

Ages:

5 to 10

# Ballooning Spiders

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**Main idea:** How spiders disperse.

**Objective:** Take a look at spider, and learn about its airborne dispersal.

## **Materials:**

- q A spider egg case to examine
- q package of seeds (carrot works well) (represent baby spiders)
- q bag of feathers (from craft store)
- q sewing thread
- q scissors to cut thread, and trim feathers if wanted
- q glue (fast drying, or nail polish)

**Motivator:** You get to design and make a “parachute” for your baby spider (seed) to fly away with.

**Questions:** What would happen if we just put our seeds (spiderlings) into the jug, turned it upside down in the room, then opened the cover?

Test your theory:

- q What happens if we take this jug outside and do the same thing?
- q What would make a difference? (Wind or no wind. Gravity pulls the seed down.)
- q How can we help our spiderlings travel further? (Let them climb up on something and jump off, make a parachute to carry them further, etc.)
- q What other ways might spiders move away from the egg case as they hatch? (Walking, hitchhiking on a seed, leaf, etc.)
- q Why would spiderlings want to move away from the egg cases once they hatch?
- q (Spiders are predators, often feed on anything of the correct size that moves, would eat each other.)
- q How can the mother spider help her young even though she will not be there when they hatch? (Place the egg case in a place where it will be protected, but the spiderlings will be able to tumble out, move away quickly when they do hatch.)

**Activity:**

1. Each person gets a seed, and two pieces of string about 10 inches long.
2. Place a drop of glue on your seed, and lay the two pieces of string so that the middle of the strings cross on the drop of glue on the seed (an “X”). Let the glue dry.
3. Each person is to choose a feather which will be the parachute their seed will use. Attach the other ends of the string to the feather (glue, or tie them on). If you would like to cut your feather

into a certain shape, feel free to do so.

4. When a breeze blows have everyone line up on a line, and at the count of 3 try out their parachutes.
5. Measure the distance from the line that each person's "spiderling" dispersed.
6. Ask these questions: For the people whose moved the farthest, why do you think yours ballooned further than others in this experiment? What shapes seem to move the furthest?
7. Have the students practice the vocabulary using the word puzzle sheets.

## **Background:**

Read section where eggs hatch and young tumble out from *Charlottes Web* by E. B. White to the class, or remind them that they may know about this book and have read it or seen it on television.

Many spiders produce eggs in the fall of the year and they are wrapped in a silky cocoon, the egg case. The eggs are first stuck to a silk platform (as many as 200 in some instances), then covered with silk threads. Later, they are wrapped in loose silk, with a final layer of dense colored silk on the outside. The egg case is suspended in place by lines of silk that hold it safely through the winter. In the spring the eggs hatch and the transparent spiderlings move out from the egg case. The spiderlings soon get hungry and would start to nibble on each other if they all stayed with the egg case.

When the young spiders are ready to disperse they start "ballooning." They release silk lines that the wind lifts along with the spider and floats it off to a new area. This is somewhat like a kite or a parachute. The spiderlings get carried off in all directions, and land when the silk breaks or the breeze stops blowing.

Sometimes masses of ballooning threads can be seen in the air. How many of the spiderlings landed the same distance away? They might be eaten by one another until only one or a few remained.

Older spiders may use ballooning also. However, because their bodies are heavier, they will require stronger breezes to get them airborne. One spider expert described seeing a spider while he was taking a bath one day. “It came falling down and looked as if it was going to drop right into the tub. But when a few inches above the water surface, it stopped, then seemed to quickly climb back up the thread to the ceiling. The spider did this three or four times before finally settling on the ceiling.” If a breeze had been present, the spider could have been carried for some distance.

Spider silk is a protein with amazing properties. It can stretch to almost double its length before breaking and when compared to a steel wire of the same diameter, it is stronger. Many spiders recycle silk by eating their old silk before rebuilding a new web.

For most spiders, silk is important and used on a daily basis. There are at least seven types of spider silk known. Silk is used for lining burrows, protecting the eggs, catching prey, used for draglines which spiders leave behind as they move about, attachment disks for the web lines, and sticky silk for catching prey.

Some insects use a similar method of dispersal. The caterpillar of the gypsy moth is one. The tiny caterpillars are lightweight, very hairy, and they spin down on silken threads from a leaf, then when a wind comes along, the caterpillar is picked up and transported to a new area. The hairiness helps keep these small caterpillars airborne for a long period of time. The green inchworms also spin down on silken threads and may be carried some distance by wind for short distances. .

## **Vocabulary:**

**Arachnid:** An invertebrate animal that has two main body sections and 8 legs, no antennae.

**Ballooning:** A method of flying through the air held up by strands of silk.

**Dispersal:** Moving away from a center or source.

**Egg sack or cocoon:** The sack the spider places its eggs in.

**Order:** A group of related organisms.

**Predaceous:** Feeds on other animals. (For spiders, often insects or other arachnids.)

**Spider:** Order Araneida of arachnids. Has two main body sections, 4 pairs of legs, and two or more pair of spinneretes for making silk.

**Spiderling:** Baby spider

## **Extensions:**

- q Have people put their names on their creations and fly them on a day when there is a gentle wind, a strong wind, when it is raining lightly, and find out what happens in each instance.
- q Ask students to do the experiment again, using the knowledge they gained from the first set of data. In other words, to refine their “ballooning” spider so that it will travel a different distance.
- q Have some try cutting their feathers into various shapes. Have some use feathers upside down, some right side up.
- q Have a discussion about how other animals and/or plant disperse. Look for some examples and bring some in for the group to view.
- q Watch a real spider egg case, and if you are lucky enough to see the young hatch find out

how they disperse and how far they go.

- q For young children a pinata might serve as the spiders egg case, and they can help the spiderlings (treats) burst out of the case with the use of a stick. Do they all come out at once? (Sometimes you need to continue to help them out by hitting the pinata again.)
  
- q Have the students read and learn about other types of spiders. Where do they put their eggs and how do the young disperse. For example, what does a wolf spider do?
  
- q Learn more about spider silk. Explore the Internet for more information.

[Spider Sheet](#)

[Spiders Sheet](#)

# SPIDERS

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E	I	G	H	T	L	E	G	G	E	D	B
K	W	B	F	M	A	R	S	W	Q	S	A
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Q	N	E	T	D	S	E	I	E	O	H	O
C	R	B	E	N	R	P	J	N	Z	C	N
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W	O	D	I	W	K	C	A	L	B	U	N

ARACHNID  
BOLA  
FANGS  
PREDTOR  
SPIDERLING

BALLOONING  
EGGCASE  
FISHING  
SILK  
TARANTUAL

BLACKWIDOW  
EIGHTLEGGED  
ORB  
SPIDER  
WOLFSPIDER

LEVEL 1 NO LETTERS SHARED

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D V D Z M J M C Y Z P B  
E R E D I P S E U P R A  
G F A N G S S I L K E L  
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E A R A C H N I D B R O  
F I S H I N G R Z X C M

ARACHNID  
BOLA  
FANGS  
PREDTOR  
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BLACKWIDOW  
EIGHTLEGGED  
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SPIDER  
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