Lesson Title and Summary

Spiders

The children will make a snack in the shape of a spider, hear a story, learn spider facts including spiders help control garden pests, and do a worksheet/acrostic poem with the letters in spider.

Learning Goals/Objectives (measurable outcomes)

**Learning goals:** To learn about spiders: spiders are not pests, but helpful in the garden; they should be treated with respect and left alone; most spiders are harmless to humans.

**Objectives:**

- The children will know that spiders are not insects and be able to identify the main differences between spiders and insects. (Spiders: 8 legs and no wings and 2 main body parts.)
- The children will know that spiders are “beneficials,” helpful in the garden.
- The children will know that spiders that are harmful to humans are not garden spiders.
- The children will be able to identify the 3 types of ways that spiders capture their prey: web spinners, hunters and ambush spiders.

Target Grade(s)/Age(s) and Adaptation for other Grades/Ages

**Grades 1-3** (for classroom presentations, omit the grape spider or make one larger spider while the children are watching from 2 round fruit such as apples or peaches).

**Adaptations for younger children:** Omit most of the facts, shorten lesson plan/time, have enough adults help each child with the grape spider, do the fact worksheet/acrostic poem together.

**Adaptations for older children:** Omit the storybook and grape spider, have children draw a diagram of a spider (fold paper in half and have children draw a spider diagram before the lesson, then on the other half of the paper draw another diagram after the lesson; compare what they already know about spiders and what they learn), discuss more details of spider facts, show diagram of spider body parts.

Lesson Time

45 min. including making grape spider, story, acrostic poem, 35 minutes without grape spider.

Preparation, Space Requirements, Personnel needed, Supply List

**Supplies:** Spider fact worksheet/acrostic poem, optional per person snack: 2 grapes, 9 very thin celery strips and 8 sesame seeds or sunflower seeds (eyes), 1-2 toothpicks. Optional or for older children: 2 additional sunflower seeds (fangs), 2 additional thin celery sticks (pedipalps), 1-6 celery strings (silk).

**Preparation:** Check *Diary of a Spider* book out of library and mark pages to read, gather pictures of spiders, prepare grape spider materials.
Lesson Plan

Intro/Engage the Students: (20 minutes, song, optional snack, riddles, and story, 10 minutes less without snack)

1. Sing the “Itsy Bitsy Spider”
   
   The itsy, bitsy spider, climbed up the water spout.
   Down came the rain and washed the spider out.
   Out came the sun and dried up all the rain,
   So the itsy, bitsy spider went up the spout again.

2. Snack: make a spider
   (demonstrate)- body, 2 grapes (smaller Cephalothorax and larger abdomen, toothpick to hold together and to poke holes into grape for other body parts); legs, 8 thin celery strips on thorax, not abdomen (eight legs with six joints on each); eyes, 8 sesame or sunflower seeds;
   Optional: fangs, 2 sunflower seeds, ‘pedipalps’ 2 short celery strips-break on strip in half (beside fangs which helps hold prey while the spider bites it) (legs, eyes, fangs, and pedipalps are on thorax); spinnerets for silk, 1-6 celery strings (on abdomen).
   How different from insects (leg #, no wings, no antennae, have fangs, spinnerets to spin silk)

Facts about spiders to reference for spider making: Spiders have two body segments. The front segment is called the Cephalothorax. The spider’s eyes, mouth, fangs, brain and the glands that make the poison are on this part of the body. The legs are connected to this part, as well. Spider’s legs are covered with many hairs. These sensitive hairs pick up vibrations and smells from the air. Spiders have 48 knees. Yup, count them…eight legs with six joints on each.
Spiders also have these tiny little leg-ish things called ‘pedipalps’ (picture) that are beside the fangs. They help to hold prey while the spider bites it.

Most spiders have eight eyes (picture), but some have less, and some who live in very dark places such as caves, have no eyes. Spider eyes are not compound eyes like insects’ eyes.

The second part of the body is called the Abdomen that has the stomach. The spinnerets, the silk producing glands, are, on the back end of the abdomen; there are usually 6 spinnerets which make the spider’s silk.

3. Sing “Itsy Bitsy Spider” again as snack is cleaned up

4. Riddles:
   What do the spiders call the spider who builds the best web? The web master.
   What kind of cameras do spiders use? Web cams.
   How are spiders like tops? They are always spinning!
   What do you call two young married spiders? Newly webs!

