Grades K-5
Mini-Lesson + Activity: “Why are people making such a big deal about the solar eclipse?”

VIDEO TRANSCRIPT

MINI-LESSON VIDEO 1

Hi, it's Doug! I know what you're thinking: What is this guy wearing? What are those, some kind of sunglasses? But, by the end of this video you're going to want a pair. These are not sunglasses—these are special glasses. It's one of the only ways that makes it safe to look at the Sun. They're called *eclipse glasses*. Now, if you haven't heard, there's going to be a total eclipse of the Sun on Monday, August 21st. So, why am I wearing these glasses now? Well, I heard that someone named Noa has a question for us about the eclipse. Let's give her a call.

[Video Call]

- Hi, Doug!

- Hi, Noa!

- I was wondering, I heard about the solar eclipse that's going to happen. Why are people making such a big deal about it?

- That's a great question. It is a big deal!

On Monday, August 21st, 2017, at first it'll seem just like any day. You know, the Sun will come up, it'll be light out that day—but then in some parts of the U.S., it will start to become dark. The air will get cool. Birds will start singing their evening songs, and crickets will start chirping. It will

get so dark, you'll be able to see stars in the middle of the day. It's like there's going to be a few minutes of nighttime during daytime. It's going to be strange. Now think about it. When have you ever seen this happen? That's why people are getting so excited. This is going to be rare, so rare. The last time it happened across the U.S. like this was nearly 100 years ago. Now, personally, I've been so excited about this day since I was in grade school when I got my first astronomy book and it had a list of all the eclipses that will happen in the United States. See, I remember all the way back in the 1980s seeing this date written in the book: August 21st, 2017. To me then, that was the distant future, but that day is now coming. Now, wait a second. Why does this happen? Why will it get so dark in the middle of the day? Before I say anything else, first I want you to stop and think about it. What do you think? Now would be a good time to pause the video so that you can think and discuss this with someone near you.

MINI-LESSON VIDEO 2

Why will it get so dark in the middle of the day? Well, you might know that the Moon travels around the Earth. And maybe you thought, or have heard, that if the Moon were to go in front of the Sun, like I'm doing with this paper moon and lamp, that would block out the Sun's light. And if it covers the Sun completely, it might make it seem like nighttime in the middle of the day. Well, that's what happens during a solar eclipse. That's the Moon right there covering the Sun. In fact, when the Moon goes in front of the Sun like this, it's casting a shadow on the Earth. So in other words, if you were an astronaut looking down on the Earth from space while a solar eclipse is happening, you'd see this big round shadow on the ground. This is a real photo taken by an astronaut during an eclipse. Now, for this eclipse in August 2017, you'll only see the Moon completely cover the Sun if you live along this pathway in the United States. If there's any way you can get to this path, try to do it. Not only will it look like nighttime in the middle of the day,

but when the Moon covers the Sun completely, you might even get to see flames of hot gas shooting off the Sun's surface. Now, if you can't get to this path in time, there's still some good news. For most of the United States and parts of Canada and Mexico, even if you're not in the path, you'll still get to see this: that's the Moon going partly in front of the Sun. Now, it won't get as dark as nighttime, but it will look like the Moon is taking a bite out of the Sun, which is also rare, so definitely check it out. I hope you'll try to watch the eclipse. Special eclipse glasses are one of the few ways that make it safe to look directly at the Sun. So whether you're in the path of the total eclipse, or you're just going to see the Moon partly block the Sun, you should try to get a pair of these glasses either way. If for some reason you can't get these glasses, or if you're not able to see the eclipse, I'll show you some instructions in the next video. That's all for this week's question. Thanks, Noa, for asking it. I hope you all have an amazing time with the eclipse. It's not every day you get to see the Moon go in front of the Sun. Have fun, and stay curious!

ACTIVITY INTRODUCTION VIDEO

If you don't have solar eclipse glasses, that's okay. In just a minute, I'm going to show you how you can use two pieces of paper to watch the solar eclipse. Now, this won't let you look directly at the Sun. That's dangerous and can damage your eyesight unless you have those special eclipse glasses. What I'm going to show you is a different way to see the Sun without actually having to look up at it. Instead, you and a friend are going to look down at a piece of paper to see what's happening. I know this sounds weird, but it really works. When the eclipse is happening, and the Moon is starting to block the Sun, you'll get to see the same thing on your paper. What I'm going to show you is a way to project an image of the Sun onto a piece of paper so that it's safe to look at it. This is called a pinhole projector, and it will let you see what's

happening in the sky without having to look directly at the Sun. All right, let's make one. It's easy. I'll show you how to do it, step by step.

ACTIVITY STEP 1

Find a partner. Decide who will be the Sun Master and who will be the Tilt Master. When you're done with this step, click the arrow on the right.

ACTIVITY STEP 2

Get your supplies. Each group needs one Tilt Sheet, one Hole Sheet, and a pair of scissors.

ACTIVITY STEP 3

Tilt Master: you're in charge of the Tilt Sheet. It's ready to use. Sun Master: you need to fold the whole sheet in half on the dotted line. Just line up the edges of your paper and press down with your finger to make a crease. Then, cut out the black triangle. Now, when you unfold it, you should have a small square hole in the middle. Now your sheet is ready to use too.

ACTIVITY STEP 4

Watch this step so you know what to do when you go outside. Don't do anything yet, just watch. Okay, Tilt Master: first, you'll find where the Sun is in the sky. Just look for your shadow. The Sun is in the opposite direction. You'll sit down and you'll tilt your sheet toward the Sun. You'll stay there just like that while you watch the eclipse. Now, Sun Master: you'll hold your sheet above the tilt sheet. Lift it up closer to the Sun, like this. Now, doing this will make a picture of the real Sun appear on the tilt sheet. Now that you both know what to do, let me show you a closer view. When the paper is held close, you'll see a square or a diamond shape on the Tilt

Sheet. But as you pull the whole sheet away, notice it becomes a circle. It becomes a real picture of the Sun. While the eclipse is happening, you'll see the Sun really change shape as the Moon passes over it. Okay, now that you know your job, go to the next slide and we'll practice indoors.

ACTIVITY STEP 5

Let's practice! Pretend the Sun is directly above you on the ceiling. Tilt Master: sit on the floor. Tilt your Tilt Sheet up towards the Sun. Okay, Sun Master: put your Hole Sheet above the Tilt Sheet, and lift it up closer to the Sun. All right, good job; you're done practicing. You can take a seat.

ACTIVITY STEP 6

If you can't remember what to do when you go outside, look at the instructions printed on your paper. Whether you're going to see a partial eclipse or a total eclipse, I hope you have an amazing time. It's not every day you get to see the Moon pass in front of the Sun. Have fun and stay curious!