



## Teaching in the Gardens and Growing the Future

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### Spider Web Hunt Grade One

#### Lesson Summary

##### When to use this lesson

Use this to practice collecting data using spider webs along the nature trail or in a garden area in late summer. This is best used in September when spiders are still active.

##### Standard

S1L1. Students will investigate the characteristics and basic needs of plants and animals.

b. Identify the basic needs of an animal.

1. Air
2. Water
3. Food
4. Shelter

d. Compare and describe various animals—appearance, motion, growth, basic needs.

MCC1.MD.4 Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

##### Objective

Students understand the characteristics of spiders that help them to live, and practice math skills for organizing data while searching for spider webs.

##### Materials

- Worksheet for each student
- Pencil for each student
- Clipboard for each student
- Magnifying lens for each student
- A spray bottle filled with water to spray on webs to make them easier to see
- A piece of straw or grass to check for sticky and non-sticky threads

##### Estimated Duration

30 minutes

#### Ohio Academic Content Standards Connections

##### Mathematics – Measurement and Data

- Represent and interpret data 1.MD.4. Organize, represent, and interpret data with up to three categories; ask and answer questions about the total number of data points, how many in each category, and how many more or less are in one category than in another.

## Life Science

Living things survive only in environments that meet their needs.

- Effects of seasonal changes within the local environment directly impact the availability of resources.
- Resources are necessary to meet the needs of an individual and populations of individuals. Living things interact with their physical environments as they meet those needs.

Living things have basic needs, which are met by obtaining materials from the physical environment.

- Living things require energy, water, and a particular range of temperatures in their environments.
- Plants get energy from sunlight. Animals get energy from plants and other animals.
- Living things acquire resources from the living and nonliving components of the environment.

### About Spiders

- There are over 30 thousand kinds of spiders.
- Baby spiders are called spiderlings.
- Spiders have 8 jointed legs. If a leg is lost, it will grow back. Spiders “hear” by using the hairs on their legs to find the source of a sound from the air movement from the sound.
- Spiders have two fangs called chelicerae (ku lis' er eye) and two feelers called palps. Palps look like very short legs attached to the front of the spider. Palps are used for sensing and tasting.
- Spiders have 2 body parts joined by a thin tube called the pedicel.
- Spiders usually have 8 eyes (but some species have 12, 6, 4, 2, or no eyes). Spider eyesight varies by family. Some, like wolf spiders and jumping spiders, see clearly and they may see in color; others spiders do not have clear vision. Spiders have main large eyes and secondary eyes that reflect light.
- Spiders breathe through trachea tubes inside a slit on the underside of the abdomen near the spinneret. They also have book lungs, which are alternating layers of air pockets and tissue that look like pages in a book.
- Spiders have a heart that pumps clear blood.
- Spider silk is used by Polynesian fishermen for fishing line. During WWII, Americans used black widow silk threads for measurement in their telescopic gun sights. A Frenchman found a way to make fabric from the silk of egg sacs, but the process was not cost effective based on the amount of silk needed to produce the fabric – 1.3 million sacs for one kilogram of silk (about 2 pounds).
- Spiders are food for praying mantis, snakes, frogs, birds, wasps, fish, lizards, and other spiders.
- Different spiders make different types of webs. Spiders can get caught in spider webs, sometimes even their own webs. Some believe that the claw tips of spiders' legs are oily. However, most feel that spiders rely on using the non-sticky web threads for walking.
- Some spiders do not make webs. The ogre-faced spider hangs from a thread attached to a branch, and catches prey when it comes near. The bolas spider makes no web, but spins a thread that has a ball at the end. The thread is swung at prey to catch the prey. Tarantulas do not make webs, but produce silk to line the bottom of their burrow or to frame the

entrance to warn of intruders. They are the largest spiders (some up to 10 inches across). They eat small birds, snakes, mice, frogs, fish, and insects.

- Harvestmen are commonly called daddy long legs. They are not spiders, but are in the arachnid class, as spiders are. Harvestmen have one body part and do not have venom glands, silk glands, or spinnerets. However, a true daddy long legs spider does exist and has venom and silk glands and two body parts. The daddy long legs spider is commonly found in western United States.

