

# SPIDERS: THE WEAVERS AND STALKERS AMONGST US



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They may be tiny, but like us, the life of a spider is filled with lots of drama! Spiders have to decide where to build their webs and find food, how to escape their enemies, find potential mates, and take care of their young ones. Intrigued? Discover the fascinating world of spiders with us.

Spiders evoke many feelings in us – fear of hairy, 'creepy', eight-legged tarantulas; shudders at cobwebs that need to be cleaned periodically from homes; or excitement at the Marvel comics hero, Spider Man, who shoots silk from his wrists and saves many lives!

## So, what is a spider?

Spiders belong to a large group of animals classified as arthropods (Greek: *Arthro* = jointed; *poda* = legs) with eight legs,

and two fangs to inject venom to stun their prey. Some of their closest relatives include scorpions, whip scorpions, mites, ticks, and harvestmen.

Known for their immense species diversity, spiders are found almost everywhere in the world (except Antarctica), and in every type of habitat. So far, scientists have been able to discover more than 45,000 different species of spiders from across the world. More than 1400 of these species, belonging to 59 families, are found in India

### Box 1. How strong is spider silk?

Spider silk is very strong – you may have even heard the phrase, "as strong as spider silk". The silk of some kinds of spiders require five times more energy to break than an equivalent volume of Kevlar (which is a synthetic fibre similar to steel). What makes spider silk this strong is its elastic, stretchy property. Over the last decade, there has been extensive work on the use of spider silk in biomedical applications.

Through genetic engineering techniques, researchers have managed to isolate the spider genes responsible for silk production, and used them to produce spider silk in bacterial and mammalian cells. Scientists are now trying to mimic the silk of spiders to produce artificial silk. Spider silk is also being used in modern medicine as a natural polymer to help regenerate neurons and cartilage.

itself. While these may seem like huge numbers, most naturalists and spider taxonomists seem to think that there are far more spider types that we don't know about yet. In fact, many areas of the world are yet to be sampled for spiders, and there are so few of us who are out in the field looking for them! Little wonder then, that new species of spiders are continually being discovered from different parts of the world. Once they are discovered, classifying these spiders into different species is also quite a challenge! Interestingly, arachnologists (the term used to refer to those who study spiders) identify and group spiders based on an examination of their genitalia.

## Gossamer threads and silken yarns

All spiders produce silk. But they are not the only animals capable of producing silk. Many insects, including the silkworm, have the ability to do so. However, hardly any insects use silk for as many different functions as spiders do. Spiders use silk not only to build their webs, but also to act as their safety and harness lines to get from one place to another. They also use their silk to build protective, cushiony shelters to rest and avoid predators; to sense males from females through gender-specific chemical cues; and to protect their egg sacs.

Spider silk is made up of a complex mixture of proteins (known as spidroin), with some additional lipids, sugars or pigments (see **Box 1**). It is stored in liquid form in silk glands, located at the

### Box 2. Do spiders get stuck in their own webs?

Unlike their prey, spiders can actually walk on their own webs without getting stuck in them. This is because a spider web consists of sticky and non-sticky parts. Spiders 'tiptoe' around the sticky parts, avoiding them through a series of clever, quick movements, helped by the hundreds of dense hairs on their legs that are covered with a special non-stick coating.

rear end of the spider's abdomen. A silk gland functions and looks like a balloon with a long duct that ends in a tiny nozzle (called a spinneret). Once secreted, the liquid silk solidifies as soon as it makes contact with air. The spider, then, uses its various pairs of legs to pull, draw and comb the silk that is secreted from the spinnerets. So, as you can see now, Spider Man shooting silk from his wrist is not really correct. Spider silk has another interesting property – it has an acidic pH, making it immune to bacterial and fungal attacks!

Depending upon the purpose for which it is used, the strength and thickness of the silk that a spider may need varies. Consequently, spiders have at least six different types of silk (and silk glands), with each type used to perform one among the many different functions mentioned previously.

## Spinners and Stalkers—the different kinds of spiders and where to find them

Based on how spiders catch their prey, we can classify spiders into two broad groups – those that build webs to hunt for their food; and those that don't. Spiders that don't build webs use other methods – like actively stalking, or sitting still and camouflaged – to hunt and capture their prey. One of these types of spiders even spits a glue-like substance to stun and capture its prey!

