mystery science

Grades K-5
Mini-Lesson: “Why do places have different times?”

VIDEO TRANSCRIPT

Hi, it's Doug! I'm surrounded by clocks. I've actually been collecting clocks recently. I like clocks. Let me show you my favorite one. This one's so cool! I love the way the numbers light up like that. This one's called a Nixie tube clock.

Someone named Alessandra has a question about time. Let's give her a call.

[Video Call]
- Hi, Doug!
- Hi, Alessandra!
- I have a question for you. Why do places have different times?
- That's a great question.

It's true! Different places on Earth have different times. Let me tell you a little story.

A while ago I went to call my friend Anand who was living in the Country of India. Now, for me, I had just finished eating my lunch in California, where I live. It was afternoon, but when I called Anand, I actually woke him up. It turns out it was the middle of the night in India where he lived. Sorry about that, Anand! So think about that—that's a huge difference in time between two places on Earth. I went to call someone in the middle of the day, in my time, and it turned out to be the middle of the night, his time.

You might have even had your own experience like this, maybe just not as big. For example, I mentioned that I live in California. Well, my grandparents live over here in Illinois. Whenever I call my grandma and grandpa, like around dinner time for me, it's evening for them too—but it's not the same time. For them, it's later in the evening. They've already eaten dinner and it's almost their bedtime.

Why is this? Why do different places have different times? What do you think? Now would be a good time to pause the video and discuss.

Okay. You ready?

To figure this out, one thing I would suggest we do is look at a *globe*. A globe is a model of the Earth. A tool that helps us imagine the whole Earth.

Now, we know the difference between California and India is a really big difference in time. It's literally the difference between night and day. So what's going on here? If you look at a globe you can find—here's India right here. But California is all the way over here. So we can see, California and India are on opposite sides of the globe. Hmm, interesting.

Now, if we imagine this globe being the actual Earth in space—you've got the Sun over here—and it's shining sunlight onto this half of the Earth. So when sunlight is shining on this side of the globe that means it's daytime over here. And think about that—that means on the other side of the globe—over here where the sunlight can't reach, it's nighttime. So you see, that's why. If it's the middle of the day, my time, and I call India on the other side of the globe, it'll be the middle of the night for people in India. So the time difference is because the world is a big round ball and India and California are on opposite sides of that ball.

Now, what about smaller differences in time? Like, the fact that when it's dinner time for me in California, it's bedtime for my grandparents in Illinois.

Well, if you were to call people all around the Earth and find out all the time differences, you would discover a pattern. You see, there are 24 hours in a day and to put it simply, we've basically divided the Earth up into 24 sections, or zones. We call these *time zones*.

Now, each time zone is one hour apart. So, say that in this time zone—right here—it's 3:00 in the afternoon. That means in this time zone—next to that—it's 4:00. And in the time zone next to that—it's 5:00. So, with these sections—or time zones—in mind, now you can figure out why there was even a time difference between me and my grandparents?

If we look at the globe with the time zones drawn on it, notice that even though my grandparents don't live on the other side of the Earth from me, they don't live in the same time zone that I live in. They're two time zones ahead of me, so that means they're two hours later than my time. That's why when it's dinner time for me it's bedtime for them.

People have actually given each time zone its own name. You might have heard of these. I live in a time zone of North America called Pacific time, and my grandparents—their time zone is called Central time.

Do you know what time zone you live in? If you live in the United States you can pause the video to look at this map and find out.

So in summary, different places on Earth have different times because the Earth is round. While some people are facing towards the Sun, so it's daytime, other people are facing away from the

Sun, so it's nighttime. Since there are 24 hours in a day, we've divided the Earth up into 24 sections, or time zones, each one hour apart.

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