mystery science

Grades K-5
Mini-Lesson: “Can trees talk to each other?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! What's the oldest tree in the world? Well, some scientists think it's these, they're called bristlecone pine trees, and they're only found on a few mountain ranges in the Western United States. Some of them live to be nearly 5,000 years old. Someone named Ava has a question about trees like these. Let's give Ava a call now.

[Video Call]

- Hi, Doug!

- Hi, Ava!

- I have a question for you. Can trees talk to each other?

- Ooh, that's a great question.

If trees could talk to each other, certainly trees like these bristlecone pines would have a lot of interesting stories to tell, but trees can't talk to each other in any way that we talk. They don't have a mouth or hands or any of the body parts humans use to talk. Still, what if we broaden the word talk to mean just communicate or send any kind of message to each other? Can trees do that? Well, if you'd asked me, I would've said I really don't think so, but recently, I noticed this

group of trees. As I stared at these, I noticed something really interesting. I'm curious what you notice.

VIDEO 2

What I notice is that there's a little bit of space between each tree top, almost as if these trees can send messages or communicate to keep from getting in each other's way. Now, maybe that's just the way that they grew because that's the way that got the most amount of sunlight for each tree. But it makes me wonder, could trees actually work together like this, and if they did work together, wouldn't they have to share information to do that, maybe send messages to each other? A scientist named Suzanne Simard has thought a lot about these questions. Suzanne Simard studies trees, but not just any part of the tree. You see when she was younger, Suzanne played a lot in a forest near her home. She used to love to lie on her back and watch the tops of the trees waving around in the wind high above her. Then one day, she saw something in the forest that changed how she saw it forever. She saw a hole in the ground. That's it, just an ordinary hole. Nothing special about it. But when young Suzanne looked down into the hole what she saw blew her way. It wasn't just dirt down there. There was so much life poking through the soil under the surface, from wiggling worms to crawling bugs to tangling roots. That was the moment Suzanne Simard realized there was a whole world under the trees as well, every bit as detailed and interesting as the world above. As an adult now, her research focuses on understanding everything that's going on below the soil, at the level of the roots of the trees in the forest. As she explored the underground forest world, Suzanne Simard started paying attention to tiny living things in the soil called fungi. You might have seen some parts of fungi called mushrooms above the ground before, but there's a whole other world of fungi below the surface. These fungi form chains underground. They look like long strings. Suzanne Simard

noticed that these fungi strings don't just grow in random spots. They grow between the roots of trees, connecting the forest in a huge underground fungi web. Suzanne Simard wondered, "What can trees do with all these underground connections? Can they use them to share things or even communicate?" She set up an experiment to answer her question. She gave one tree in a forest a very specific nutrient. She waited an hour, then checked to see if that nutrient showed up in any other trees in the forest and holy cow, it did. The special nutrients Suzanne Simard gave the tree traveled down the tree's, roots, through the fungi web, into the roots of another tree. These two trees weren't touching at all, but they could still share nutrients because their roots were connected by strings of fungi. Now, this isn't exactly trees talking, but you might think of it as a kind of communication. Trees linked by underground fungi can share what they have. The same way you might swap a snack with a friend. And Suzanne Simard thinks trees might share more than just nutrients through the fungi web. She thinks trees might actually use these connections to send messages to each other. Suzanne Simard and another scientist named Yuan Yuan Song did an experiment on injured trees. When they studied a tree injured by bugs, they noticed the tree was producing an unusual chemical. That chemical traveled from the roots of the sick tree through the fungi web to a nearby healthy tree. Then the healthy tree started doing something amazing. It made a sticky substance to defend against bugs. It's a daring idea, but Suzanne Simard argues that we might think of the chemical the sick tree sent as a message, a warning signal to other trees, saying, "Hey, watch out. There are dangerous bugs around here." The nearby tree got the message and started protecting itself. So can trees talk to each other? Well, they don't communicate in words, but some scientists think forests can share nutrients and warnings with the help of a huge web of underground fungi. Still, not everyone is convinced yet. Some scientists think we don't know enough to say that trees can even communicate at all. We have lots to discover about what's really going on in forests, but one

thing is clear. There's so much more going on in a forest than what we see above ground. Maybe you'll be the next scientist to add to what we know about the complicated lives trees live right under our feet. That's all for this week's question. Thanks, Ava, for asking it!