**(a) The Spinners:** Depending on the group or family they belong to, **web-building spiders** build various types of webs to catch their prey (see **Box 2**). Some build wheel-shaped webs (also known as orb webs) or webs which resemble mini tents (called tent webs); while others build webs that look like delicate sheets, particularly prominent after a dewy morning (refer **Fig. 1**). Still others build webs that look like a messy mass of lines (like in the cobwebs we often find in our homes) with no clear pattern.

Often, just by looking at them, you can distinguish basic and simple webs on

**Fig. 1. Types of webs.**



**(a) An orb web.**

Credits: Sara. License: License: Commissioned and copyright image used with permission.



**(b) A tent web.**

Credits: Dinesh Valke, Wikimedia Commons.  
URL: [https://commons.wikimedia.org/wiki/File:...\\_web\\_--\\_tent\\_spider\\_web\\_\(4305043541\).jpg](https://commons.wikimedia.org/wiki/File:..._web_--_tent_spider_web_(4305043541).jpg).  
License: CC-BY-SA.



**(c) A sheet web.**

Credits: James K. Lindsey, Wikimedia Commons.  
URL: <https://commons.wikimedia.org/wiki/File:Linyphia.hortensis.web.jpg?uselang=en-gb>.  
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### Box 3: The spider's signature:

The signature or cross spider is an orb-web spider that sometimes incorporates white, zigzag, silken structures as part of its web. These structures are called **stabilimenta**, based on a long-disproved theory that they give 'stability' to the web. According to one hypothesis, these structures are used to reflect ultraviolet light (UV), which (although invisible to humans) attract many species of insects (spider food) to the web. Another hypothesis suggests that the stabilimenta are used to protect the spider against its predators by either making it look bigger, or by deterring predators (like birds) from destroying the web structure.

Some, more recent, theories suggest that these 'signatures' may be used as signals by a female to indicate to a male that she is ready to mate, or simply because they are a nice decoration!

**Fig. 2. A cross spider (ventral side).**

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the one hand, and very complicated and elaborate structures on the other (see **Box 3**). The simple ones (like the basic orb webs) are made afresh everyday, or sometimes, every few days. In some cases, depending on the extent of damage, older webs may either be recycled or repaired. In contrast, the more elaborate webs like the tent and sheet webs, that require a great deal of energy and resources to be built anew, are repaired more often than they are rebuilt.

**(b) The Stalkers:** Spiders that do not build webs to catch their prey are called **hunting spiders** (refer **Fig. 3**). Many hunting spiders actively move around looking for their prey. In contrast, spiders that are more sedentary, use stealth and camouflage (like the crab spider) as hunting techniques. Since this group of spiders does not use webs to capture insects, they depend on visual or vibrational cues to find and hunt their prey. Consequently, active hunting spiders (like, the jumping spider and

wolf spider) tend to have better vision than their more sedentary web-building relatives (see **Box 4**).

### I am bigger than you!

Male spiders are often smaller than female spiders (refer **Fig. 4**). In some species, like the Giant Wood Spider, the female can be almost 3–5 times the size of the male! Apart from a difference in size, mature males can be distinguished from females by the presence of enlarged bulb-like palps, used to store their sperm.

Once a male spider reaches maturity, he either builds a temporary shelter or wanders in search of a potential mate. Even when he does come across a female of his species, the male has to carefully plan a strategy to get her attention. If the female mistakes him for prey, it's likely that she'll pounce on him and wrap him up like she would wrap an insect! If he belongs to a family of web-

building spiders, the first thing the male does is to announce his arrival to her using a particular plucking motion which he strums on her web. If this plucking motion is even slightly inaccurate, he may end up becoming her next meal! Males from hunting spider families may not have webs to strum on, but they've evolved various kinds of courtship rituals that would make even a hero envious. These include strategies like moving their legs in elaborate swaying and dance-like movements, or presenting a wrapped-up dead insect to the female to distract her while he mates with her. Also, the males of these spider species are often very colourful, since they use a lot of visual cues to attract a potential mate.










