



Arachnid Art

Background:

Spiders are fascinating. These invertebrates are not insects. Instead, they belong to a group of invertebrates called arachnids. Spiders have two parts to their bodies (cephalothorax and abdomen), eight legs, and up to eight eyes and spinnerettes on their abdomens that produce silk to wrap their prey and to build a web. Both spiders and insects molt their exoskeletons to grow. Molting frequently happens early in their lives and less often as they reach adulthood. Insects have three body parts (head, thorax, and abdomen), six legs, two eyes, and no spinnerettes.

Spiders have specially designed "jaws," called chelicerae, shaped as either articulated fangs or pincers. The chelicerae of nearly all spiders are hollow and contain (or are connected to) venom glands and are used to inject venom into prey or predator. All spiders are carnivorous and venomous, but only a small percentage are potentially dangerous to humans.

Spider silk is made from chemical properties that make it strong and light. It's stronger than steel! It also has tensile strength, meaning it can be stretched a lot before it breaks. Scientists are still trying to figure out precisely what gives the silk both strength and elasticity, but they have not yet solved the riddle.

A spider is capable of making up to seven different types of silk. However, most species make four to five types. All spiders produce silk, but not all spiders spin webs. Silk is used to climb, create webs, build smooth walls in burrows, build egg sacs, and wrap dinner. For those that make webs, the web is an essential use of spider silk as it protects them from predators and helps them to catch a meal. A spider can detect vibrations when something touches the threads of the web, alerting it to danger or to prey animals that have become entangled.

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 many thin threads that stick together. As soon as this liquid silk hits the air, it hardens. Many spiders use their silk for something called 'draglines.' A dragline is a rope-like web that helps the spider climb back home if they fall or let themselves drop.



Spiders are essential to an ecosystem's health because they eat insects and other arthropods and help and help to keep their numbers in check. Scientists estimate that spiders feast annually on 400-800 million tons of insects. Think of all the insect pests you would need to combat if it weren't for spiders! Other animals also rely on spiders for food and nesting material. Hummingbirds line their nests with spider webbing to give their chicks a soft place to grow. So next time you see a spider, take time to observe it and let it safely do its job.

Materials:

- A bag to collect supplies on your nature walk
- Leaves or bark to form your spider's body
- Sticks or long pieces of grass to form your spider's legs
- Googly eyes (2 larger ones and six tiny ones)
- A small piece of paper or sticks to make the chelicerae
- Scissors
- Glue dots or Craft glue
- A piece of dark construction paper or cardstock
- A white piece of paper



Instructions:

1. Take a nature walk looking for spiders. Please spend some time observing them on their webs. You might want to sketch some of the body shapes you see to refer back to when making your spider picture.
2. After observing a spider or two, pick up fallen leaves, long strands of grass, or twigs and place them in your bag. Be sure to look before you take it to ensure no one is living under them.
3. When you return from your walk, lay a dark-colored piece of construction paper in front of you (black or blue work best).

Create Your Spider's Web.

