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Watching fireflies on a summer night is an enchanting experience that brings out the kid in everyone. It's easy to imagine that the winking lights are cast from tiny lanterns belonging to wood faeries, but the science behind what makes these beloved bugs blink is just as magical.

Fireflies are not actually flies – they're beetles in the Lampyridae family, of which all members glow. While it's believed that Canada has 29 native species of fireflies, entomologists are still learning about them and making new discoveries. Also known as lightning bugs, these little insects have elongated bodies with two pairs of wings. The forewings are hard for protection and help keep flight balanced. The soft hind wings beat fast, propelling the beetle along. Fireflies can be found near woodlands and in grassy fields, gardens, parks and other open places surrounded by trees. They thrive in wet environments, hunting soft-bodied prey like snails, slugs, worms and mosquito larvae. Some species feed on pollen and nectar, which help with pollination. Fireflies lay their eggs in the fall. The larvae spend the winter underground or beneath tree bark and emerge as adults in the spring. A wet spring can lead to an earlier emergence -- the wetter the ground, the more abundant they will be. Like other cold-blooded creatures, fireflies depend on the environment for heat. They respond to warm, humid conditions with more active light displays, while chilly stretches cause inactivity with longer lapses between flashes. The worst conditions are prolonged droughts and heat waves, which are harmful to the eggs and developing larvae.

So, how does a firefly light up? The answer is through bioluminescence -- a biochemical emission of light by a living organism. In fireflies, a chemical reaction takes place within the light-producing photic organ, located just below the abdomen. As the insect draws in oxygen, it mixes with a chemical called luciferin, found within the organ cells. There, an oxygen electron causes a chemical reaction that makes the insect light up. Super efficient cold light is produced, with almost no heat generated. Nearly 100% of the energy emitted is in the form of light (comparatively, incandescent bulbs produce roughly 10% light and 90% heat). Fireflies use their flashing lights to communicate and attract mates. It is thought that most, or all, species have their own unique flashing pattern. Females of some species imitate the patterns of others to lure in males and then devour them in a form of aggressive mimicry. The light also deters predators, as fireflies contain a chemical that makes them taste bad. Once predators experience the noxious taste, they learn to avoid them. In an amazing phenomenon called simultaneous bioluminescence, Synchronous fireflies flash together at the same exact time. This only occurs in two places worldwide: the Great Smoky Mountains National Park in Tennessee and in Southeast Asia.

Firefly populations are in decline due to habitat loss and deadly pesticides. There is also emerging evidence that light pollution is having a harmful impact, as the growing amount of artificial light we create seems to disrupt the way they communicate. Help support fireflies by providing both living trees and deadwood on your property and by creating areas with taller grasses or plants. Avoid pesticide use. Also, turn off as many lights as possible at night and switch outdoor lights to a shielded design which casts light downward, instead of upward and outward. Additionally, a yellow or red bulb is more firefly friendly. Learn more information and tips at darksky.org and firefly.org.

Article by Margie Manthey / Photo: WordPress.com