### Here an eye, there an eye, everywhere an eye eye?

Some spider experts group and classify spiders by the number and arrangement

# Life in the Outdoors

## SPIDER BINGO

Break out into groups and look for these outdoors. If you find any three of these spiders down or across – say BINGO!

<p><b>Camouflaged spider</b></p>  <p><small>Credit: Brian W. Bowers (CC BY) https://www.flickr.com/photos/bwbo/20414100/ License: CC BY-SA</small></p>	<p><b>Jumping spider</b></p>  <p><small>Credit: David E. Williams (CC BY) https://www.flickr.com/photos/davidewilliams/20414100/ License: CC BY-SA</small></p>	<p><b>Spider on a flower</b></p>  <p><small>Credit: David E. Williams (CC BY) https://www.flickr.com/photos/davidewilliams/20414100/ License: CC BY-SA</small></p>
<p><b>Ant-mimic spider</b></p>  <p><small>Credit: Katherine E. Zinner (Copyright: used with permission)</small></p>	<p><b>Spider with egg-sac</b></p>  <p><small>Credit: Ian W. Hoggan (Flickr Commons) URL: https://www.flickr.com/photos/ianw/20414100/ License: CC BY-SA</small></p>	<p><b>Spider food</b></p>  <p><small>Credit: David E. Williams (CC BY) https://www.flickr.com/photos/davidewilliams/20414100/ License: CC BY-SA</small></p>
<p><b>Many spiders on a web</b></p>  <p><small>Credit: Brian W. Bowers (CC BY) https://www.flickr.com/photos/bwbo/20414100/ License: CC BY-SA</small></p>	<p><b>Spider on a web</b></p>  <p><small>Credit: Brian W. Bowers (Copyright: used with permission)</small></p>	<p><b>Spider in leaf litter</b></p>  <p><small>Credit: Tom Fildes (CC BY) https://www.flickr.com/photos/tomfildes/20414100/ License: CC BY-SA</small></p>

Source: Adapted from Nature Conservation Foundation's nature education material on birds and trees.

## OBSERVE SPIDER WEBS

Find a spider web – in your classroom, home or outdoors! Take a few minutes to observe it.

### Illustrate and describe your web

1. Is it simple or complex? Is it vertical or horizontal, symmetrical or messy, funnel or tent shaped? If the web is not clearly visible, gently spray some water with a water spray for better visibility.
2. Where did you find the web (on the ground, on a plant, inside a house)? Are there any patterns between the kind of habitat you found it in and the kind of web built? For example, have you noticed that funnel webs are always built on the ground amidst grasses and shrubs? Or that orb webs are built higher up on a plant, where there are gaps between two branches?
3. Can you spot a spider in the web? If yes, where is it and what is it doing?
4. If it's a simple web, try and observe the spider when it starts building its web early in the morning, or towards dusk. How long does it take to build the whole web? And can you describe the process it follows to build it? Check with your friends to see if all web building spiders follow the same process and time?
5. Are there other things on the web? Other spiders, insects or debris, twigs, leaves?



You will need:



Bottle with a spray nozzle



Pencil



Paper

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**Box 4. Why do hunting spiders have better vision than web-building spiders?**

Ask your students this question and discuss possible reasons with them. Then, show them images focusing on the eye arrangement of four types of spiders. Based on your discussion, ask them to guess if these eyes belong to a web-building spider or a hunting spider?

of eyes in their head region. Most spiders have eight eyes, but some have six eyes or fewer. However, unlike the compound eyes of insects, spider eyes are simple and similar to our own or those of other mammals.

Most web-building spiders navigate and capture prey using vibrations on their webs; their eyes can barely detect light-dark intensity changes and movements. In contrast, the more active hunting spiders, such as jumping spiders, wolf spiders, net-casting spiders and crab spiders, have much better vision for distinguishing prey, mates and predators.

