Spiders in the Garden

Let's go searching for spiders and their webs.

Spiders are fascinating creatures and lucky for you, wherever you are, you will find spiders nearby.

Your quest: to find, carefully look at, and record information about all the different spiders and webs you see. **Do NOT touch the spiders**, though! While you're at it, you will observe the differences between spiders and insects. You will then make an orb spider web of your own. Instruction for web making will come last, after the spider forms and information.

Spider information:

There are more than 800 species (kinds) of spiders in Washington State and there could be up to 25 different species in your yard! Creepy as that may seem, the most common species in Washington rarely harm humans and are actually beneficial organisms. We just need to understand and appreciate their importance in the ecosystem that is your deck, garden, back yard, park, forests, and more. They are food for birds, reptiles, and insects. They in turn eat and control lots of insect pests such as:. aphids, mites, caterpillars, flies, beetles, grasshoppers, leafhoppers, whiteflies, thrips, and mealybugs.

Scientifically speaking:

Spiders *are*:

- Arthropods, which are a large group of animals (such as crabs, insects, and spiders) with jointed limbs and a body made up of segments. They have an exoskeleton (skeleton on the outside), which they outgrow and shed as they increase in size (molt).
- Arachnids, which are a sub-classification (group) of arthropods that have **eight legs** tipped with 2-3 claws, and a body formed of two parts**,** an abdomen, and combination thorax and head called a cephalothorax. They have 6 to 8 simple eyes (with one lens in each) and no antennae. Spiders are meat eaters—carnivores that have fangs (chelicerae), which are hollow to inject venom into prey. They have the amazing ability to spin silk too. Silk is made and released through spinnerets (usually 6) at the back end of the abdomen. They use the silk in many ways: cover eggs (egg cases), make tunnels to live in, or flat places to sit on and under, or stretch between branches into beautiful webs. Different kinds of spiders make different kinds of webs, but they make webs for one purpose, to catch lunch. Not all spiders spin webs though. Not all arachnids are spiders.

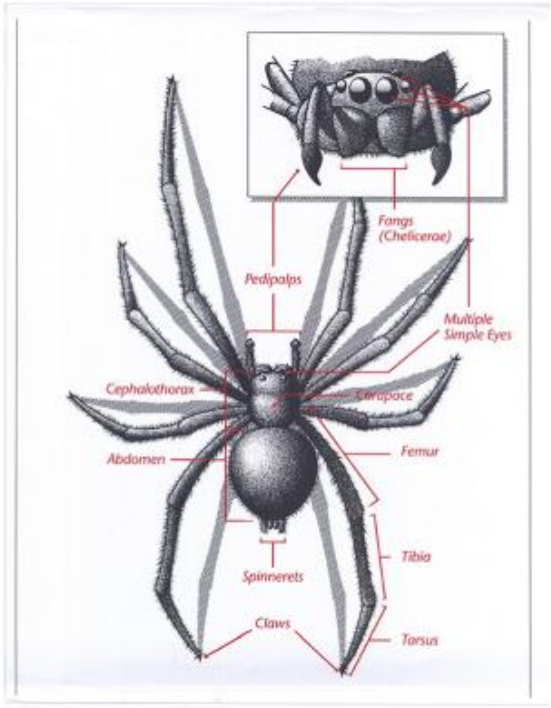

Figure 1. Dorsal view of stylized spider with key features identified. Inset—front view of stylized spider head with key features identified. Illustration by Andrew Mack, WSU Puyallup.

Spiders *are NOT*:

- Insects, because they are a different sub-classification (group) of arthropods that have **six legs** and **3 body parts** (head, thorax, abdomen). They have compound eyes (with hundreds of lenses in each), and antennae. They can be meat eaters (carnivores) or plant eaters (herbivores).

Material you need for the search:

- This is a Spider I Found in the Garden paper or just blank paper
- Clipboard or something hard to write on
- Pencil
- Spider Key (below)
- Your "Spidey-sense," of course
- Optional: a spray water bottle that can spray a *light mist* (to highlight delicate web designs)
- Optional: magnifying glass (hand lens)

What to look for:

Different spiders build different kinds of webs.

You might come across webs from the:

- Orb web spider, cobweb spider, cellar spider, funnel web spider and sheet web spiders.

