

## Photo Description



This black and white photograph shows a delicate spider web covered in tiny water droplets or dew. The web is stretched between plants and appears perfectly symmetrical, with the spider's careful thread work clearly visible. The droplets make the web stand out against the blurred background, helping us see this amazing structure that spiders build to catch food.

## Scientific Phenomena

Anchoring Phenomenon: A spider web structure with visible geometric patterns and morning dew.

Why This Happens: Spiders produce silk from special structures in their bodies called spinnerets. This silk is incredibly strong and flexible—stronger than steel of the same thickness! Spiders instinctively arrange their silk in a circular, web-like pattern because this design is very efficient at catching insects. The water droplets (dew or morning moisture) collect on the web strands, making the normally invisible web visible to our eyes. The spider positions itself on the web to feel vibrations when insects get stuck, alerting the spider to its caught prey.

## Core Science Concepts

- \* Animal Structures and Functions: Spiders have special body parts (spinnerets) that produce silk. This is an example of how animals have specific structures that help them survive and meet their needs.
- \* Design in Nature: The spider web's circular, geometric pattern is not random—it serves a purpose. This demonstrates how organisms use efficient designs to solve problems (catching food).
- \* Life Cycles and Behaviors: Web-building is an inherited behavior—baby spiders know how to build webs without being taught. This instinctive behavior helps spiders find food.
- \* Properties of Materials: Spider silk has unique properties: it's stretchy, strong, and sticky in some species. Understanding material properties helps us understand how animals use materials from their own bodies.

### Pedagogical Tip:

Consider starting with a sensory observation activity before diving into explanations. Have students observe a real spider web (or the photo) and describe what they see, hear, and feel (without touching the web itself) before you introduce the "why." This anchors their learning in observable phenomena and builds curiosity naturally—the foundation of scientific thinking.

### UDL Suggestions:

Representation: Provide students with tactile models of webs (yarn stretched on cardboard frames) so kinesthetic learners can feel the structure. Some students may benefit from labeled diagrams showing the spider's body and spinnerets. Action & Expression: Allow students to demonstrate understanding through drawing, building models with string, or even acting out a spider's web-building movements. Engagement: Connect to student interests by asking, "Have you ever seen a web? Where? What did it look like?" This personalizes the learning and validates diverse observations.

## Discussion Questions

1. What do you think the spider uses its web for, and why do you think the web is made in a circular shape?  
(Bloom's: Analyze | DOK: 2)
2. If you could change one thing about the spider web's design, what would it be and why?  
(Bloom's: Evaluate | DOK: 3)
3. How is a spider web similar to and different from a bird's nest?  
(Bloom's: Compare/Contrast | DOK: 2)
4. What do you observe about the dew on the web, and what might the water tell us about when this photo was taken?  
(Bloom's: Observe & Infer | DOK: 1–2)

## Extension Activities

1. Web-Building Challenge: Provide students with yarn, sticks, and a frame (cardboard or a wire hanger bent into a circle). Challenge them to design and build their own "web" using the yarn. Afterward, discuss: Did you make it circular like a real spider? Was it easy or hard? What problems did you solve? This builds design thinking and appreciation for spider engineering.
2. Dew Observation Walk: Take students on a nature walk on a dewy morning (or after the sprinkler runs). Have them locate spider webs and observe the water droplets. Discuss why the dew makes the web visible. Sketch or photograph what they find. This connects classroom learning to real-world observation.
3. Spider Web Symmetry Art: Provide students with dotted circle templates and have them create their own symmetrical web designs using markers, string, or paint. Challenge them to make their web pattern match a real spider web. Discuss symmetry and patterns in nature. This integrates art and geometry while reinforcing the web's structural design.

## NGSS Connections

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.

Disciplinary Core Ideas:

- \* 3-LS1.B Growth and Reproduction of Organisms
- \* 3-LS1.D Information Processing

Crosscutting Concepts:

- \* Structure and Function
- \* Patterns

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## Science Vocabulary

- \* Spider silk: A strong, stretchy material that spiders produce from their bodies to build webs and catch food.
- \* Spinnerets: Tiny body parts on spiders that produce and spin silk into thread.
- \* Web: A structure made of silk threads arranged in a pattern to catch insects for food.

- \* Inherited behavior: An action or skill that an animal knows how to do without being taught, passed down from parents.
- \* Dew: Tiny water droplets that form on plants and objects early in the morning or late at night when it's cool.
- \* Geometry: The shapes and patterns we see in nature, like the circular design of a spider web.

### External Resources

Children's Books:

- Are You a Spider?\* by Judy Allen and Tudor Humphries (explores spider anatomy and behavior in an engaging format)
- The Very Busy Spider\* by Eric Carle (classic story about web-building with tactile web illustrations)
- Spiders\* by Gail Gibbons (informative non-fiction with clear illustrations of web types)

YouTube Videos:

- \* "How Spiders Make Webs" by National Geographic Kids — A 3-minute time-lapse video showing a spider building its web from start to finish. Stunning visuals and age-appropriate narration.  
<https://www.youtube.com/watch?v=SQKHHnVn5FY>
- \* "Spider Webs: Nature's Amazing Engineers" by PBS Learning Media — An engaging explanation of why spider webs are designed the way they are, with real footage and animations suitable for third graders.  
<https://www.pbslearningmedia.org> (search "spider webs")

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Teacher Tip: This lesson pairs beautifully with a live observation activity. If possible, locate or create a spider habitat in your classroom so students can observe web-building behavior over time. Remember to release the spider safely or contact a local naturalist for guidance. Students often develop genuine respect and curiosity about spiders when they observe them directly!