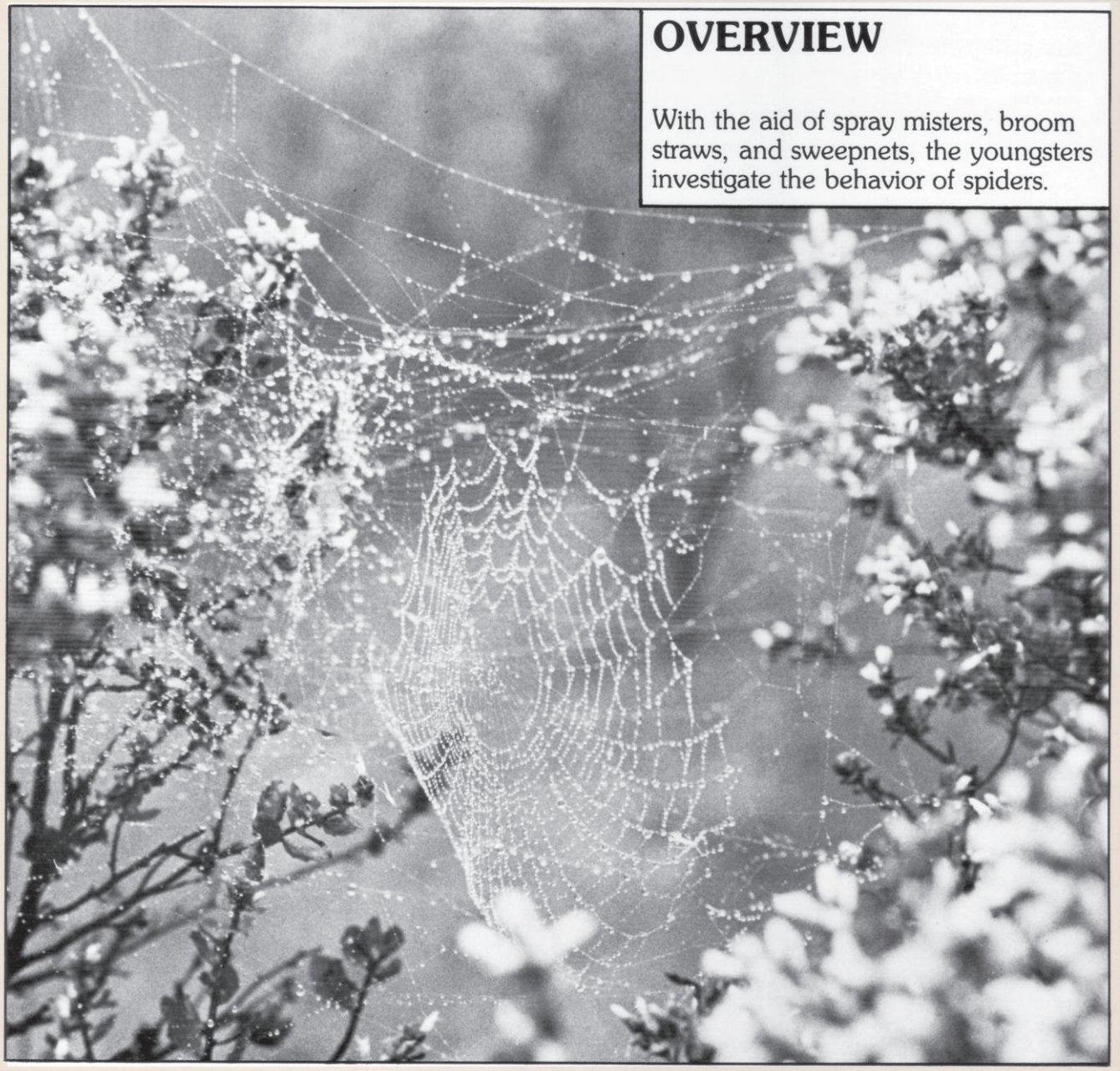
WEB IT



OVERVIEW

With the aid of spray misters, broom straws, and sweepnets, the youngsters investigate the behavior of spiders.

BACKGROUND

Most of us are familiar with the cobwebs that often adorn the corners of houses, garages, or patios. Broom in hand, we brush the sticky threads away, only to find that they have reappeared a few days later. These webs are the skillful work of small, eight-legged predators: spiders. Spiders make their own silk and weave it into traps to catch insects and other small animals for food. Most spiders are active mainly at night, spending the daylight hours out of sight near their webs.