You might also come across spiders that don't make webs at all, like:

- Wolf spiders (on the ground), crab spider (on flowers), jumping spider (tiny guys that I think of as zebra spiders because they are usually black and white), and daddy longlegs (also known as harvestmen—which are not really spiders).

Look over the Spider Key very carefully to tell them and the webs apart.

Where to look for spiders and their webs: Fall is the best time search for spiders. If you can, look early, on a dewy or foggy morning. Webs are more visible with tiny water droplets on them, more beautiful too. If you go on a dry day, take a squirt bottle of water, and use it to MIST the web.

- Along fences and railings
- Along windowsills
- On top of bushes
- Hanging between bushes
- On the ground on the dirt or around rocks
- On the ground under grass

If you can't find spiders look for other clues besides webs.

- Spider egg case (cocoon)
- Wrapped up insect
- Molted spider exoskeleton (skin)

When/if you find a spider, wait patiently and quietly to watch it work.

When observing & drawing look for interesting things like:

- Size, location, and pattern of the web
- Where the web is attached
- Shape, and hairiness of legs
- Designs and patterns on the abdomen
- The spinnerets where the silk for webs comes out
- Things caught in the web
- How the spider acts while on or near the web
- How the spider hangs; with its head up or down
- The type of web; wheel-shaped, funnel, sheet, tangle…
- **GENTLY** touching the WEB to see what happens

Think about these things while searching and observing.

- Where would you like to live if you were a spider?
- How does the silk come out?
- How do spiders know if they are the kind to weave webs, and how to do it, if they are?
- What spider body parts would you think most helpful for survival?
- What kinds of insects might get caught in the different kinds of webs?
- How might spiders that don't weave webs get food?
- Since spiders make different kinds of silk, what are they all used for?
- Why don't spiders get stuck in their own webs? Superpowers?

This is a spider I found in the garden.

Describe what it looks like:

_____

_____

_____

Draw it:

Draw the web:

I think it's a _____
kind of spider.

This is a spider I found in the garden.

Describe what it looks like:

_____

_____

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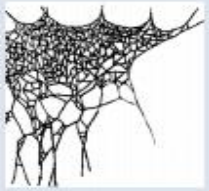
SPIDER KEY

Web-Building Spiders

Sheet Web Spiders


Orb web spider


Cobweb spider


Cellar spider


Funnel web spider


Platform spider

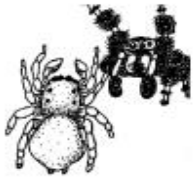

Filmy dome spider


Bowl & doily spider

Spiders without Webs


Wolf & nursery spider


Crab spider


Jumping spider


Harvestmen

Photo and Illustration Credits for the Spider Key and Handouts

Web-building spiders

Orb web: rattyfield
Cobweb: davidm69
Cellar: lygren
Funnel web: kqedquest

Sheet web spiders

Platform: elygren
Filmy dome: Frank Starmer
Bowl & doily: Nancy Magnusson

Spiders without webs

Wof & nursery: wikimedia commons
Crab: dogtooth
Jumping: Andreas Kay
Harvestmen: Ciar

Burrowing spiders

Trapdoor: Jean and Fred
Turret & folding door: Ken-ichi Ueda
Tarantula: quintin

All spider illustrations by Kevin Beals, except funnel spider web by Lisa Baker.

Some Splendid Spider Math:

1. Take the number of spiders you observed and estimate how many might be in the entire space where you were searching (back yard, park, garden bed…).
2. If each of the spiders in the estimate in #1 above eats one insect a day, how many insects will be eaten in one year?
3. If half of #1's estimate is female, and each lay 100 eggs, predict the number of baby spiders that will hatch.
4. If an orb weaver uses 50 feet of silk to make its web each day, how many feet will it spin in a week? A month? A year?
5. If jumping spiders can jump 20 times their body length, how far would you need to jump to match their record?
6. If spider silk can stretch 4 times its original length, how far can a 24-inch piece of silk stretch?