The vision of one group of hunting spiders, called the jumping spiders, has been studied extensively. These fairly common (even around our homes), small, and often colourful spiders get their name from the way they move around, and stalk their prey (refer Fig. 5). If you get a chance to see such a spider, it is fascinating to see it hunt! Jumping spiders sense the movement of their potential prey from a distance, using six of the eight relatively small eyes located at the sides of their heads. Once they detect a movement, they turn to face the prey with their larger middle front eyes; while their remaining pairs of eyes provide information about the size, colour and distance of the prey. Next, they stalk it with cat-like movements. Once the spider is only about a few centimetres from its prey, it crouches and jumps to capture it.

### What do spiders eat?

Spiders are largely carnivorous, feeding on various insects as well as other

spiders. Web-building spiders use their strong webs to capture prey larger than themselves, including flying insects such as flies, butterflies, moths, beetles, and bees (refer Fig. 6). Spiders that do not build webs, capture a variety of insects – including mantids, crickets, ants and cockroaches – either by ambush, stealth or cleverly camouflaging themselves. But, this is not all. Spiders have also been reported to prey on millipedes, tadpoles, small frogs, fishes, geckos and even the occasional bird accidentally caught in a large web.

Spiders do not eat their food whole. They bite into their prey, injecting venom into it. This venom has enzymes that liquefy the insides of the prey that the spider then sucks up! When they catch very large prey, spiders sometimes restrain it by wrapping it up in silk. Web-building spiders often have to do this very quickly to minimise the damage that a newly caught prey can cause to their web by thrashing around to free itself (refer Fig. 7). If there's no prey in sight, hungry spiders will sometimes (see Box 5) resort to cannibalism (eating their own species if they are in close proximity) or hunting and feeding on any other spider species that they come across.

But, there's one group of spiders, called the *Portia* spiders (refer Fig. 8), which are a lot like the King Cobra in that they only seek out other spiders to feed on! That these spiders often look like a mass of dried-up debris may help them blend into the webs of the web-building spiders (with poor eyesight) that they prey on. Research has shown that the *Portia* spiders exhibit remarkably intelligent hunting behaviours, often resorting to trickery and deceit to capture spiders to feed on. For example, once a *Portia* spider reaches the web of its prey, it mimics the vibrations or movements of a struggling insect or potential mate. When the web-building spider comes to investigate that part of the web, it is promptly captured by the *Portia*. Sounds like a scene from a horror movie, doesn't it?

Much to the excitement of scientists, we now know of a species of jumping spiders, called *Bagheera kiplingi*, which is

**Fig. 3. Hunting spiders.**



**(a) A wolf spider.**

Credits: Sara. License: Commissioned and copyright image used with permission.



**(b) A jumping spider.**

Credits: Sara. License: Commissioned and copyright image used with permission.



**(c) A crab spider.**

Credits: Robin Rozario, License: Commissioned and copyright image used with permission.



**Fig. 4.** Female spiders are larger than their males.

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**Fig. 5.** A jumping spider.

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mainly herbivorous. Recently discovered from Central America, this spider's diet consists of the sugar, lipids and proteins present in the leaves of some plants.

### What creatures eat spiders?

This may seem strange, but the main enemies of spiders are other spiders! Large spiders typically eat smaller spiders, and different species of spiders eat each other. Other predators and enemies of spiders include birds, lizards, and insects like wasps and praying mantids.

In fact, some species of solitary wasps specialise in preying on spiders of various kinds – from small web-building or hunting spiders to large giant spiders like the tarantula. Research suggests that such wasps use a combination of visual and chemical cues to locate spiders. Once

## WEB GEOMETRY AND MATH

Ever observe how spider webs come in different geometric shapes?



You will need:



1. Select 4 or 5 webs that are differently shaped.
2. Compare the area and circumference of these webs (Hint: an orb web can be approximated as a circle; a tent web as a trapezium, and a funnel web as a triangle).
3. Which of these webs is or may be more efficient in capturing insects? Why?

REMEMBER:

There is trade-off for spiders that build different kinds of webs. A large orb web may help trap more insects, but is also more expensive in terms of the amount of silk and additional energy the spider needs to put into building it. Many simple orb webs are recycled (the spider ingests its web) and rebuilt every morning! On the other hand, the more elaborate tent and funnel webs are built over many days, and only the portions that are badly damaged are mended by the spider.

