

Nature Adventures Module: Why and how do fireflies light up?

(Highlighted words are found in the Glossary List)

Todd: I'm sure everyone, at some time in their lives, has wondered why and how fireflies light up.

Terri: The story of the firefly is fascinating! The explanation of how they light up and why they light up is surely complex and interesting!

Todd: Fireflies appear to light up for a variety of reasons. Larvae use their glows as warning displays to communicate their distastefulness. They don't taste good to predators! As adults, many fireflies have flash patterns unique to their species and use them to identify other members of their species as well as to determine the opposite sex. The female chooses a male firefly based on his flash pattern. Male fireflies light up to signal their desire for mates – while the females attempt to attract male fireflies with flashes of their own. The female fireflies will produce short rhythmic flashes. She will sit on the ground in the high grass to flash to certain male only. But not all the flashing of fireflies is motivated by romance. While each firefly species has its own pattern of flashing, some female fireflies will imitate the patterns of other species, and when the male firefly lands next to her, she may try to eat it alive! So in other words, fireflies flash to scare away predators, some flash to attract a mate, some do it to trick others so they can attack!

Terri: That was really interesting, Todd. Now that we know why fireflies light up, let me tell you how they light up. Fireflies contain an organic compound in their abdomens, called luciferin. As air rushes into the abdomen, it reacts with the luciferin – it's this chemical reaction that makes a firefly's light. This type of light production is called **bioluminescence**. When oxygen combines with chemicals in their body light is produced. Unlike a light bulb, which produces a lot of heat in addition to light, a firefly's light is a cold light, without a lot of energy being lost as heat. This is necessary because if a firefly's light-producing organ got as hot as a light bulb, the firefly would not survive the experience. A firefly controls the beginning and end of the chemical reaction, and thus the start and stop of its light emission, by adding oxygen to the other chemicals needed to produce light. This happens in the insect's light organ. When oxygen is available, the light organ lights up, and when it is not available, the light goes out. Cool huh?

Todd: Sure is, Terri. They are unique, fun to watch, and they are completely harmless. Fireflies do not bite, do not have pinchers, and do not carry disease. The saddest part is that they have a life span of only two months. Next time you see the glow of a firefly, think of how unique and amazing fireflies are, and enjoy its short life while you can!

Sources:

<http://www.earthsky.org/faq/bugs-firefly-light>

<http://www.thaibugs.com/Articles/fireflies.htm>

<http://www.scientificamerican.com/article.cfm?id=how-and-why-do-fireflies>

<http://www.earthsky.org/faq/bugs-firefly-light>