plants and drinking nectar. The spider eats the insects and helps control the insect population. If a bird comes along, it might eat the spider! The web is also attached to plants—leaves, branches, and flowers. All of these living things are connected in a web of life (a real-life "food web"!). The web also shows us about the weather: when dew or rain collects on it, we can see the web and know it's been wet outside. The spider web is one tiny part of the whole garden, forest, or yard ecosystem where many creatures depend on each other to survive.

## Discussion Questions

1. What do you see in this picture? What does the web look like to you? (Bloom's: Remember | DOK: 1)
2. Why do you think the spider made this web? What could it be used for? (Bloom's: Infer | DOK: 2)
3. How is a spider web like other things you know about? What is it similar to? (Bloom's: Analyze | DOK: 2)
4. If you were a tiny bug flying through the air, what would happen if you touched this sticky web? Why? (Bloom's: Evaluate | DOK: 3)

## Potential Student Misconceptions

### Misconception 1: "Spiders are bugs."

Clarification: Spiders are not bugs—they are arachnids! Bugs have six legs, but spiders have eight legs. Spiders are special animals that are different from insects. However, spiders catch bugs in their webs to eat them. You can say: "Spiders are hunters. They catch the bugs that fly into their sticky web!"

### Misconception 2: "The spider web is sticky all over so the spider gets stuck too."

Clarification: The spider web has different kinds of silk. Some parts are sticky, and some parts are not sticky. The spider knows exactly where the dry, non-sticky parts are, so it can walk on its own web without getting stuck! The spider's feet are special and don't stick the way an insect's feet do. You can say: "The spider is so clever! It knows the safe paths on its own web, so it doesn't get stuck like the bugs do."

### Misconception 3: "Spiders spin new webs every day because they wear out."

Clarification: Spiders actually rebuild their webs regularly, but not because they "wear out"—they do it because webs get damaged when insects struggle in them, or the wind blows them, or rain makes them heavy. Also, the sticky coating can lose its stickiness over time. So the spider repairs and rebuilds its web to keep it working well for catching food. You can say: "When a bug gets stuck in the web, it tears a little hole. The spider has to fix it, kind of like patching a hole in a sock!"

### Extension Activities

#### Activity 1: Make a Web with Yarn

Provide students with a square or circular frame (cardboard, hula hoop, or string) and yarn. Students work in pairs or small groups to stretch yarn across the frame in different directions, creating their own "spider web." This builds fine motor skills and helps them understand how a web is constructed. Discuss: "What patterns did you make? Is your web sticky like a real spider web?"

#### Activity 2: Web Hunt Nature Walk

Take the class on a short nature walk around the school grounds or nearby area to search for real spider webs, especially in early morning when dew makes them visible. Bring magnifying glasses if available. Students observe webs from a safe distance without touching them. Back in class, draw or paint pictures of the webs they found. Ask: "Where did you find your web? Why do you think the spider chose that spot?"

#### Activity 3: Sensory Web Exploration

Create a large floor or wall web using masking tape or yarn. Blindfold students (or have them close their eyes) and gently guide them to walk or crawl through the web. Ask them to describe what they feel and experience. Discuss how a web might feel to an insect and how it helps the spider know when something is caught. Connect to the idea that spiders sense vibrations in their webs.

### Cross-Curricular Ideas

#### Math Connection: Patterns and Geometry

Spider webs are full of patterns! Students can observe the circular and radial pattern in the photo (lines going out from the center like spokes on a wheel). Create a math activity where students use a large circular piece of paper and yarn or string to recreate the web pattern by gluing yarn in radial lines. Count the number of "spokes" or sections. Sort spiders webs by the number of concentric circles. Discuss: "Does your web have the same number of sections as your partner's web?"

#### ELA Connection: Storytelling and Pattern Language

Read *The Very Busy Spider* by Eric Carle, which uses repetitive, predictable language perfect for Kindergarten. Students can retell the story using sequence words: "First the spider... Then the spider... Next the spider..." Students can also create their own repetitive stories: "A spider spins round and round. A fly flies by and by. The web goes this way and that way." Create a class big book where each page follows the pattern: "[Animal] sees the spider web and says/does \_\_\_\_."