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## SPIDER DIVERSITY IN LEAF LITTER

Did you know that even leaf litter (fresh and dried leaves that have fallen from a tree and accumulated over time) houses many spiders and insects (spider food)?



A spider feeding on a leaf-litter toad.

Credits: Brian Grosholz, Flickr; License: CC-BY URL: <https://www.flickr.com/photos/2177314568960794/4314739/>

### REMEMBER:

To wear shoes and avoid handling spiders and insects with bare hands.

### You will need:

A piece of white cloth



Pencil

Measuring tape



Some paper



A long stick to sift leaf litter

Try and separate all the spiders you see in the leaf litter from the insects. Then, try and categorise individual spiders based on their colour, shape, legs, and behaviour.

1. Find a tree that sheds leaves or an area with lots of leaf litter.
2. Mark 2 plots - one with an area of 1m square and the other with an area of 4m square - in the leaf litter.
3. Place a piece of white cloth next to each of the marked squares.
4. Scoop and quickly place small scoops of dried leaves on the cloth.
5. You will soon see insects or spiders crawling out of the leaves and onto the cloth. Count the number of spiders and insects in both plots. Which one has more spiders and insects?



**Fig. 6. Spider prey caught in a web.**

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located, the wasp stings its prey with a paralysing neurotoxin and carries the spider's inert body to its nest. After it has collected one or more such paralysed spiders, the wasp lays an egg on one of

them. When the egg hatches, the barely alive spiders become fresh food for the wasp larvae to feed upon (refer Fig. 9). Gruesome as this may sound, it's fascinating to watch a predator like a

wasp hunt down another predator like a spider.

Spiders have evolved in many ways to escape predation. Many web-building

#### **Box 5. Social spiders:**

Most spiders are solitary predators. Often, if you put two spiders together in a container, depending on how hungry these spiders are, only one spider will be left in the container at the end of the day. But, in a few families of spiders, individuals of the same species are known to live in groups or colonies, and are fairly tolerant towards their colony-mates. These spider species are called communal or social spiders.

Social spiders are particularly interesting, as they live in fairly large colonies of ten to hundreds of individuals. They cooperate in hunting prey, building a web, and taking care of their young! Many of them also have 'personalities' – while all individuals are capable of doing all the tasks (such as hunting prey or building a web), some individuals do certain tasks more often than others.



**Fig. 7. The web of a social spider.**

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spiders hide in the corner of their webs, or inside a curled up leaf. Others, like the debris orb-weaving spiders, add web decorations that distract and confuse predators (refer Fig. 10). Some spiders, like the *Gasteracantha* (also known as the spiny orb weaver), have spiny and spiky exoskeletons that make it difficult for predators like birds to grasp them. These hard spikes are also believed to deter their parasitic wasp enemies.

## Up, up and away with the wind!

Spiders undergo incomplete metamorphosis. This means that a spider does not go through the different stages of development (from an egg, larva, pupa, to an adult stage) that, for example, a butterfly does. Instead, spiderlings (young spiders), which look like miniature versions of the adult, hatch directly from their eggs. Their first source of nutrition is some dried up yolk from their egg sacs. Soon after, they disperse via a phenomenon called ballooning (see Box 6).

Spiderlings grow by moulting (removing their old outer skin) periodically, until they become 'mature adults'. Many insects and spiders have a hard chitinous protective layer outside their body, called the exoskeleton. Like snakes, spiders cannot grow unless they are able to shed this exoskeleton, a process called moulting (refer Fig. 11). Moulting is a risky process, as spiders are almost immobile during this time, and therefore, most vulnerable to predators.

## I take care of my young

Many species of spiders are known to exhibit some kind of maternal care – from females carrying their egg sacs in their mouths for many weeks (like the long-legged house spiders), and therefore not feeding herself during this period; to having the egg sac attached to the female's spinnerets, or straddled to its abdomen (refer Fig. 12). Females of one group, known as the nursery web spiders, build elaborate silken structures, much like a nursery, to house their egg sacs and spiderlings. The female wolf spider not



**Fig. 8.** A *Portia* spider feeding on a spider it has just caught.

Credits: Sara. License: Commissioned and copyright image used with permission.



