mystery science

Grades K-5
Mini-Lesson: “How is syrup made?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! Maple syrup. I grew up with it, but a few years ago, I traveled to Europe, and I was surprised to find out that a lot of people there have never tried it before. A few of the people I met who had tried it thought it tasted disgusting. What do you think of maple syrup? Well, someone named Wren is curious about syrup and has a question for us. Let's give her a call now.

[Video Call]

- Hi, Doug!

- Hi, Wren!

- I have a question for you. How is syrup made?

- Ooh, that's a great question.

There are so many interesting reasons why you might ask a question like this. Maybe you were sitting there having breakfast, and you realized you just have no idea where syrup even comes from. I mean, milk comes from a cow. Honey comes from bees. But syrup? Or, maybe you do know something about syrup, but just not much. Like, maybe you've heard it has something to do with trees, but how do they get it out of trees? Like, are there syrup trees? Could you stick a straw in a tree and start slurping up syrup? Well, syrup does come from trees, and if we're talking about the kind of syrup that's popular in North America, we're talking about maple syrup.

Syrup that comes from a certain family of trees—the maple tree family—you might know these. Maple trees are the ones that have those little helicopter seeds that look like this and leaves that are shaped like this. So, how do we get maple syrup out of a maple tree? Well, sorry to say, you can't just stick a straw in a maple tree and just start slurping syrup out of one, although, wouldn't that be awesome if you could? But, believe it or not, the way we do get syrup out of a maple tree isn't actually that different from this. First, you create a small hole in the side of a maple tree, all the way into the bark, but not too deep, otherwise, it could harm the tree. Then, you insert a hollow tube. A liquid will slowly start to ooze out. You see that right there? You want to collect all that liquid in a bucket. Wait, so, that's it? That's how we get syrup? Well, no, not quite yet, because the stuff you collected inside that bucket, if you were to look at it and taste it, you'd see it's mostly water at this point, with just a tiny hint of sweetness, a tiny bit of sugar in it. This slightly sweet liquid you collected isn't syrup at all yet. It's what we call sap. Maybe you've heard of it. That brings us to the next important step in making syrup, taking that bucket of sap and boiling it. Now, why do you think we need to do that? Why do you think we need to boil the sap?

VIDEO 2

You might've had different ideas. For example, sometimes we boil things in order to kill germs, and boiling sap would definitely do that, but it turns out that's not the main reason we do it. You can see here—when you boil something that contains water, you cause some of that water to rise up out of the container and leave the container as water vapor, or steam. But guess what? That little bit of sugar that was in the sap, it doesn't boil away, it stays inside the container. And so, as you boil sap, what you're doing is getting rid of some of that water that was in the sap, but leaving the sugar inside. The more water you boil away from the sap, the sweeter and sweeter it tastes. As you boil sap, the color of it starts to change as well, because the heat causes some of

that sugar in the sap to turn brown, which is why maple syrup has that golden-brownish color, even though sap itself looks clear. To make syrup, you don't want to boil away all of the water from the sap. You still leave some of it behind so that it's still a liquid. But by the time you've boiled it down to being golden brown and kind of sticky, no longer runny like water, that's when you know it's ready. It's become syrup. In total, to make one gallon of maple syrup takes 40 gallons of sap. That's how much water you have to boil away. What if you kept boiling the sap so that you boiled away all of the water? Then, if you look inside your container, you'd find a solid material left behind. That's the sugar that was inside the sap, called maple sugar. Some people do boil away all the water and use maple sugar in order to make maple sugar candies. Although some of the maple syrup in the world comes from the northeastern United States, most of it comes from the eastern parts of Canada, a place so filled with maple trees that the country chose to put a maple leaf on their flag. But I want to tell you, while making this video, as I got to thinking about maple syrup, I started to get curious, too. I wondered, how did anyone ever discover maple syrup in the first place? Who figured out that inside of maple trees is a clear liquid that can be boiled and turned to something sweet? I looked up more information in an encyclopedia, and I found out that the process of making maple syrup comes from some of the Native American peoples, or First Nations peoples, whose home is in northeastern North America. For many of them, making maple syrup is a tradition that goes back hundreds of years, maybe longer. No one knows for sure how it got started or which person figured it out, but one possibility is that a long time ago, someone might've been inspired by watching this bird. Do you recognize it? It's a type of woodpecker, but unlike most woodpeckers, which eat bugs, this bird pecks on trees for a different reason. It's a type of woodpecker called a sapsucker. Watch this. Sapsuckers carefully cut away the outer layer of bark on a tree in order to do this—drink the sap, the sugary water that's found underneath. And it's not just maple trees that they drink sap

from. There's sap found in every tree. Some just have more than others. In fact, not just trees, but every plant contains some amount of water and sugar inside of it. So, it's possible to make other kinds of syrup, not just maple syrup. Maybe you've heard of some of these syrups too, like corn syrup, made from the sugar water found in corn; agave syrup, made from the agave plant; or cane syrup, made from the sugar water found in sugarcane. So, in summary, maple syrup is made by collecting the sap, or sugar water, found in maple trees, then boiling it. That's all for this week's question. Thanks, Wren, for asking it!