

Tarantula

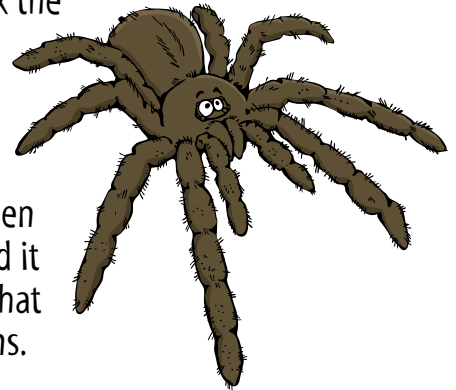
This Project Really Sucks!

What you'll need!

- Glass jar and lid
- Hammer and nail
- Drinking straw
- Modeling clay
- Water or juice

Tarantulas don't really suck the life out of their prey, they more or less just eat up their innards.

Nevertheless, sucking is a pretty important thing when you drink from a straw, and it demonstrates a principle that is important to all life forms.



What you do:

1. Make a hole (big enough for the straw) in the metal jar lid. The easiest way to do this is with a hammer and nail. Ask an adult for help with this. You'll need a nail that is at least as wide as the straw.
2. Fill the jar half full of water, or any other liquid you care to drink and put the lid on tightly.
3. Stick the straw into the liquid through the hole in the lid.
4. Plug the spaces between the straw and jar lid with clay, so no air can get in. (It MUST be airtight.)
5. Now, the fun starts. Suck away. Or try to.



Ask yourself

- Were you able to get any liquid through the straw?
- Why do you think this happens?
- What could you change in order to drink through the straw?
- How does air affect the amount of suction you need?

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What did you find out?

I bet you want to know what's going on here, don't you? Usually, when you use a straw, the container is not airtight and the drink is open to normal air pressure. That's why the lids on milk shakes are so flimsy. Sucking on a straw creates low pressure inside of your mouth. The normal air pressure on the surface of the liquid is, therefore much higher and the liquid travels from high-pressure to low pressure into your mouth.

In this activity, you blocked the outside air pressure so that it could not act on the liquid. As a result, no matter how hard you tried, you could not create enough low pressure to force the liquid to rise.

Spiders are required to follow these rules of physics too. For spiders, the physics actually works to help them because the bodies of insects aren't as solid as this glass jar. When a spider punctures an insect's body, the air pressure acts upon the exoskeleton and the inner, liquid slurry moves to the low-pressure area in the spider's mouth.

Eating through a straw is all a matter of physics. It really doesn't matter how big of a sucker you are, if you don't follow the rules, you'll starve.

Specific Learner Expectations (SLE)

Grade 2 Topic E Small Crawling and Flying Animals.

SLE 1-10: Describe the general structure and life habits of small crawling and flying animals; e.g. insects, spiders, worms, slugs; and apply this knowledge to interpret local species that have been observed.

Grade 6 Topic A: Air and Aerodynamics.

SLE 1: Provide evidence that air takes up space, exerts pressure and identify examples of these properties in everyday life.