**Fig. 9.** A wasp larva on a spider.

Credits: Miller, J. A.; Belgers, J. D. M.; Beentjes, K. K.; Zwakhals, K.; van Helsdingen, P. (2013). "Spider hosts (Arachnida, Araneae) and wasp parasitoids (Insecta, Hymenoptera, Ichneumonidae, Ephialtini) matched using DNA barcodes". *Biodiversity Data Journal* 1: e992. DOI:10.3897/BDJ.1.e992, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Live\\_Tetragnatha\\_montana\\_\(RMNH.ARA.14127\)\\_parasitized\\_by\\_Acrodactyla\\_quadrisculpta\\_larva\\_\(RMNH.INS.593867\)\\_-\\_BDJ.1.e992.jpg?uselang=en-gb](https://commons.wikimedia.org/wiki/File:Live_Tetragnatha_montana_(RMNH.ARA.14127)_parasitized_by_Acrodactyla_quadrisculpta_larva_(RMNH.INS.593867)_-_BDJ.1.e992.jpg?uselang=en-gb). License: CC-BY.

# Life in the Indoors

## SPIDER TERRARIUM

You will need:



An old but useable empty aquarium/transparent plastic box

REMEMBER:

To not capture spiders with your bare hands – if they feel threatened, they may nip your fingers. Instead, try easing them into small plastic boxes with lids with small breathing holes. Also, be gentle – spiders are delicate and may easily get injured.

1. Get hold of an old aquarium. Put a thick layer of mud in it and plant some hardy, fast growing plants (placing small potted plants is also fine). You can cover the terrarium with a mesh cloth for aeration.
2. Release a few non-web building spiders (jumping spiders can be found on walls of buildings, wolf spiders can be found in a grassy patch) into the terrarium.
3. You will need to collect food for your spiders every few days. They will happily accept small grasshoppers, fruit flies or houseflies. You can catch these with a small fish or butterfly net. But, make sure the insects you are providing are alive, as spiders do not feed on dead things!
4. This setup can be kept for weeks as long as your spiders are fed. Make sure you spray the plants with water occasionally – this also serves as a source of moisture for spiders.
5. Observe and note down the hunting behaviour of your spiders. Are they active hunters or the more sedentary sit-and-wait predators? When are they most active?



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# Life in the Indoors

## SPIDER OR INSECT?

You will need:



A small pocket magnifying glass (10x will do)



2 transparent boxes or jars with holes (for air) in their lids



Paper



Pencil

- Carefully collect a spider and an insect in separate transparent jars/boxes. You can also use a dead spider or a dead insect for this activity.
- Use a magnifying glass to compare the two. How are they similar? In what characteristics are they different from each other?

Spider:



Insect:



	Spider	Insect
External skeleton?		
Antennae present?		
Wings present?		
Number of eyes?		
Body segmented?		
Number of segments?		
Number of legs?		
Jointed appendages?		

### REMEMBER

To avoid handling spiders/ insects with your bare hands. Try catching them both using small plastic boxes with holes in their lids. Also, be gentle – insects and spiders have delicate bodies and may easily get injured. Once you've finished observing the differences between the two, gently release the spider and the insect, preferably in the same places where you found them.

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**Fig. 10.** The debris orb weaver spider is well-camouflaged by a string of collected debris like twigs, dried leaves and beautiful silken decorations.

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**Fig. 11.** A spider with its moult.

Credits: Judy Gallagher, Wikimedia Commons. URL: [https://commons.wikimedia.org/wiki/File:Crab\\_Spider\\_-\\_Synema\\_parvulum\\_and\\_its\\_moult,\\_Leesylvania\\_State\\_Park,\\_Woodbridge,\\_Virginia.jpg?uselang=en-gb](https://commons.wikimedia.org/wiki/File:Crab_Spider_-_Synema_parvulum_and_its_moult,_Leesylvania_State_Park,_Woodbridge,_Virginia.jpg?uselang=en-gb). License CC-BY.



