mystery science

Grades K-5
Mini-Lesson: “Why don’t all trees lose their leaves in the fall?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! I love the fall. It's the time of year when it starts getting colder and lots and lots of people head outside to catch a glimpse of leaves. The colors of the fall leaves are absolutely beautiful in places like Seoul, Korea, and Neka, Iran, and in places like Vermont and the Northeastern parts of the United States. Maybe you live in a place where you can see some amazing fall colors in your area. Someone named Henry has a question about leaves. Let's give Henry a call now.

[Video Call]

- Hi, Doug!

- Hi, Henry!

- I have a question for you. Why don't all trees lose their leaves in the fall?

- That's a great question.

Some trees completely lose their leaves in the fall and look completely bare by winter, but others don't. Why is that? Well, I think the best way to answer this question is to go out and look more closely at which trees lose all their leaves and become bare in the winter like these, and which ones stay green like these. One pattern you're going to notice on the trees that don't look bare in winter is that they tend to look like this up close. You notice anything about the leaves?

They don't look anything like the wider leaves we see on most trees, do they? I mean, you may not even think that these are leaves at all, but they are. We call them needles because they're so thin, but technically, they are a type of leaf. They're the green part of the plant, but just narrower and thinner than most other leaves. Trees like these, the kind that don't drop their leaves in winter are called evergreen trees. Pine trees are probably the most famous of the evergreen trees, but there are other evergreen trees too, like junipers, cedars—even redwoods. Trees that do drop their leaves in the fall and go bare in winter always have leaves that are much bigger or broader in shape than a needle. They look more like this, or like this. Trees that drop their leaves in fall are not evergreen, we call them deciduous from the ancient Latin word, decidere, which means to fall down because the leaves on these trees fall off. So what's going on? Do you think the shape of the leaves could have something to do with whether they drop off in the fall or not? What do you think? Why do you think that trees that have leaves that are wide like this fall off, but the trees with skinny needle-like leaves don't?

VIDEO 2

Well, I'm not sure how you answer it, but here's an interesting clue. You see the snow falling on these branches. I know it may look pretty, but this can cause huge problems for a tree. Because the leaves on a deciduous tree are big and broad and not needles, if there's a snowstorm or an ice storm, the snow or ice can collect on them. It's almost like the leaves are mini snowcatchers. Now, a little bit of snow or ice on one leaf doesn't weigh very much, but add up all the leaves on a tree and there are thousands of them, all catching ice and snow. And all that snow can really weigh the tree down until branches start to break. That's not good. So it seems that one reason that trees with big leaves in cold places might drop their leaves in the fall is because if they kept them, all that snow or ice in the winter could add up and break their branches off. And if you

were a tree, wouldn't you rather drop your leaves off before the winter, even if it means not having leaves for a while, instead of losing all your branches? Okay. Now let's compare that to evergreen trees. Look how thin those needles are. Snow and ice aren't going to be able to pile up on them like it does with bigger, broader leaves in other trees. And check out how these needles are pointing downward, almost like a slide. A lot of evergreen trees have needles that point down like that so that the snow can slide right off. So having thin needles keeps branches from getting weighed down and breaking off, which is great for the tree. Since the leaves are safe, there's no reason to drop the needles and the evergreen tree can stay green all year. Now, there is more to why some trees drop their leaves than just protect their branches during the winter. For example, scientists have discovered that freezing temperatures alone, even without a snow or ice storm can damage the green stuff inside of the leaves, which is important for the tree. This is why most trees with leaves will actually pull the green stuff from their leaves back into their trunk in the fall to save it. If you're curious about that, check out our mini-lesson about why leaves change color in the fall. So in summary, evergreen trees have thin needle-like leaves that keep snow and ice from piling up and damaging branches. Since these leaves don't need to drop off in the fall, evergreen trees can stay green all year. That's all for this week's question. Thanks, Henry, for asking it!