mystery science

Grades K-5
Mini-Lesson: “Does trash last forever?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Danni! In my life, I've been lucky to travel to a lot of incredible places. I've been to big cities, tiny islands, climbing on huge glaciers, and scuba diving deep in the ocean. But whether I'm close to home or thousands of miles away, well, there's one thing I can usually find in any place that I go. Yeah. Trash. Humans create trillions of pounds of trash each year, so it makes sense that wherever you find people, you'll probably also find some garbage. Someone named Clementine has a question about this. Let's call Clementine now.

[Video Call]

- Hi, Danni.
- Hey, Clementine.
- I have question for you. Does trash last forever?
- That's a great question.

All that trash in the world, will it ever go away? If you've used a compost bin before or you've seen our video on composting, you might already know that under the right conditions, food scraps can decompose, breaking down into smaller parts. Those smaller parts can be used to help new plants grow. Can other waste do that? Could we turn all our trash into a garden of growing plants? Sounds nice. The problem is, trash is not all the same. Imagine you carry your cafeteria tray over to the waste bins after lunch. You might have food scraps like a half a slice of

pizza or a banana peel. You might have paper products like a napkin with some pizza sauce on it. You might have plastic like a plastic fork or yogurt cup. All these things are made of different materials. Now imagine instead of sorting your waste into bins, you leave your tray outside. After a week, you come back to check on it. What do you think you'll see? Which materials will look different and which will look the same? What about in a month, or a year?

VIDEO 2

Most materials change and break down over time, but some break down faster than others. After a week outside, your banana peel might turn brown and get stinky. Your half-eaten slice of pizza might grow some mold. A month later, that paper napkin might start to fall apart, especially if it gets wet in the rain or snow. But what about that plastic fork? How long would you have to wait for that to change? It depends on how the plastic fork was made because different kinds of plastic are made of slightly different things. But in general, many plastics can sit in sun, cold, and rain for a long time without changing very much. And the tiny living things that help break down food scraps and compost usually can't break down most kinds of plastic either. Still, nothing is forever. Right? You've probably seen plastic items get worn over time. Maybe you've seen a plastic slide at the playground that looks lighter in color in some places from sitting in the sun day after day. Maybe you've had a plastic toy wear down over the years. If plastic is exposed to enough wind, water, wear, and tear, and heat, eventually, it will break down into smaller and smaller pieces. Now you know that when a banana peel decomposes, it breaks down into smaller parts. In the right conditions, those smaller parts transform into something growing plants can use to grow. So old composted food scraps help make something new: new plants. A few kinds of plastic are specially designed to do this too, decompose like food scraps do. But most plastics don't work that way. With a lot of energy and effort, we can sometimes use

machines to recycle one plastic item into another plastic item. But even then, when those plastics break down, the smaller pieces they break into are just tiny pieces of plastic. Same material, just smaller. What was once a plastic fork can eventually break down into so many tiny pieces, you almost can't see them anymore. But that's not always a good thing. When plastic gets this tiny, wind and flowing water can easily move these tiny pieces long distances. Tiny pieces of plastic have been found in many spots we wouldn't expect, like at the bottom of the ocean and at the top of Mount Everest. They've even been found in some drinking water. Scientists are still trying to understand how these tiny plastics affect the plants and animals living in these places. What we've seen so far isn't great. Living things that eat, drink, or grow around too much of these tiny plastics can get sick. One thing we know for sure is that when tiny pieces of plastic end up in unwanted places, it's hard to get them out again. Ever picked up a plastic bag off the ground? Easy. Right? Now, instead, imagine picking a handful of plastic glitter off the ground. Not so easy, right? You see the problem. So, in summary, trash is made up of different kinds of materials. Most materials change and break down over time. Some materials can break down quickly, like composted food scraps, while others, like plastics, usually break down slowly or maybe even never. Composted food scraps can break down into parts that help plants grow, but some materials, like many kinds of plastics just break down into smaller pieces, which can harm plants and animals around them. But you can help. If you reduce the amount of plastic you use and toss away, you can reduce the amount of plastic that's around in the world for years to come. You can also make sure that you dispose of any waste you have in proper bins, so it's less likely to end up in the way of humans or critters. That's all for this week's question. Thanks for asking, Clementine.