5. Story: The Diary of a Spider by Doreen Cronin (selected pages, March 1, 29, April 1,12, 13, 17, May 7, July 9, 16, 17, August 1.
1. **Questions about spiders:**
   - **What do you know about spiders?**
     - **Are spiders insects?** (no, many people think that spiders are insects but they are mistaken since insects have six legs and three main body parts, insects have antennae, most insects have wings. Spiders or Arachnids are creatures with two main body parts/body segments, eight legs, no wings or antennae plus they are not able to chew. Spiders have jaws and teeth, but can not chew, they poke their fangs into the insect and shoot poison into it, which turns its guts into liquid, the spider then sucks out the liquid.
   
     - **Think before you answer…Are spiders garden friends or pests?** A garden friend eats garden pests and a garden pest eats the plant that I am trying to grow.
   
     - **Are most spiders dangerous to humans?** No, most are harmless as their venom is too weak to hurt us, except what spiders can hurt us? Black Widows (can easily recognized by a bright red hourglass shape on stomach, but even black widow are beneficial to the garden, they eat cockroaches and crickets. Black widows usually live in dark places like woodpiles and are not found in our area. Brown widows (it has an orange or yellow hour glass shape) and the Brown Recluse (it likes warm, dry places, they usually run and hide if they hear someone coming) are also poisonous, but they too are not usually found in the garden. Plus they are not usually found in our area.

2. **All spiders are predators** and many will eat other spiders. **There are three main groups of spiders:** those that spin and sit in webs to catch their prey; those that are very active, hunting or foraging for prey, and often running it down; and those that sit still and “ambush” prey when it comes too close.
   
   - **Many spiders will build webs** to catch prey such as Orb-Web or “garden” spiders (picture). These webs look like bike wheels and are very sticky. These are the webs that trap insects for food. Many of these spiders will build new webs every night. Others will just keep repairing their damaged webs. The spider will sit near the center and will weave fancy looking webs. Scientists think that the patterns help birds to see it and avoid flying into it. Garden web builders are perhaps the least threatening to people because they are fixed in a location and not likely to surprise anybody (except for the unfortunate winged insects that get caught in the web). Most often seen in late summer and autumn, orb-weaving garden spiders spin their prominent, and sometimes large, webs in bushes and on buildings, fences, and the like, catching and feeding on any winged insect that gets trapped.
   
   - **Another type of web is the sheet-web.** This web is spun horizontally and has special non-sticky lines above it. These lines knock insects down onto the sheet-web where they get stuck.
   
   - **Some other spiders spin funnel-webs.** These webs are shaped like…you guessed it…funnels. They are wide at the top and get narrower as they go down. The spider hides at the bottom of this web waiting for its prey.
• All of these webs are designed to catch food. Since spiders do not have great eyesight, they usually use the vibrations of the web strands to locate their prey. When they do, they rush over and wrap their victim in silk, turning it around and around until it is covered. Then the spider pokes its fangs into the insect and shoots poison into it, which turns its guts into liquid, the spider then sucks out the liquid. Yuck!

• Spiders that don’t make webs are **hunters** and they have other ways of getting food. **Hunting spiders** patrol backyards constantly searching for prey. Others will chase their prey. These spiders have good eyesight and can spot their victims at long distances. Some species specialize on ground-living prey, others roam over plants and trees, while others prefer to hunt on structures like fences and buildings. **Jumping spiders** (salticids) are small to medium–sized spiders (1/4 to 1/2 inch long) that jump and pounce on their prey. **Jumper spiders** use their silk as a safety line in case they fall when jumping to catch prey, **other spiders** silk to hide behind, **many garden spiders** spin webs to catch their prey and then use their silk to wrap their catch.

• They are commonly found in Pacific Northwest gardens. All hunting spiders devour a great number of insects every day. Hunting spiders have a very strong, fast acting poison and sharp fangs that can kill insects much bigger than themselves.

• **Ambush spiders** are masters of disguise, quietly waiting for prey to come to them. Some are well camouflaged and wait for their prey to pass by unaware. Some spiders spit silk to catch their prey. These spiders have good eyesight and can spot their victims at long distances. **Crab Spiders** (1/4 to 1/2 inch long) can change their color to match whatever their surroundings are. Some sit on leaves waiting for an insect to land; others hide and in flowers and wait for insects seeking nectar or pollen.

3. **Some facts** (main facts are in bold, choose a few facts you will discuss depending on age group and interest).

• There are over **34,000 different spider species** all over the world. There are more than 800 species of spiders in Washington State, and the **average pesticide-free garden is likely to be home to 20 to 25 species**.

