mystery science

Grades K-5
Mini-Lesson: “Why are tornadoes so hard to predict?”

VIDEO TRANSCRIPT

Hi, it's Doug! Making a mini-tornado, like I'm doing here, is so fun! But tornadoes in real life are no fun at all. I grew up in a place where tornadoes would happen every year. Luckily no one ever got hurt. But when a tornado was spotted, the town would sound the sirens and everyone knew to take shelter.

Someone named Hai Ming has a question about tornadoes. Let's give him a call now.

[Video Call]
- Hi, Doug!
- Hey, Hai Ming!
- I have a question for you. Why is it so hard to predict a tornado?
- That's a great question.

Tornadoes are a type of extreme weather made of powerful swirling winds. Some tornadoes are strong enough to tear buildings apart, like this one. Watch this. It tears the roof off that house. Do you see that? The most powerful tornadoes can leave behind entire towns that have been destroyed. That's what you're seeing here.

Because of how dangerous tornadoes can be, weather forecasters try to warn people if a tornado is going to happen. That way everyone nearby can get somewhere safe. The more time

people have before a tornado hits, the less likely they are to get hurt. So forecasters try to predict tornadoes as far ahead of time as they can.

But for most of history, the only warning you got about a tornado was if you looked outside and you saw one. Today tornado warnings have gotten a lot better. And that's thanks to tools like radar, which help forecasters see patterns in the weather. But tornado warnings still aren't great. Most times people only get warned about 13 minutes ahead of time. That's not much time at all.

What do you think makes it so hard to predict tornadoes ahead of time?

Now would be a good time to pause the video and discuss.

Okay. You ready?

It might help us figure this out if we compare tornadoes with another form of extreme weather, hurricanes. Unlike tornadoes, hurricanes are pretty easy to predict. Usually, hurricane warnings give people at least two days before a hurricane hits. That's enough time to pack up your things and get somewhere safe.

But hurricanes form very differently than tornadoes do. You see, hurricanes start out over the ocean. Then they travel for days or even weeks before they hit the land. Scientists can easily see the clouds of a hurricane forming so they can figure out where a hurricane is likely to hit and how strong it will be.

Tornadoes aren't like that. They form over land and quickly swoop down out of the sky to touch the ground. Tornadoes can form and start causing destruction within minutes. Scientists don't have days or weeks to predict them like they do with hurricanes.

Instead, scientists look at weather maps showing big thunderstorms like this. This is a storm moving across the US state of Oklahoma. Scientists put together weather images like a video to try and spot where tornadoes are forming. Did you catch the tornado here? Let's watch again. The tornado starts right there. On the edge of the storm. It was really quick. Tornadoes are there and then they're gone. So it's hard to predict exactly where and when a tornado will hit.

But scientists have figured out that, at the very least, they can pay attention to what weather conditions are likely to lead to tornadoes. That way people can be on the lookout. The first thing scientists look for is a thunderstorm. But not every thunderstorm creates a tornado. Scientists check for strong winds from different directions coming together in just the right way to create a vortex—kind of like when you unplug the drain in a bathtub. The water starts to swirl and makes a vortex going down the drain. In a tornado, there's a vortex of air. But it's going upward into the storm clouds above.

Today scientists are working on better ways to predict tornadoes using computers. They hope that eventually, they'll be able to predict tornadoes up to an hour in advance. So people have more time to prepare. But tornadoes will never have as much warning time as things like hurricanes.

Luckily, people in tornado zones often have basements and tornado shelters that can protect them even if a tornado comes quickly.

So in summary scientists know that tornadoes come from big thunderstorms with strong spinning winds. But predicting exactly when and where tornadoes will hit is still really difficult.

That's all for this week's question. Thanks, Hai Ming, for asking it!