Each distinctive type of web is made by a different kind of spider. There are funnel webs, sheet webs, triangle webs, globe webs, orb webs, and irregular cobwebs. When an insect lands in a web, the spider feels with its legs the vibrations the insect makes and quickly moves to the

BIO KEY

Spider Behavior
Baiting Spider Webs
Predation

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struggling prey. Many spiders bind their prey with silk. Spiders bite their prey to inject a paralyzing poison. Juices from digestive glands injected into the prey liquify the insect's body, and the spider sucks the liquid into its mouth.

We know that web-building spiders produce sticky and non-sticky silk. We do not know for certain what keeps a spider from sticking to its own web, but one explanation is that the spider walks primarily on the non-sticky threads. Specialized claws enable web spiders to grasp and walk on web threads. One kind of spider will stick to the web of another kind of spider.

CHALLENGE: FIND OUT HOW SPIDERS TRAP FOOD IN THEIR WEBS AND YET AVOID STICKING TO THEIR OWN WEBS.

MATERIALS

For each team of two:

several pieces of flagging* (colored ribbon, strips of material, or plastic flagging) to mark the location of webs containing spiders
masking tape* (to stick the flagging to smooth surfaces)
1 sweepnet*
1 plastic bag*
1 pair of tweezers*
2 broom straws* (or long, thin sticks)
1 magnifying lens*
1 spray mister* ("plant mister" available at hardware or grocery stores) for daytime use
1 flashlight* for nighttime use

For the group:

1 "Sweepnet" Equipment Card*

* Available from Delta Education.

PREPARATION

Group Size. This activity works best with groups of eight to twelve youngsters.

Time. Plan on forty to sixty minutes for this activity. *Web It* is an excellent nighttime activity. At night, 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. However, you can conduct this activity on any day if you have access to an old shed, garage, or other shelter that has webs.

Site. Spiders and webs are everywhere: on buildings, in pipes, on fences, hedges, bushes, and trees, and especially under outdoor lighting fixtures. An area that has a large variety of places where spiders build webs is best. Survey the area before choosing a location. You will also need a grassy area for catching insects with the sweepnets.

Practice highlighting and baiting some webs. You can highlight a web by spraying it with water during the day, or shining a flashlight on the webs at night.

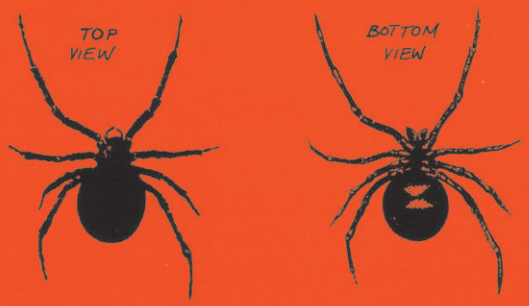
Equipment

1. Spray Misters. Adjust the nozzles of the spray misters to produce a fine mist.

2. Sweepnets. Practice using the sweepnet so you can show the kids how to use it. (See the Equipment Card.)

Safety. Although most spiders cannot harm humans, you should caution the youngsters against handling them. There is one poisonous web spider the youngsters can easily identify and avoid: the Black Widow. This spider has a rounded, glossy black body with an

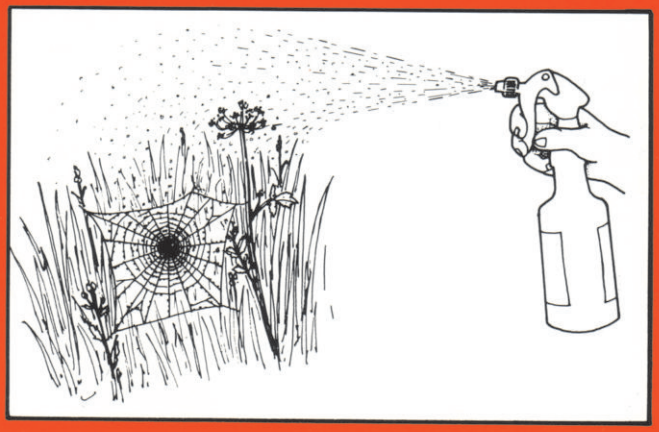
hourglass-shaped red or orange mark on the underside of its body. The shape of this mark varies from spider to spider, and some spiders may have more than one mark.



