mystery science

Grades K-5
Mini-Lesson: “How are waves made in the ocean?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Danni! Check this out. Every year surfers travel to this beach on the island of Oahu in Hawaii to surf some of the biggest waves in the world. This beach is called Waimea Bay and it's famous for having giant waves, which is why so many surf contests are held here every winter. Someone named Wyatt has a question about waves. Let's give Wyatt a call.

[Video Call]

- Hi, Danni!

- Hi, Wyatt!

- I have a question for you. How are waves made in the ocean?

- Ooh, that's a great question.

When I was little growing up in Florida, I loved going to the beach. I've always felt a sense of wonder watching the waves rolling onto the shoreline. Maybe you've been to the ocean before, or maybe you've seen it in movies or videos. Watching the waves crash against the shore, you might've noticed how they look like they're traveling toward you from far away and how they don't ever seem to stop. What do you think makes waves? Where are they coming from?

VIDEO 2

I don't know exactly how you answered, but I'll bet you had a bunch of different ideas about what makes waves, like maybe waves are made by boats speeding across the water, or maybe some kind of animal with a powerful tail, like a dolphin or a whale, makes it as it swims. You might have even thought of something like an underwater earthquake, which can cause a giant wave called a tsunami. And it's true. All of these things can make waves. But what about those days when there are no boats, no whales, and no underwater earthquakes? There are still waves happening on those days, too. So what could be causing them? One clue is to look at a much smaller body of water than an ocean, something like a pond or a lake. On a calm day, without any wind blowing, the surface of this lake looks calm and smooth, almost like glass, but on a windy day, watch what happens. The surface looks choppy, and the water is sloshing all around. And look. There are some little waves. As the wind blows, it breaks up the smooth surface of the lake, creating ripples, kind of like when you jump into a swimming pool or throw a rock on the surface of smooth water. Even splashing in the bathtub makes ripples like these. And when the wind blows, the ripples grow until they become big waves. So could wind be what's causing most of the waves we see on the ocean? Definitely. If you visit the ocean on a windy day, the waves are probably bigger. On a calm day, the waves are probably smaller. This is because stronger winds make bigger waves, something kiteboarders know all about. But here's something weird. If you go to the ocean on a calm, windless day and you stand on the beach, you will still see waves, and sometimes, they might be really big waves. So what's up with that? Well, scientists who study oceans... they're called oceanographers... were curious about this as well, so they set up wave observation stations on different islands to track waves, and what they learned was mindblowing. They saw that those waves could travel from one side

of the world to the other. So when you see waves at a beach on a windless day, those waves could be caused by winds from far away, even thousands of miles away. Do you remember the waves you saw at the beginning of this video in Waimea Bay, Hawaii? Those waves have been traced all the way back to Alaska, created by powerful winter storm winds there. How cool is that? But the discovery that most ocean waves are started by wind is just the beginning. There's so much more we haven't answered here, like why do waves start to curl at the top as they get closer to shore, then crash on the beach, instead of flooding the beach? The ocean is such a special place and so filled with mysteries. I hope we can explore those questions and more in a future episode. That's all for this week's question. Thanks, Wyatt, for asking it!