mystery science

Grades K-5
Mini-Lesson: “What causes the Northern Lights?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! This is my sister, Heather, and her family. They live up in Northern Canada, and a couple of years ago, I got to go visit them. One of the coolest things we did on my trip was to go in their backyard and see this—this amazing greenish glow covering the sky.

Maybe you've heard of this before. It's called the *Aurora*—or the *Northern Lights*.

Someone named Robin has a question about this. Let's give him a call now.

[Video Call]
- Hi, Doug!
- Hey, Robin!
- I have a question for you. What causes the Northern Lights?
- That is a great question.

When most people see the Northern Lights, it's usually in a photograph like these. It's just a still image. So I was really surprised when I got to see them in real life because what I didn't know is that the Aurora actually moves in real life, this is a real-time video—it's not sped up. Even if you

do look at them in a sped-up video, it's just as amazing. You can really get a sense of how they move. They look like curtains of light dancing across the sky.

What are these incredible lights? And why did I have to go all the way up to Northern Canada to see them?

Well, for starters, it's not just in the northern parts of the world that we see them. You can see them in the far southern parts of the world, too. The Northern Lights are something that can only be seen in places near the poles of the Earth—both the North Pole area and the South Pole area—which means not only can you see them from Canada, Alaska, Iceland, and so on, but sometimes you can see them in parts of southern Australia, New Zealand, and Antarctica.

Because you can see them in both the North and the South Pole areas, scientists prefer to call them Auroras—a name that doesn't automatically have the word “Northern” or “Southern” attached to it. And Auroras don't just come in green light, either. Green is definitely the most common, but sometimes, they can appear red—even pink.

But what makes these lights happen? What do you think?

VIDEO 2

For most of history, the Auroras were one of the greatest mysteries. No one knew for sure why they happened. Some of the Dene people—people like my brother-in-law's family in Northern Canada—a long time ago had noticed a similarity between the glow of an Aurora and the glow from little electrical sparks you can see from static, like when you get a little shock.

Today, we know that the Dene people were onto something when they noticed that. As unbelievable as this might sound, scientists have discovered that the Sun actually gives off a little bit of electricity—especially when there's a lot of eruptions of hot gasses from its surface. These gasses released by the Sun contain electricity.

When some of this material escapes from the Sun and makes its way all the way to the Earth, it hits the top layers of the Earth's air, zapping it. That causes those layers of air to glow. When this happens, down here on the surface of the Earth, we see this—the Auroras. So the Auroras happen when small amounts of electricity from the Sun zap the air.

But why does this only happen around the Poles? That's a harder question to answer. It has to do with the incredible discovery that the Earth is a giant magnet—a magnet that's strongest near the North and South Poles. The area around the North and South Poles attract the electrical material from the Sun. So that's why the air around those places gets zapped more often than other places on Earth. That's why there are Auroras there.

There’s lots more you can learn about all of this. Definitely ask more questions about anything you're curious about. For now, let me just leave you with this thought: if Auroras are caused by zapping air with electricity, does that mean we could actually create our own Auroras?

We can! In fact, we do. By placing a little bit of air in a glass tube, then running electricity through it, we can make that air glow—just like an Aurora. Scientists have discovered that it doesn't even have to be air. We can use other kinds of gasses, too. And these create different colors.

Check this out. A gas called argon glows a light purple color when it's electrified. A gas called neon glows reddish-orange. Today, we tend to call all of these lights *neon lights*, no matter what color they are, since neon was the first gas to be used when people started making these.

So next time you see a neon sign, think of Auroras. They glow for the same reason.

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