mystery science

# Grades K-5
# Mini-Lesson: “Are butterflies the only animals that start out as caterpillars?”

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## VIDEO TRANSCRIPT

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**[Video Call]**

- Hi, Doug!
- Hi, Sumayya!
- I have a question for you. Are butterflies the only animals that start out as caterpillars?
- Ooh, that's a great question.

But rather than me answer it, I'm going to let my friend, Jeremiah, take this one. Jeremiah is a teacher who knows a lot about this subject. Let's give Jeremiah a call now.

**[Video Call]**

- Hi Doug. I hear you have a question for me.
- I do. Sumayya is wondering, "Are butterflies the only animals that start out as caterpillars?"
- I would love to answer that question.

Once, when I was living in Japan, I had an experience with butterflies that I will never forget. My students and I were on a camping trip in a place called Nada. As we hiked to our campsite, we began to notice these strange, little things hanging everywhere, from trees and bushes, and even large rocks. Even our tents were covered with them, even the inside of the tents. At first, I wanted to run back, and out of the woods as fast as I could. But when I looked at my students' faces, I realized that they were looking for me to be brave and tell them what to do. After all, I

was the teacher. So we ignored them as best we could and we went to sleep. The next morning, we noticed one of the strange things wriggling about, then suddenly it burst open and a large insect crawled out. At first, I was worried it was going to be like a scene from a scary movie. That is, until its majestic wings began to spread. Before long, it became a beautiful butterfly and it flitted away. Now, these little things hanging everywhere, they were what you might know as a cocoon. Or to be exact, since these were butterflies and not moths, scientists would call them chrysalis. By the end of our camping trip, our entire campsite was filled with butterflies. It was truly an experience that I will never forget. Just weeks before, this is what they had looked like. They were caterpillars, the baby form of a butterfly. But then the caterpillars created a chrysalis, and a few weeks later, poof, almost like magic, they emerged as a totally different-looking creature—a butterfly! I mean, it was almost like they were shape-shifting, like Maui does in the movie "Moana." Think about it for a second. Can you think of any other animal that can totally change like that? What do you think? Now would be a good time to pause the video and discuss.

Okay. You ready?

As you thought about this, you may have realized that when a lot of animals are born, they pretty much look like mini-adults. Look at this turtle. It has eyes, a nose, it even has a shell. It pretty much looks like a mini adult turtle. And check out this baby horse—it's got four legs, a mane, a tail. Except for being smaller, it looks exactly like a mini grownup horse. So are butterflies truly one of a kind? Are they the only animals that seem to shape-shift like this? Well, actually no. It may be surprising to hear that there are a lot of animals that do. Like have you ever seen one of these? This alligator-looking insect may look unfamiliar to you as a baby but I

bet you'll recognize it as an adult. Can you guess what it is? Let's watch how it changes and find out. Can you guess what it is? It's a ladybug—a type of beetle. Ladybug babies look nothing like the beetles they'll become when they're adults. When animals completely change like this, it's called metamorphosis and butterflies and ladybugs aren't the only animals that do this. In fact, a lot of insects totally look different when they're babies. Like, check this out. Goliath beetle—one of the largest insects on Earth. This is what it looks like as an adult and this is what it looks like when it's a baby. Doesn't it look like a worm? In fact, instead of being called caterpillars, many beetle babies are sometimes called mealworms. When it's time to turn into an adult, they bury themselves deep underground. After three weeks, they climb out as adult beetles. So there are lots of insects that seem to shape-shift. But what about other animals, like bigger ones? Are there any of those? There are. Have you ever seen these swimming in a pond? Though they kind of look like tiny round fish, these animals aren't fish at all. You may know what they are already. They're tadpoles. Tadpoles spend most of their time underwater. After a few weeks, the tadpoles grow back legs. And then they grow front legs and then pretty soon, their tail disappears and then pop out of the water as adult frogs. And frogs aren't the only animals that do that. Check this out. They look really similar to frogs to me. But what are they? They're salamanders. When salamanders are babies, they look really similar to frog tadpoles. Here's a trick to tell them apart though. During metamorphosis, a frog tadpole will grow its back legs first. Then its front legs. But a salamander tadpole does just the opposite. It will grow its front legs first, then its back legs. That's how you can tell it's going to grow up to be a salamander and not a frog. So in the animal world, some types of animals have babies that really just look like mini adults but plenty of animals have babies that are born looking completely different from how they'll look as adults. Baby adults that can completely change like this are so special that scientists have given them their own name—larva. We call a baby animal a larva if it has a

totally different shape or form than what it will look like when it's an adult. Caterpillars are the classic example of a larva that lots of people know. They're the larvae of butterflies. But beetles, frogs, salamanders—all start out in life as larvae and seem to shape-shift into something totally different when they're adults.

That's all for this week's question. Thanks, Sumayya for asking it.