mystery science

Grades K-5
Mini-Lesson: “Why do fireflies glow?”

VIDEO TRANSCRIPT

VIDEO 1

Hey, it's Esther! What's the coolest thing you've ever seen outside after dark? Maybe it was fireworks or a full moon. These people are getting ready to watch something you can only see when it's dark. If you can, you might want to pause the video now and turn the lights off to watch too. Check it out. Someone named Siddharth has a question about what's making these flashing lights. Let's call Siddharth now.

[Video Call]

- Hi, Siddharth!

- I have a question for you. Why do fireflies glow?

- Great question.

Did you guess that those lights were fireflies or you might call them lightning bugs? Maybe you've even seen some in person. When I'm camping, I've watched them in fields near my tent. Even though they're called fireflies and lightning bugs, this isn't light from fire or lightning. It's not from light bulbs either. This is light you can catch. Up close, you can see that this is an insect. Do you notice how these parts look different? Light can shine through them like this. The light shining through is actually made inside the firefly's body. Different chemicals in its body combine to make light. Scientists have been able to create similar chemicals. Watch what happens when

they mix two. Whoa! So each light you see here is a firefly combining chemicals in its body. How amazing is that? You may have noticed that fireflies don't stay lit up. Instead, they flash their lights on and off. But what's all this flashing about?

VIDEO 2

This is a question scientists are curious about too, and it's a hard one to answer. Fireflies don't think and act the way people do, and we can't really think like fireflies. That's why scientists start with what they can see and measure their observations to better understand what fireflies might be doing. When you watch a group of fireflies, their flashes can seem random. It's hard to keep track. But what if you focus on one firefly? You can see where it flies and when it flashes. Now it's difficult to film fireflies in the dark, so we're going to have to switch to a drawing. But what you'll see next is based on real observations of some fireflies. Okay, here's our firefly. Watch how it flashes every few seconds as it flies along. Our firefly keeps circling back to one area. And look, did you see the flash below? There's another firefly down on the grass. Our firefly keeps flashing and now the other firefly has started to flash too. They keep flashing back and forth. Then something new happens. Our firefly flies down and lands next to the one in the grass. This is something scientists have observed many times. A firefly flashes as it flies around. Another flashes back. They flash back and forth. Then the two meet up. Maybe you guessed earlier that flashing helps fireflies find each other in the dark. And you're right, that seems to be one reason why fireflies flash. Through their observations, scientists have also learned that the ones flashing as they fly are usually boys. Another word for them is males. The ones flashing back from the grass are usually females, or girl fireflies. It's like the males are flashing, “Hey, check me out.” And the female flashes back. It's like she's answering, “I see you, come over

here.” A firefly's flash is a way to send a message. Scientists call that a signal. By observing many different fireflies, scientists noticed a curious thing about these signals. Some male fireflies make a short flash every few seconds. Other males fly upwards as they flash, making swoops of light. And remember those people we saw? They're watching males that match up their flashes so they can look like ripples of light. Wow! Scientists now think that different kinds of fireflies have their own unique flash signals—and there are over 2000 different kinds of fireflies. That's a lot of signals. By flashing their unique signal, males can show, “Hey, I'm this kind of firefly.” And females of the same kind can recognize that signal. They flash back just at the right time to answer, “I'm the same kind of firefly too. Come over.” You can learn to recognize firefly signals too. There are flash charts like this that show the timing of different signals. And scientists continue to discover new flash signals as well as other ways that fireflies use their glow. They've even found that some kinds of fireflies are flash fakers. In addition to their own signals, they sometimes copy the signals of other fireflies. That's wild. So, in summary, fireflies can make their own light by combining chemicals inside their body. Even though their flashes might seem random to us, they're actually signals that help fireflies of the same kind recognize each other and meet up. That's all for this week's question. Thanks, Siddharth, for asking it.