#### Art Connection: Web Creation and Mixed Media

Students can create three-dimensional spider webs using various materials: cotton string on black paper, yarn on cardboard frames, or even tape on windows. After creating the web structure, students can add "dew drops" using white paint, glitter glue, or clear sequins to mimic the droplets in the photo. Display the webs around the classroom and create a gallery walk where students observe and compare the different webs. Photograph the results and create a "Web Gallery" display or digital slideshow.

#### Social Studies Connection: Homes and Structures

Just as humans build homes to live in and survive, spiders build webs as their homes where they live, hunt, and rest.

Discuss with students: "A spider web is a spider's house. It's where the spider lives and where it gets its food. What is your house for? How is a spider web like a house?" Students can draw pictures of their own homes and label the different parts (bedroom, kitchen, etc.), then compare these to the different parts or "rooms" of a spider web. This builds understanding that all animals, including humans, need structures to survive.

## STEM Career Connection

### Arachnologist (Spider Scientist)

An arachnologist is a scientist who studies spiders—how they live, what they eat, how they build webs, and what kinds of spiders exist in the world. Arachnologists go outside to find and observe spiders, take pictures of them, and sometimes bring them back to a lab to study. They learn amazing things about spiders and teach other people about them. Some arachnologists help people understand that spiders are helpful and not scary! If you love spiders and like to observe and ask questions about how they work, this could be a job for you!

Average Annual Salary: \$65,000–\$85,000 USD

### Biomimicry Engineer

A biomimicry engineer is someone who studies how nature works—like spider webs—and uses those ideas to create new things for people. For example, scientists have learned from spider silk and are trying to make super-strong, lightweight materials that could be used for clothing, ropes, or even space suits! These engineers solve human problems by copying nature's clever designs. They ask questions like: "What can we learn from a spider web that could help us build something better?" If you love spiders and like to invent and create, this job might be perfect for you!

Average Annual Salary: \$70,000–\$95,000 USD

### Nature Photographer

A nature photographer takes beautiful pictures of animals, plants, and natural objects—like the amazing photo of the spider web with dewdrops you see here! These photographers go outside into gardens, forests, and meadows to find and photograph spiders, insects, and other creatures. They use special cameras and lenses to capture tiny details that most people never see. Nature photographers share their pictures with the world through books, magazines, websites, and museums so that everyone can learn to love and appreciate nature. If you like taking pictures and exploring outdoors, this could be a great career for you!

Average Annual Salary: \$55,000–\$80,000 USD

## NGSS Connections

Relevant 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 Animals have body parts that help them sense the world and help them perform daily functions necessary to survive.
- K-LS1.D All animals have life needs. Animals obtain food from plants or other animals; plants get water from the soil and light from the sun.

### Crosscutting Concepts:

- Patterns The web shows a repeating pattern that is organized and beautiful.
- Structure and Function The web's sticky structure allows it to function as a tool for catching food.
- Systems and System Models A spider web is part of a larger system: the spider, the web, the insects it catches, and the plants it hangs from all work together.

## Science Vocabulary

\* Spider: A small animal with eight legs that can spin silk to make webs.

\* Web: A net-like structure made of thin, sticky threads that a spider builds to catch insects.

- \* Silk: A special, strong, thin material that comes from a spider's body and is used to make webs.
- \* Sticky: Something that holds on to other things because it is wet or gooey.
- \* Pattern: A design that repeats the same way over and over again.
- \* Structure: The way something is built or put together.

### External Resources

Children's Books:

- The Very Busy Spider by Eric Carle (classic story about a spider spinning a web, with tactile web to touch)
- Spider and the Fly by Tony DiTerlizzi (beautiful illustrations, engaging narrative)
- Charlotte's Web by E.B. White (advanced for older K students, but excellent read-aloud with pictures)

---

Teacher Note: This lesson emphasizes observable features and wonder, which are developmentally appropriate for Kindergarten. The focus is on what students can see and why it matters for the spider's survival, rather than on complex biological mechanisms. Encourage curiosity, hands-on exploration, and creative thinking throughout.