Links:

- Time laps video of an orb spider spinning web: https://wonderopolis.org/wonder/why-do-spiders-spin-webs
- Video of spider catching its lunch: https://www.ngsphenomena.com/spider-web
- *Next Time You See a Spiderweb* by Emily Morgan, book trailer https://www.youtube.com/watch?v=hC-PGlidpxQ
- Arthropod classification chart with information, photos, and sounds https://animaldiversity.org/accounts/Arthropoda/classification/
- The Wonders of Spider Webs—everything you need to know from the Bug Lady https://uwm.edu/field-station/the-wonders-of-webs-i-spider-silk/

Fascinating Facts:

- There are about 40,000 species of spiders in the world.
- Spiders around her live about a year, but some tarantulas can life 30-40 years!
- They have poor eyesight. So, they rely on their claws to pick up movement and vibrations.
- Silk for webs comes out of several spinnerets and woven together like rope.
- As a group, spiders make 6 different types of silk that vary in stickiness, but no one spider makes all 6 types.
- Non-web building spiders use their silk as draglines like the safety ropes rock climbers use, but they use it to escape danger or grab something for lunch.
- Baby spiders actually **fly** away after they escape their egg case. They actually make a strand of silk, which catches the wind, and floats the spider to someplace nearby or miles away. This is called ballooning or parachuting.
- Spiders can only eat liquid foods. So, they inject prey with enzymes that dissolves body tissue, which is then sucked up as liquid.
- Some jumping spiders can jump 10 to 50 times its own body length.
- Some crab spiders can change to the color of the flower they hide in.
- Spider blood is usually blue.
- They don't have eardrums, but they can "hear" vibrations in the air. They rely on super sensitive hairs on their legs.
- Silk can stretch more than 4 times its length without breaking.
- Spider silk is less than 1/100th of an inch but stronger, by weight, than steel.
- Scientists are hoping to create artificial spider silk for many purposes: body armor, biodegradable bottles, bandages, surgical thread, artificial tendons or ligaments, support for weak blood vessels, mechanical and structural uses and even to make music with man-made, life sized webs!
- Under a microscope each strand of silk has little drops of sticky liquid strung along it like beads
- Most orb webs only take 30 minutes to build.
- If part of the web gets torn, the spider eats up the pieces and then reweaves repairs.
- Some orb weavers eat and reweave their webs daily.

Fun Book Suggestions

A Spider's Life (Science Slam: Animal Diaries: Life Cycles) by Ellen Lawrence
Aaaarrgghh! Spider! by Lydia Monks
Anansi the Spider by Gerald McDermott
Andy the Spider by Samantha Rindfuss
Are you a Spider by Judy Allen (Backyard Book series)?
Be Nice to Spiders by Margaret Bloy Graham
Bear's Scare by Jacob Grant
Charlotte's Web by E.B. White
Diary of a Spider by Doreen Cronin
Frank the Seven-Legged Spider by Michaele Razi
I'm Trying to Love Spiders by Bethany Barton
Little Miss Spider by David Kirk
Miss Spider's Tea Party by David Kirk
Nefertiti the Spidernaut by Darcy Pattison
Next Time You See a Spiderweb by Emily Morgan
Orb Weavers: Hungry Spinners (Arachnid World) by Sandra Markle
Please Don't Step on Us by Casey Crayne
Sneaky, Spinning Baby Spiders by Sandra Markle
Sophie's Masterpiece by Eileen Spinelli
Spider for Kids by Melissa Ackerman
Spider Rider by Sigal Adler
Spiders 101 super fun facts and amazing pictures by Janet Evans
Spiders by Gail Gibbons
Spiders by Kay de Silva (Our Amazing World series)
Spiders by Laura Marsh (National Geographic Kids)
Spiders by Nic Bishop
Spiders! Get caught in the web of these eight-legged creatures by Nicole Iorio
Spiders: Strange and Wonderful by Laurence Pringle
Spinderella by Julia Donaldson
Spinning Spiders by Melvin Berger
Stronger Than Steel: Spider Silk DNA by Bridget Heos
Super Spiders by Charlotte Guillain
The Eensy Weensy Spider Freaks Out by Troy Cummings
The Eensy-weensy Spider by Mary Ann Hoberman
The Magic School Bus Spins a Web by Joanna Cole
The Spider Survival Guide by Matthew Parkins
The Spider: The Disgusting Critters Series by Elise Gravel
The Very Busy Spider by Eric Carle
The Weaver by Qian Shi
Up, Up, and Away by Ginger Wadsworth
Urgency Emergency! Itsy Bitsy Spider by Dosh Archer
Walter's Wonderful Web by Tim Hopgood

Let's make a spider web.