BLACK WIDOW

ACTION

1. Take your group to the area where you have located webs. Show the youngsters how to locate and highlight the almost invisible webs by using the spray mister to gently spray a likely spot with a fine mist of water. (Morning dew provides the same effect.) Be careful not to 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. However, caution the youngsters against handling any spider, and describe the Black Widow so they can avoid it. Show the youngsters the illustration of the Black Widow in this folio.

3. Establish boundaries for the activity area, and divide the group into teams of two. Give each team one spray mister and several pieces of flagging and masking tape. Challenge the teams to find as many different kinds of spider webs as they can. Tell the youngsters to mark the location of webs that have spiders on them with strips of flagging. Tell the youngsters not to disturb the spiders.

4. Circulate among the teams, helping them locate webs and spiders. Make sure the youngsters do not spray too much water on the webs.

5. After ten to fifteen minutes (or after a number of spiders and webs have been located), call the teams together and collect the sprayers. Ask the teams to describe and point out the webs they found. What shape are the webs? Are they all the same kind? Where are they located? How big are they?

6. Challenge the teams to find out what happens when an insect or other tiny animal falls into a web. Show the kids how to catch small insects in grassy or weedy areas by using a sweepnet and how to transfer the catch into a plastic bag. (See the "Sweepnet" Equipment Card.) You may also demonstrate the removal of larvae and flying insects from shrubs and trees by placing a plastic bag over a small branch and shaking the branch. Once you have collected some animals, show the group how to remove an insect from the bag (using either tweezers or fingers) and drop the insect into the web. The youngsters may have to practice this procedure to be able to successfully transfer the insects without destroying the spider webs. Ask the youngsters to watch how the spider approaches the insect. Ask what the spider does when it reaches the insect.

7. Circulate among the teams and help them bait webs.

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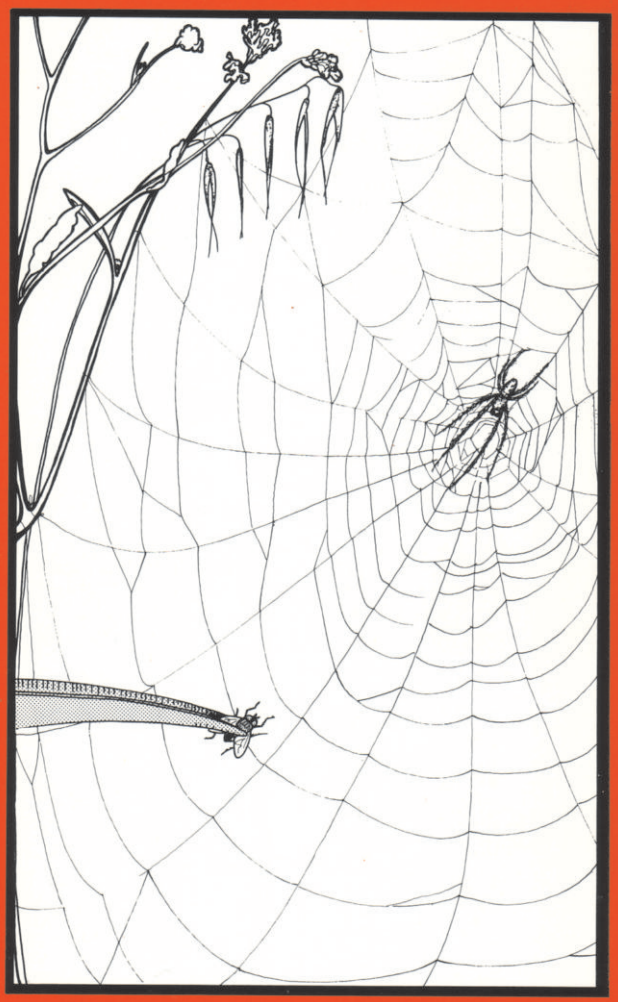


8. Offer a third challenge to individual teams or the whole group: Find out why spiders don't stick to their own webs. Tell the youngsters they can use a broomstraw or thin stick to gently touch several different web threads. Ask them to determine which threads are sticky and which are not. Tell them to watch a spider move on a web and see which threads the spider walks on. The kids should test those threads to see if they are sticky.

SPIDER TALK

1. What were some of the different shapes of the 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 the webs? (Tell the youngsters that animals that eat other animals are called ***predators*** and animals that are eaten are called ***prey***. The act of one animal eating another animal is called ***predation***.)

3. How do you think spiders avoid sticking to their own webs? Might they stick to other webs? How could you find out if 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 have no webs? How do you think they catch food?

