mystery science

Grades K-5
Mini-Lesson: “How often do eclipses happen?”

VIDEO TRANSCRIPT

Hi, it's Doug! In 2017, I traveled to the state of Oregon to watch the total eclipse of the Sun. I had to wear these special glasses when I did. A total eclipse of the Sun hadn't crossed the United States like that in nearly 100 years. But, a very different kind of eclipse is happening soon—an eclipse of the Moon.

Someone named Talyah has a question about eclipses. Let's give her a call now.

[Video Call]
- Hi, Doug!
- Hi, Talyah!
- I have a question for you. How often do eclipses happen?
- That's a great question.

The Moon is one of my favorite things to look at. It has so many interesting things that you can notice. Like, in a previous episode, we talked about the dark spots on the Moon. What some people call the Man in the Moon. What's something interesting you've noticed about the Moon?

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

Okay. You ready?

Well, there are lots of things you might have noticed about the Moon before. Like, maybe you've noticed how the Moon seems to look bigger whenever it's low in the sky. Or you've probably also noticed how the Moon appears to change shape. We call these the phases of the Moon. Like, some nights it looks like this. But sometimes it looks like this. And of course, there's the full moon—that's when you can see the whole thing.

Now, here's something that's very strange. People have noticed that sometimes on special occasions when it's a full moon out, the Moon starts to do this—it looks like it starts to disappear.

Now, you might think, "Oh, maybe that's how it changes phases." Like, maybe that's how it goes from being a full moon to a crescent moon. But that takes days to happen.

What you're seeing when you see this, is something that happens in just a few hours. What is going on here? Is the Moon disappearing?

It turns out what we're seeing when this happens is an eclipse of the Moon, a lunar eclipse. A lunar eclipse is different from a solar eclipse, or an eclipse of the Sun. That's when the Moon appears to go in front of the Sun. So a solar eclipse always happens during the daytime.

And a solar eclipse is pretty rare. The Great American Solar Eclipse of 2017 was the first time in nearly 100 years that a total eclipse of the Sun was visible across the United States.

But in a lunar eclipse, the Moon is the main character. A lunar eclipse is something that can only happen at nighttime. You're not looking at the Sun, you don't need special glasses to watch it, and lunar eclipses happen a little more often than solar eclipses do.

You can usually see one about every two years or so.

For a long time, people had no idea why the Moon would seem to disappear during a lunar eclipse. In fact, if you didn't know that the Moon was going to come back you might really worry that it was actually disappearing and leaving us forever.

But eventually, we were able to figure out that as the Sun shines on the Earth, the Earth casts a shadow outwards into space.

It's really just like how we cast shadows here on the ground. A lunar eclipse happens when the Moon passes through the shadow of the Earth. That's why the Moon seems to disappear.

In fact, you can notice that the shape of the shadow is curved, just like the Earth. Think about it, the Earth is round. Once the Moon moves out of our shadow the full moon reappears again.

But, I've saved the best part of a lunar eclipse for last.

I haven't mentioned the strangest thing of all about a lunar eclipse. Not only does the full moon seem to start disappearing as it goes into the Earth's shadow, but watch what happens as the Moon gets into the very center part of the Earth's shadow. There, do you see that? Now, you'd think that in the center of the Earth's shadow, the Moon would look totally black, but it doesn't—it turns reddish-orange!

Isn't that weird? Some people say it's the color of blood. For this reason, people sometimes call a lunar eclipse a blood moon.

From having watched a lot of lunar eclipses since I was a kid, I've learned that no two lunar eclipses are exactly alike. Sometimes it looks orangy-red, like this, but sometimes it looks really deep red, like this. And other times more brownish-orange.

For me, that's part of the thrill of watching a lunar eclipse. You never know exactly what color it's going to be until you watch it happen.

So in summary, a lunar eclipse happens when the Moon moves through the shadow of the Earth. It makes a full moon seem to disappear and then reappear again. Surprisingly, once the Moon gets to the center part of the Earth's shadow, it turns a reddish-orange color. What some people call the blood moon. Lunar eclipses happen about every two years or so. So you've got a lot more chances to see them than you do a solar eclipse.

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