While weaving your web, consider the precision, gentleness, and skill it takes a spider to make its web.

Web making materials you need:

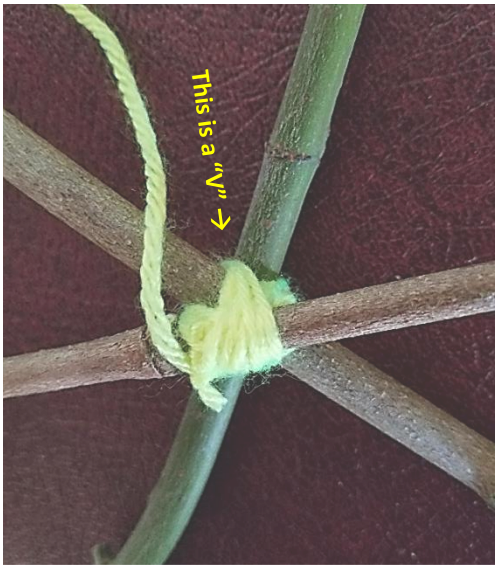
- 3 sticks about ¼ to ½ inch thick and 18-24 inches long (try to get/cut them the same length)
- Yarn or string (lots—20feet or more)
- Scissors
- Maybe a helper to hold the yarn as you wrap it around the sticks

Steps for making the web:

1.Collect all your supplies: 3 sticks, yarn (string or twine), and scissors.

2.Cut your yarn/string to 20 feet or more. This example used just under 20 feet.

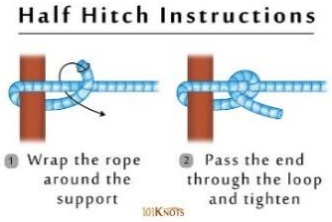
3.Overlap the 3 sticks in the center so they look like spokes on a wheel. Try to make each stick about the same size when measured from the center.



4.Leaving a small tail (about 5 inches) in the yarn, tie it in a knot diagonally between two "Vs," of the sticks where they cross. Then wrap the yarn around those Vs, three or four times. Repeat wrapping three or four times around the other two sets of "Vs." If the sticks are still too wiggly, wrap all three Vs again.

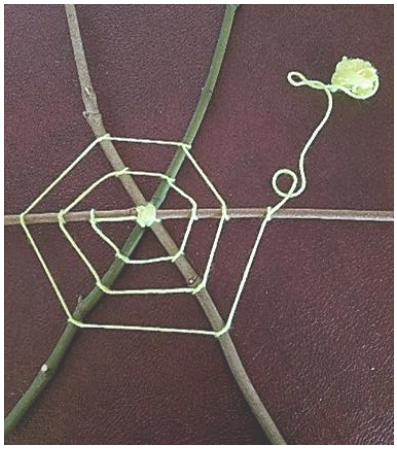
5.Tie the tail and the long piece of yarn into a knot, and snip off the tail.

6.Wind the yarn into a ball to make it easier to work with.

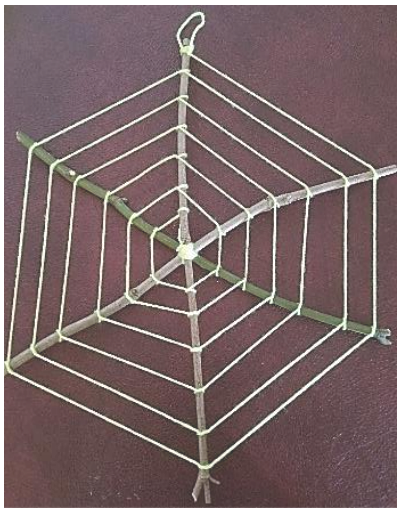


https://www.101knots.com/half-hitch.html

7. Then, make a "half-hitch" knot around one of the sticks. →



8.Continue to make half-hitches on each stick as you spiral around the center.



9. When there isn't much more room to weave your web, tie the yarn into a knot on the last stick, and then make a loop so you can hang up your creation. **Nice job!**