

# Spiders: Silk Spinners

Activities for children and  
adults that build upon PlayTrail  
experiences outdoors



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## Activities for children and adults that build upon PlayTrail experiences outdoors

Getting children comfortable in the outdoors may be one of the greatest gifts we can offer the next generation. Given what we know about the physical and psychological consequences of a sedentary, electronic media-dominated lifestyle, it also might be one of greatest health tips we can offer. A childhood rich in outdoor experiences provides an inexpensive antidote for a number of medical problems, including depression, attention deficit disorder, and obesity.

But there is more. Letting young children freely explore their world outdoors can instill a lifelong connection to the environment. It can also help cultivate an ethic of caring for the environment.

The role of adults in this process focuses less on teaching and more on coaching. While most children want to explore their world, some may be hesitant or even fearful. Parents and other caregivers need to be there to offer encouragement and guidance without stifling the important work called play.

# Tips for adults

We offer the following tips to help make the most of your PlayTrail explorations.

1. Find activities in these booklets that are appropriate for your child's age and interests, as well as environments that are readily accessible to you.
2. Share the booklet with your child in advance.
3. Let your child initiate the exploration, but be ready to offer suggestions in the event encouragement is needed. Consider the booklet's investigations to be jumping-off points that pique curiosity.
4. Avoid the tendency to teach. Share the information you glean from these booklets as "incidental" points of interest.
5. Model positive behaviors and respectful attitudes toward nature.
6. Respect your child's fears. Never force a child to touch something they do not want to touch. Courage and interest come about through positive, graduated experiences.
7. Foster play and accept the fact that dirty hands, mud-caked shoes, and wet clothes often come with it.
8. Avoid the tendency to "helicopter." Too often we over-protect and stifle explorations inadvertently.

## Spiders are not insects!

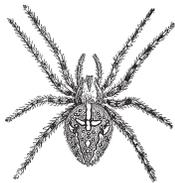
Arachnids, like spiders, hold a few things in common with insects. For one thing, they both lack backbones. Instead, they have a hard outer body covering called an exoskeleton. Both have segmented bodies and more eyes and legs than you do.

Yet spiders are different from insects. Insects have three main body parts—a head, thorax, and abdomen. Spiders have two—a head and abdomen. Insects have six legs and spider have eight. Adult insects have antennae and two pairs of wings<sup>1</sup> and spiders have none. What spiders do have is eight nifty eyes, a hefty set of fangs, and special glands in their abdomen that produce silk.

## Which is which?

Remember climbing on the giant spider model and coming across all of those legs? How many were there?

Compare the two drawings. One is an insect and the other is a spider. Aside from obvious appearance, what sets a spider apart from an insect?



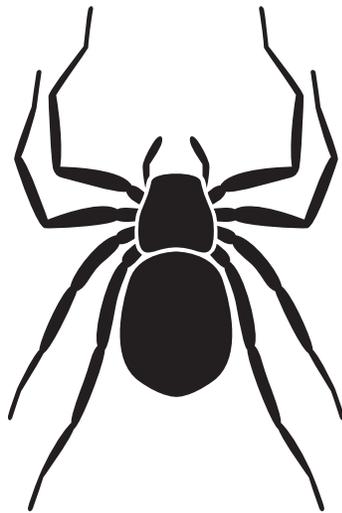
<sup>1</sup>There are exceptions. Ants, silverfish, and a few other insects lack wings and flies have one pair of wings.

## Spider bodies

**Materials:** brown or black construction paper, scissors, up to 10 pipe cleaners (or eight strips of construction paper, each folded like an accordion), small “googly” eyes, glue stick and glue

**Procedures:** For younger children, have an adult use the template to sketch the outline of each body part on construction paper and cut the parts out. In no particular order, arrange the spider’s body parts on a flat space and challenge your scientist to build the spider’s body, securing each part with glue or a glue stick.

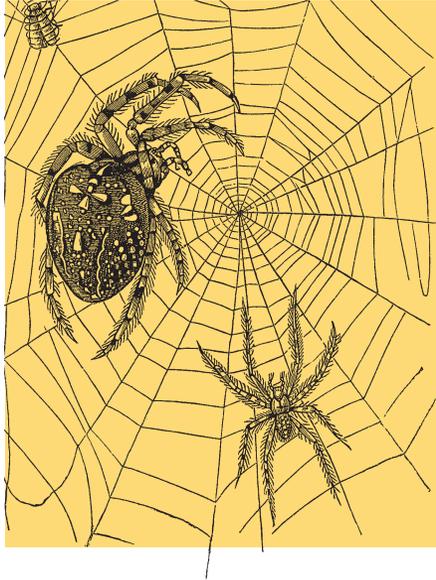
To make it more challenging, cut more body parts than are actually needed (such as three body circles and 10 legs) and see if your scientist catches your “mistake.”



## A wonderful world of webs

Spider webs come in a variety of shapes and sizes. A common garden spider spins a wheel-shaped orb web. A grass spider spins a flat web connected to a tunnel-like hole, or funnel. A house spider spins a cobweb that looks messy. Some spiders, like wolf spiders and crab spiders, do not spin webs at all.