• **All spiders have fangs!** And, yes, they almost all have **venom** in them. Lucky for us, most spider poison will not harm people because it is quite weak. Most spiders use their venom to paralyze its insect victim long enough to devour it. For other spiders, their poison is strong enough to kill their prey. Of course, this also comes in handy when being attacked by a predator. There are a few spiders with poison strong enough to cause pain or even some nerve damage in humans. These spiders include the Black Widow and the Brown Recluse spiders. If left untreated, death could result. **None of the deadly spider species live in western Washington and none are garden spiders**. People usually associate Tarantulas with the people-killing kind of poison. This is untrue. They have small poison glands with venom not strong enough to kill a human, a bite will be about as painful as a hornet or bee sting. **Tarantulas are found in rainforests and jungles.**

• **All spiders produce silk but not all spiders spin webs.** Silk is used for climbing, to create webs, to build smooth walls in burrows, build egg sacs, and wrap prey. Where does it come
from? Most spiders have four or more openings, or glands, on their abdomen called spinnerets. When the spider releases the silk, it looks like one thread but it is actually many thin threads that stick together. As soon as this liquid silk hits the air it hardens. Did you know that spiders will recycle their silk? They eat up what isn’t useful anymore and start over with fresh silk. The spider’s body has an oil on it to keep the spider from sticking to its own web.

- **Spider legs aren’t just for walking.** They’re for sensing. Each leg is covered with special hairs that can feel vibrations or can sense smells. The pedipals besides the fangs also have special hairs that sense smells.

- Spiders do not have a skeleton inside their bodies. They have a hard outer shell called an ‘exoskeleton’. Because it is hard, it can’t grow with the spider. So young spiders need to molt *(picture)*, or shed their exoskeleton.

- **Spiders can’t chew or swallow so how do you think they eat?** They can only eat liquid lunches! To do this, they inject their prey with poison using their fangs. The poison turns the insides of insect to a watery goop and the spider just sucks it up. The insect will often look normal…except that the body is empty! Web-spinning spiders will wrap their prey in a web and then crush its body with their teeth. They then pour digestive juice over the body and liquefy it. Perfect for sucking it up!

- Spiders will lay between 2 and 1000 eggs, depending on the species. Almost all female spiders protect their eggs by making a silk ‘bed’ and then covering them with a silk ‘blanket’. She then wraps them in more silk to make the egg sac. She hangs the sac someplace safe and guards it until the babies hatch. When the babies hatch they often stay inside the sac to finish developing. Some mother’s stay until the spiderlings leave the sac, others will either leave or die before seeing their babies.

- Are Daddy Long Legs spiders? Closely related to spiders, harvestmen (known as daddy-long-legs) are common in gardens. Daddy Long Legs are NOT spiders, or even insects, at all. They are part of the Arachnid family but in a different class. Harvestmen have 3 body sections, not two like spiders, and their legs have seven sections which they can break off to surprise or distract a predator. Their body may only measure 1/4 inch, its legs may stretch from 1 to 1½ inches long. The story that harvestmen are the most venomous animals in the world is a myth—they contain no venom and they are unable to puncture human skin. Most species are omnivores feeding on small insects and mites, as well as plants, fungi, and dead organisms. Although they don’t control pests as well as spiders and mites, they do play a small role in pest control in gardens.

**Reflection/Review: (15 minutes)**

1. **Questions** (3 minutes):
We (humans) are also enemies of spiders. Besides stepping on them, the pesticides we use to control other insects can kill spiders. Plus we sometimes walk into their webs and destroy the web. **How can we be less of an enemy to spiders?**

**What should you do if you see a spider?**
How many of you think you should kill it?
Leave it alone?
If inside, maybe put it in a container with a lid and take it outside and let it go.

**Do all spiders spin webs?** No. Can spiders make silk? What for? (webs, tether lines, egg sacs, doors or soft walls of their burrows, to hide behind to wait for prey.
Do the spiders that can kill humans live in our area? (not usually and not garden spiders)

**What are the three main ways spiders get their prey?** Building webs for insects to fly into, hunting and ambush.

2. **Spider fact worksheet/acrostic poem.** (12 minutes) Discuss facts on worksheet and then each child make an Acrostic word poem using the letters in spider for the first letter of each word.
(example: S spins webs, P predator, I not Insects, D do good, E eight legs, R remove pests).

Spiders generally evoke negative emotions in people, but we should truly be grateful for their presence in your garden. The pest control service that spiders provide is enormous and greatly under-appreciated. **We can be thankful for spiders because they eat garden pests, they are a natural pest control!**

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[http://www.kidzone.ws/lw/spiders/activities.htm](http://www.kidzone.ws/lw/spiders/activities.htm)


**Key Words:** Spider, Arachnids, beneficial, garden pest.

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