WEB IT

Overview

Most of you are familiar with the cobwebs that often adorn corners of houses, garages, or patios. Broom in hand, you brush the sticky threads away, only to find that they have mysteriously reappeared a few days later. These webs are the skillful work of small, eight-legged predators, spiders, which make their own silk and weave it into traps to catch insects and other small animals for food. The reasons that these webs seem to appear from nowhere is that most spiders are active mainly at night. They spend the daylight hours out of sight near the web, unless they are disturbed. (this is a good reason to conduct this activity at night!)

Each different kind of spider prepares a distinctive web trap. There are irregular cobwebs (house spiders), funnel webs (grass spiders), sheet webs, triangle webs, and orb webs. When an insect lands in a web, the spider feels the vibrations on its legs. Each kind of spider has its own method of ensuring that the insect remains entangled. An orb weaver, for example, moves to the insect and draws out more silk from its body to bind its prey. When a spider bites its prey, it injects poison which paralyzes or kills the insect. Juices from digestive glands injected into the prey then liquefy the insect's body and the spider sucks the liquid into its mouth.

We do not know for certain what keeps a spider from sticking to its own web. We do know that web-building spiders produce sticky and non-sticky silk. One explanation is that the spider walks primarily on the non-sticky threads of the web. Specialized claws enable web spiders to grasp and crawl on the web threads. Each kind of spider has claws geared to its own type of web. One kind of spider will stick to the web of a different kind of spider.

Although all spiders are capable of producing silk, not all spiders build webs. Some spiders quietly stalk and then attack their prey, while others camouflage themselves in a flower and wait for an insect.

Safety

Although most spiders are harmless, you should caution the students against handling the spiders. There is one poisonous web spider the students can easily identify and avoid: the black widow. This spider has a rounded, glossy black body, with an hourglass

shaped red or orange mark on the underside of its body. The shape of this mark varies from spider to spider, and some spiders may have more than one mark.

Materials

For each team of two:

- several pieces of flagging (colored ribbon, strips of materials, or plastic flagging) to tie on a bush or tape to a rock or building.
- Piece of masking tape (to tape the flagging to a rock or building).
- 1 sweepnet (see Tool Box 1)
- 1 plastic bag
- Pair of tweezers
- 2 broom straws (or other long, thin sticks)
- 1 magnifying lens* (optional)
- 1 plastic sprayer ("plant mister" available at hardware or grocery store) with water adjusted to fine-mist spray (for daytime activity), OR
- 1 flashlight (for nighttime activity)

For the group:

- Sweepnet" Equipment Card in Tool Box #1

The Time & Place

Web it! Is an excellent nighttime activity. Use flashlights instead of the sprayer to locate and highlight webs.

Many spiders are dormant during the winter, so you will have better luck with this activity at other times of the year.

Heavy rain destroys webs. So wait several days after a rain before attempting Web It! Outdoors. You can use this activity on any kind of day if you have access to an old shed, garage, or other shelter that has webs.

Spiders and webs are everywhere: on buildings, in pipes, on fences, hedges, bushes, and trees, and under outdoor light fixtures. An area that has a variety of potential web sites is best. Survey the area before choosing a location. Practice highlighting and baiting some webs. You can "highlight" a web by spraying it with water (daytime), or shining a flashlight on it (nighttime).

Action

1. Take your group to a spot where you have located some webs. Demonstrate how to locate and highlight almost invisible webs by using the sprayer to gently spray the spot with water. (Morning dew provides the same effect).

Don't destroy the web with the spray. Ask the group what might have constructed the webs and what the webs might be used for.

2. Explain that the majority of spiders are harmless, preferring running to biting. However, caution the students against handling any spider, and describe the black widow. Show them the illustration in this folio.
3. Limit the activity area and divide the group into teams of two. Challenge the group to find as many different kinds of spider webs as they can in the area. If they find a web with a spider on it, have them mark the location of the web with a flag without disturbing the spiders.
4. Distribute one sprayer and several pieces of flagging to each team and start the web hunt.
5. Circulate among the teams, helping them to locate webs and spiders. Make sure the students don't overspray the webs.
6. After ten minutes (or after a number of spiders and webs have been located), call the teams back and collect the sprayers. Ask the teams to describe or point out to the group the different kinds of webs they found. What shape are they? Where are they located? How big are they?
7. Challenge the teams to find out what happens when an insect or other tiny animal falls into the web. Demonstrate how to catch small insects in grassy, weedy areas by using a sweepnet and how to transfer the catch into a plastic bag. (See the "Sweepnet" Equipment Card.) Also, demonstrate how to remove larvae and flying insects from shrubs and trees by placing a plastic bag over a small branch and shaking the branch. Once you have some animals, show the group how to remove and insect from the bag (either using tweezers or fingers) and drop the live insect into the web. The students may have to practice this procedure to be able to successfully transfer the insects. How does the spider approach the insect? What does the spider do when it reaches the bait?
8. Circulate among the teams and help them bait webs.
9. Offer a second challenge to individual teams or the whole group. Find out why spiders don't stick to their own webs. Tell the students they can use a broom straw or other thin stick to gently touch several different web threads. Ask them to determine which threads are sticky and which are not. Tell them to watch a spider move on a web and see which threads the spider walks on. Suggest that by gently touching these threads they can see if these threads are sticky.

WHAT DO YOU THINK?

1. What were some of the different shapes of web traps you observed? Where did you find them?
2. How did the spiders react when you baited their webs? Did all spiders wrap their prey? Were there some insects that did not stick in webs?

3. How do you think spiders avoid sticking to their own webs? Might they stick to other webs? Do you think old, unused webs lose their stickiness?
4. What other animals can you think of that build traps to capture prey?
5. Did you see any spiders that had no webs? How do you think they catch food?

Follow Through

Have the students locate recently constructed spider webs during the day. After dark, they can shine their flashlights through the webs to attract night-flying insects into the webs. Encourage the students to watch and see what happens.

What To Do Next

Web Weavers
Shake It!
Water Striders
Adaptation-Predator-Prey
The Old White Sheet Trick