**Fig. 12.** Females of many species of spiders are known to show some form of maternal care.

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## SPIDER MYTHS AND FOLKLORE

1. Do some research online, scan some spider books and articles, or speak to some elders about spiders. Find out what spiders are called in your local language.
2. We remember our grandparents telling us that when they were young, they used to come across large hairy spiders in houses with thatched roofs! Become a journalist and record these stories. Then, create your own short story, play or poem using the information you have gathered and share it with your classmates.
3. Like lots of other animals, spiders also have been the focus of lots of mythological stories in many cultures. After doing some of your own research on spider myths, narrate your favourite myth, or even make a play and present this to your classmates and teachers.

Hindi:  
Makadee  
मकड़ी

Assamese:  
Makaraā  
মকৰা

English:  
Spider

Punjabi:  
Makari  
ਮੱਕੜੀ

Marathi:  
Koli  
कोळी

Tamil:  
Cilanti  
சிலந்தி



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**Fig. 13.** Female wolf spiders carry their young ones (baby spiders) on their backs till the spiderlings are ready to start their own lives.

Credits: Valerius Geng, Wikimedia Commons. URL: <https://commons.wikimedia.org/wiki/File:Wolfspinne1.jpg>. License: CC-BY-SA.

#### **Box 6. Ballooning spiders:**

Spiders do not have wings, and yet they are found across the world and in different habitats including islands. How do spiders manage to colonize these areas? Spiderlings do this by employing a technique known as ballooning (visualise a person trying to fly a kite). Spiderlings climb up to an elevated point, like a twig or the tip of a leaf, raise their abdomen up, and release a silken thread in a direction against that of the wind. Usually a gentle breeze is enough to lift up these minute and delicate spiderlings, carrying them to far-away places, where they start their own lives and families. The further they balloon away, the less they need to share resources with their siblings.

only carries around the egg sac attached to her spinnerets until it hatches, but also allows her young spiderlings (baby spiders) to scramble up and ride on her back. The spiderlings clutch onto the minute hair on her abdomen for many weeks before they balloon away to lead independent lives (refer Fig. 13). Ask your students if they know of any close relatives of spiders, where females of the species are similar in carrying their newly-born on their backs.

#### **Yikes! A spider brushed past me/it bit me!**

Are spiders poisonous or venomous like some snakes? Spiders are venomous, but often the venom is potent only to their natural prey. So far, no Indian spider species has been found to be venomous

to humans. However, it is best to avoid handling spiders with bare hands. Spiders can give you a nip if they feel threatened or an itch/rash from the minute hair on their bodies.

#### **Why should we care or know about spiders?**

Spiders not only share this marvellous diverse world with us and other living creatures, but also perform many essential biological functions. For example, as predators, spiders keep a check on insect populations. Scientists have used the presence or absence of certain types of spiders as indicators of change in an area. Due to its unique properties and strength, the silk produced by spiders is used in biomedical engineering and material science.

## Conclusion

Through this article, we hope that we have given you a glimpse of the interesting and sometimes bizarre world of spiders... a world that you can observe and learn from. If you look around carefully, you will start finding spiders everywhere – behind the curtains in your

house, on your school walls, on asbestos sheets, on barks of trees, under and between leaves, in the corners of ceilings and, sometimes, cheekily jumping around right in front of you! These fascinating eight-legged animals are still being discovered and named in different habitats across the world. Can you

imagine all the habits and behaviours that we are yet to discover about them? Someday you too may discover a new species of spiders, or describe some of its behavioural traits that are new to science. So keep your eyes peeled, carry a magnifying glass, and go exploring the wonderful world of spiders.



### Notes:

1. Wherever possible, we have referred to the different spiders described in this article through their commonly accepted names, instead of their scientific names.
2. If you would like to learn more about spiders, and their role and behaviour intrigue you as well, we encourage you to use the many resources (online and in books) mentioned in the reference section to find out more.
3. Pictures by Sara in this article were commissioned by Vena Kapoor as part of a project on documenting spiders in the forests and coffee estates of Valparai, in the Western Ghats, and supported by Nature Conservation Foundation and an ATREE small grant.
4. Credits for the article title and the image used in its background: Jumping Spider, ROverhate, Pixabay. URL: <https://pixabay.com/en/jumping-spider-spider-insect-macro-1130449/>. License: Public Domain.

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5. The authors' research and field observations over many years!

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