1. Use white paper to create your spider web.
2. Take the sheet of paper and fold it to form a triangle.



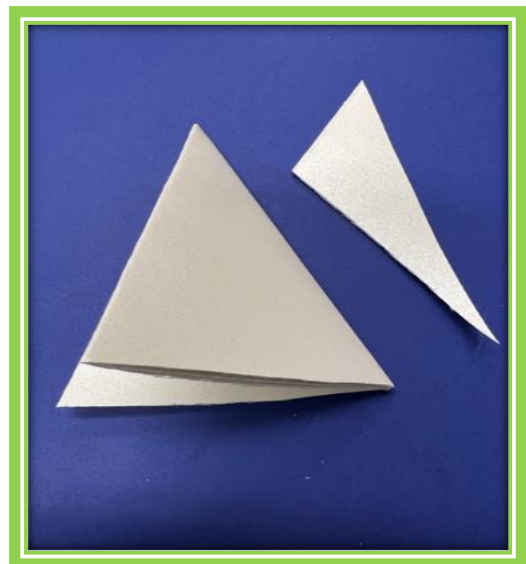
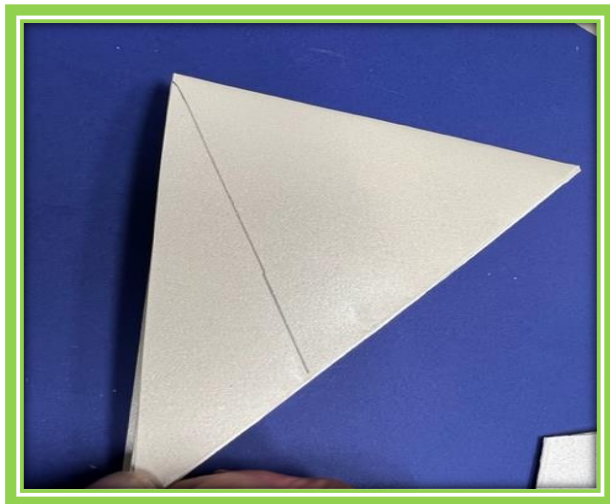
3. Cut off the remaining straight edge to form a triangle.



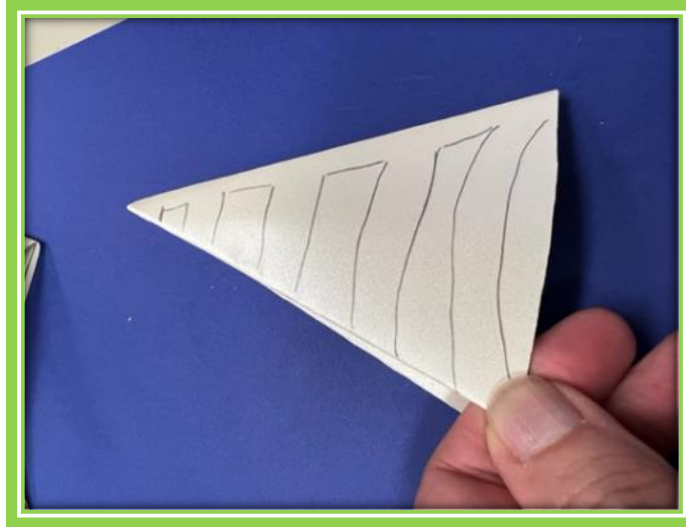
4. Fold the triangle in half and then in half again.



5. Place the fold away from you. Using a ruler, draw a line from the point on the left side of the fold across the triangle to make a smaller triangle.



6. Turn the triangle, so the fold is away from you. Using a pencil, draw your web. Make sure to start by curving the first line along the bottom of your triangle and then draw a matching line a $\frac{1}{2}$ inch away. Make sure to leave a $\frac{1}{4}$ inch of space along the fold. Continue the pattern until you reach the tip of the triangle.



7. Using scissors, cut the rectangle shapes out between the lines. Then unfold your triangles and open them to see your web. Glue your web to the dark paper.



Create Your Spider

1. Sort and separate the leaves, grasses, and twigs you collected and place them in separate piles. Pick a large leaf for the body of your spider and a smaller leaf for your spider's cephalothorax. Carefully glue them to your spider web.



2. Now, from the grass and twigs, lay out four legs for each side of your spider. A spider's eight legs attach to the cephalothorax.



3. Attach the googly eyes to the front of the spider's cephalothorax. Spiders usually have six to eight eyes: two enormous front eyes to get a clear, color image and judge distance, and extra side eyes to detect when something is moving.



4. Attach two tiny sticks or pieces of grass to the front of the cephalothorax. These are the spider's chelicerae, which it uses to inject venom into its prey.



5. Now, admire

your Arachnid Art.



Extension:

See if you can build a spider's web out of grass and sticks rather than cutting it out of paper.