The web crawler you may have climbed is shaped like an orb web. Do you remember the rope strands that attached it to the metal bar? In a real spider web, those sticky, sturdy strands, or radii, attach the web to its frame. When an insect is caught, vibrations on the web travel along those radii and eventually reach the spider. The spider can then figure out where its next meal is waiting.



## Spider web scavenger hunt

It's fun to search for spiders and spider webs in a park or even your backyard, especially in the fall. If you find a web, figure out if it is an orb web, a funnel web, or other type of web. Look around for its owner. Is a spider hanging around the central "hub" of an orb web? Is it resting in the funnel of a funnel web? Is it dangling from a thread of silk while it makes repairs to damaged threads?

When you find a web, pick up a long stick and use it to touch a corner of the web. Gently move the web back and forth. Watch what the spider does. Does it retreat? Does it rush to the scene? Either way, it avoids getting stuck by the sticky threads thanks to the oil that coats its legs.

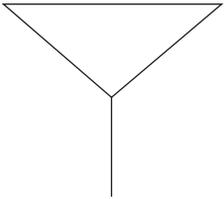
**Safety tip:** Spiders can bite so it is best to avoid touching them.

# Spider web architecture

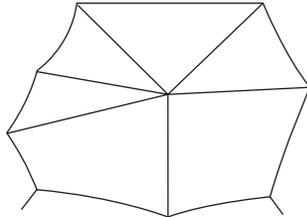
Building an orb web is no easy task. For one thing, you have to make silk. For another, you have to spin the radii and attach them to things like branches before you spin the threads that spiral to create the orb. A spider can build a typical orb web in an hour or less. How long does it take **you**?

**Materials:** white thread, black construction paper, a sewing needle, scissors

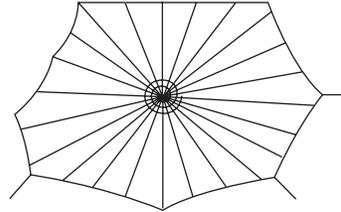
**Procedures:** Since you lack the glands that secrete liquid silk, you will need to use white thread. With the help of an adult, study the drawings and follow these steps: (1) sew a Y shape, (2) add the frame and a few radii, (3) add more radii, and (4) starting at the hub, add the web's spirals. Loop the spiral's thread around each radius to lock it in place.



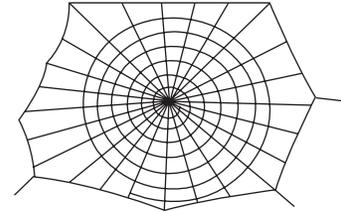
**1**



**2**



**3**



**4**

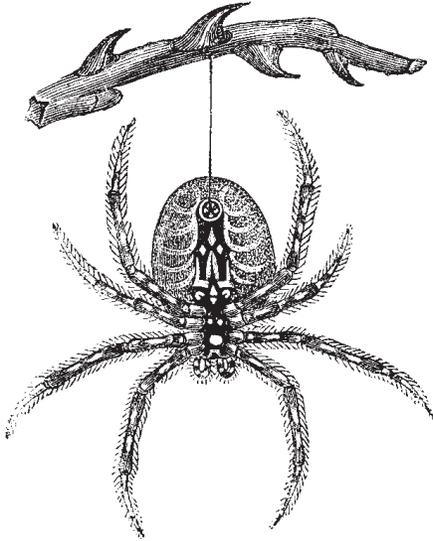
# One web. Many jobs.

Spider webs perform many jobs. They catch dinner, offer hiding places and perches, and serve as protection from predators. Yet not all spider webs work the same way. While orb webs trap flying insects, funnel webs trap crawling insects. Some webs have to move to work. A net-casting spider like the bola spider captures an insect by throwing its silky threads around it.

A web is an efficient way for a spider to catch a meal, but a spider needs a lot of energy to build it. It takes protein to make silk and it takes fresh, sticky silk to “catch” protein (insects). Since silk loses its stickiness over time, a spider must continually rebuild its web. Some orb weavers even eat their own webs to recoup lost energy.

## Life on a dragline

A spider can raise or lower itself on a dragline anchored to a branch or the web. If you find a spider, study its movement. Does it have a dragline? If it happens to fall, how does it get back to its web?



## Citizen Science

Biologists conduct large research studies to catalog how many different kinds of animals exist regionally or even nationally. Sometimes they just focus on one particular species. Often they ask for help because the scope of their research is so large. “Citizen science” invites individuals to record their observations about one or more animals on a website. By doing this, ordinary people contribute important information to a central database that is analyzed by trained biologists.

There are several spider-based “citizen science” projects you can become involved in, including Spider WebWatch. The best way to find out about active ones in your area is to look them up on the Internet or check them out at [www.thedailygreen.com](http://www.thedailygreen.com). Natural history museums, nature centers, and national parks conduct these projects often.

**Conservation message:** Most spiders are harmless to humans and besides, they do us a huge favor by helping control insect populations.

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*Bees: fantastic farmers*

*Birds: engineers by instinct*

*Butterflies: the magic of metamorphosis*

*Forest filtration: nature's air filter*

*Habitats: there's no place like home*

*Leaves: hidden colors*

*Pond Life: a busy ecosystem*

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