BRANCHING OUT

Have the kids locate webs with spiders on them during the day. After dark, ask the youngsters to shine their flashlights through the webs to attract night-flying insects into the webs. Encourage the kids to watch and see what happens.

SWEEPNET

Equipment Card Side 1

Note: Commercially available sweepnets* are more durable and we suggest such an investment for schools, camps, or clubs.

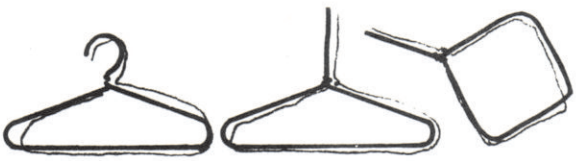
MATERIALS FOR ONE SWEEPNET:

2 wire coat hangers or 1 piece of heavy-duty wire
1 dowel or broom handle about one meter long and 1.5 cm in diameter
1 piece of nylon netting* (mosquito netting), .75 square meter
1 needle and thread for sewing (or a sewing machine)
filament or duct tape*
1 pair of pliers

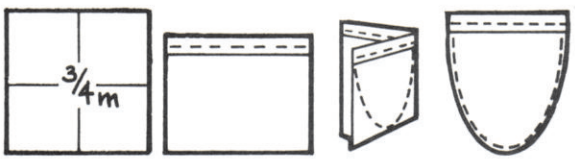
* Available from Delta Education.

MAKING A SWEEPNET:

1. Preparing the Hoop. Take the wire coat hangers, straighten the hooks and pull the hangers together into a square (one hanger on top of the other). The pliers make this job easier.

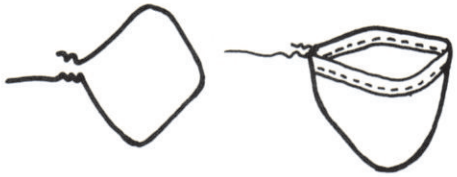


2. Preparing the Bag. Your net should be approximately .75 meter in circumference at the top, tapering down to a point. A sewing machine speeds up construction, but older kids can hand sew the nets if sufficient time is provided. Sew like this:

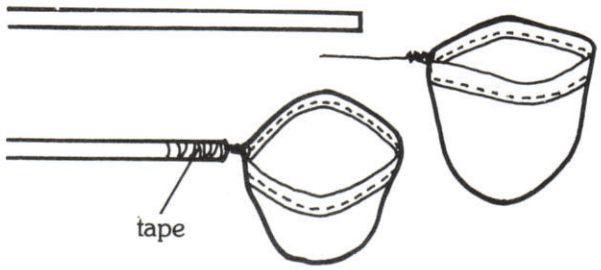


Fold one edge down and sew | Fold square in half and sew | Cut off excess

3. Assembling the Net. Open the wire square (both squares, if you used two hangers) and thread the net on the wire (or wires).



Attach the wire hoop to the stick.



USING A SWEEPNET:

While a sweepnet can be used to pursue and capture an animal that has caught your eye, this is not the most efficient use of the net. A sweepnet is best used as a random sampling tool. You walk at moderate speed across a grassy area, sweeping the net back and forth in pendulum fashion, in front of you. The net should just brush across the top of the grass. The idea is to sweep any animals that are buzzing around in front of you into the nets, so you must turn the net in your hand to capture animals on both right and left swings of the net. After you have made fifteen to thirty swings of the net, make a quick swing around your head to concentrate the animals at the bottom of the net, and grab the top of the net in your hand to keep the catch from escaping.

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SWEEPNET

Equipment Card Side 2

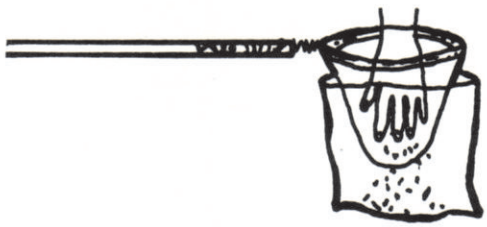
TRANSFERRING ANIMALS FROM THE NET TO AN OBSERVATION BAG:

1. Concentrate the animals in the bottom of the net.

2. Pinch the net closed, keeping the animals in the bottom of the net.

3. Turn the net inside out while holding the animals.

4. Place the net in a plastic bag, then release and shake the animals into the bag.



5. Grab the top of the bag.

6. Twist the top of the bag a couple of times and tuck the top under your belt or into an open pocket while you continue to sweep.

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