### Activity

- In advance, decide where you will conduct your walk. If you will walk on the trail (or part of the trail), please be sure to sign up on the sheet in the barn.
- It is not necessary to walk along the entire trail for this activity. Simply go in far enough to collect some data, and be able to leave at the end of your class time.
- You may decide to use a garden area for your walk.
- It is not necessary to cover all of the background information above, since you will want to maximize your walk time. Some of the information can be discussed as you walk.
- If you will use the trail, explain to the students some of the basic rules of the nature trail – the leader (you) is always first in line; the teacher is always last in line; never walk off the trail; do not touch the plants or animals on the trail unless instructed; do not remove anything from the trail; listen carefully for instructions; use very quiet voices so you have a chance to see and hear wildlife.
- Before your walk, pass out magnifiers for students to hang around their neck. Explain that the magnifier should not be removed during the walk.
- What do animals need to live? Animals need food, water, shelter, and space from the environment. What special traits do spiders have to help them survive? Webs are one trait of spiders to help them live. How? The webs catch insects and other spiders for the spider to eat.
- Explain to the students that they will take a short walk on the nature trail to locate and count different types of spider webs. Explain that as the seasons change and the air temperature becomes cold, there will be fewer webs. Some spiders will hibernate; others will die after laying eggs in sacs that will be protected during winter.
- Explain the worksheet to the students and talk about the kinds of webs for which they will look.
  - **Sheet web** – This web is usually found in trees, shrubs, or grass, and resembles a hammock. The sheet is horizontal with separate sheets or threads above the web. Prey hits a thread and falls on the sheet, or may fly right into the sheet.
  - **Orb web** – This web is circular with spokes, like a bicycle wheel, and is usually found in open areas of tall grass, bushes, or flowers. First, a thread is attached horizontally at the top. Next, the outside threads are made. The result is a kind of upside down triangle. A thread is dropped from the top to the bottom through the center of the web. Then, threads are added from the middle to resemble the spokes of a wheel. Last, the spokes are connected by coiling circles starting in the center and ending at the edges of the web. The spokes are dry silk and the spiral is sticky silk.
  - **Triangle web** – This web has three sides. The spider usually waits at one end of the web to wait for prey to hit the web. Then, the spider shakes the web to make sure the prey is caught.

- **Tangle web** – This web is also called a cobweb. It has threads going in many directions. House spiders make tangle webs inside. Many types of garden spiders, including the black widow, make tangle webs outside.
  - **Funnel web** – This web is found in grass or low bushes, and appears as a web with a hole in the middle. The spider hides at the end of the hole, and rushes out to capture prey as it comes down the funnel. The funnel is not sticky.
- Explain that we will not touch or disturb the webs or any spiders we find.
  - Use a spray water bottle to spray lightly a hard to see web. The water droplets will make the web easier to see.
  - As you see webs and possibly spiders, discuss some parts related to how the spider gets food and how it eats if you are walking as a large group. If you have split into smaller groups, share some information at the end of the class.
  - Discuss how silk is made and that many webs have sticky and non-sticky silk. Test the threads on webs by touch the threads with a piece of straw or grass. Point out that not all spiders make webs and discuss what those spiders do.
    - Silk for webs is made by spinnerets at the end of the body. Most spiders have 6 spinnerets, but some have 2 or 4.
    - Silk starts as a protein liquid that hardens when it comes out of the body. Some silk threads are sticky, others are non-sticky, and still others are used for egg sacs or wrapping prey depending on the gland from which the silk originates. Silk threads stretch. Silk threads are used to catch prey. Silk threads are stronger than a steel thread of the same thickness.
  - Discuss what the spider does to catch prey and how it eats the prey.
    - Caught prey is wrapped in silk and injected with venom that dissolves the insides of the prey's body. Spiders have fangs to inject venom. Spiders have no teeth, so can't chew. They drink the dissolved insides. Most spiders eat insects and other spiders.
  - If you walk through a silk strand or see one hanging, discuss ballooning.
    - Spiders sometimes use silk to travel. Ballooning is the term used to describe spider travel when the spider climbs up high and releases silk that catches a gust of wind and takes the spider to a new location. Spiderlings often do this to find a new location. The spider stands on tiptoe, points its abdomen in the air, and releases one or more silk threads.
  - If you see a daddy long legs, point out that it is not a spider, because there is only one body part. The true name for this animal is Harvestman. It does not have venom or silk glands. Some students may say that the daddy long legs is venomous. The true daddy long legs spider with two body parts (common to western US) does have venom (see background information).
  - Conclude your walk by discussing the types of webs you saw most and least, how many spiders you found, were they mostly in certain webs.

### Sources

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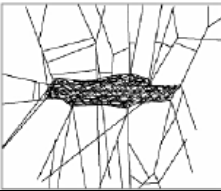
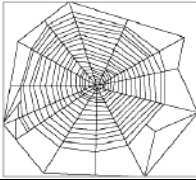
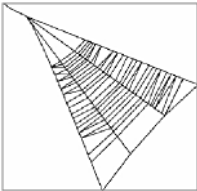




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## Spider Web Hunt – Grade One

Name: \_\_\_\_\_

Kind of Web	How Many I Found	Place a $\checkmark$ if the spider was home.
Sheet web 		
Orb web 		
Triangle web 		
Tangle web 		
Funnel web 		

In science, we discuss traits that animals have to get what they need from the environment. In math, we learn to organize information and answer questions about the information. Today our class took a walk to find and count spider webs. We learned that different spiders make different types of webs and talked about the special traits of spiders that help them live. Does your child recall some of the special body parts or behaviors of spiders? Email [granny@grannysgardenschool.org](mailto:granny@grannysgardenschool.org) to join our next gardening experience!