mystery science

Lesson: “What if there were no windows?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

Hi, it's Doug! I want you to use your imagination today. Imagine that you woke up one morning, and your room seemed unusually dark for morning time. So you go downstairs to the living room. And wow, it looks dark here too! In fact, the whole house looks pretty dark. And that's when you realize, wait, where are the windows that used to be here? What is going on? The windows in your house are all gone. It's all just walls. So you ask your parents, "What happened to the windows?" And your parents say, "What are windows?" "Are you serious," you ask them, "You know, windows. The things made of glass that let us see outside." "What's glass," your parents ask you. "You guys don't know what glass is? Come on! You know what I'm talking about. It's that stuff that our car’s windshield is made of, it's see-through." So you take your parents out to the driveway to show them, but to your surprise, even the car's windshield isn't there. It's just metal. What is going on? It's like you're living in a world where there's no glass? There's no material that’s see-through—no windshields, no windows, nothing! Now luckily, all of this has just been using our imagination. But what would this world be like? I mean, if there were no see-through materials—no glass, nothing see-through at all. How would your life be different?

EXPLORATION VIDEO 2

Without see-through material like glass, it'd be terrible. Having something be see-through is really important. It's so important that we even give see-through its own fancy word—transparent, which means, let's light through. Like if we didn't have glass, we wouldn't be able to have windows that let light through to our homes, or schools, or buildings during the daytime. It'd be all dark and gloomy inside. Kind of sad. Or imagine if we couldn't let light into our cars. If we didn't have windshields To see where they're going, the driver would have to stick their head out of the car. That would make it so hard to drive. But you know what, we actually haven't always had things that are see-through. See-through materials, like glass, had to be invented. Before they were invented, most people's homes didn't have windows. Think of how dark it would have been inside this house. These homes were completely made of materials that weren't see-through. Materials like wood or stone. These are not see-through. The fancy word for this is opaque, but I'll keep saying not see-through for now. I'll bet you can think of other examples of things that are not see-through or opaque. Like a metal pan. Or what the walls are made of in your house. So a long time ago when wood, and stone, and metal were the only materials that people had, houses couldn't have windows. Because none of those materials are see-through. But the very first windows weren't actually made of glass. Before glass was invented, people had discovered something special. Take a look at this. People discovered rocks that were made of this stuff. If you're curious, it's called mica. You can see that mica peels off in layers or sheets using a tool. Now there's something to notice about this. Watch what happens if I take a piece of mica and I put my hand behind it. Look. Notice how you can kind of see my fingers? It's a bit blurry and hard to see. But mica is kind of see-through. Scientists call this translucent. So if people could find mica, instead of having dark houses, people could make

the very first kind of windows. Do you see how it lets light into the room? But it's still kind of blurry. You can't see clearly outside since mica's only kind of see-through. So what about the windows we have today? Who discovered glass? Glass was invented a long time ago. So long ago that we don't even know the person's name. All we know is that someone had the idea to put sand into a really hot oven. Yes, sand. Like at the beach. Here's someone today who does this. What happens when you put sand in a really hot oven? Well, once the sand gets hot enough, it melts. And you can see, look here. It looks a lot like lava, doesn't it? Now that it's melted, then you can pour the melted sand, like this. And then once it cools off, it does become hard and see-through. It becomes glass. This is a window being made. See right there? But you could have made it into any shape, even into glass bottles like this. So once people discovered that they could melt sand to make glass, we could have the first totally see-through windows. Take a look around you now. All the glass you see was once sand that had to be melted. Thank goodness for whoever discovered this strange fact about sand, because this is how we have windows, but also windshields, eyeglasses, and anything made of glass. So we've seen that in terms of how see-through something is, there is not see-through, your materials like wood, there's kind of see-through, like the first types of windows, and there's completely see-through, like today's glass windows. But is glass the only thing that's completely see-through? Well, go find out for yourself. In a minute, you'll get a pile of materials and three pieces of paper to sort the materials onto. You're going to look through each material. If you can see clearly through a material, it's see-through, or transparent. So you'll put it there. If you can't see anything through a material, then it's not see-through, so you'll put it there. And if you can see through the material just a little bit, maybe you see some blurry shapes or a little light coming through, then that material is just kind of see-through, so you'll put it there. If you're in a class, you'll sort the materials you get with a few friends in a group.

ACTIVITY INTRODUCTION VIDEO

In today's activity, you're going to make artwork to hang up in a window, like this. Now, most people today have see-through glass windows. So no one would ever use just a kind of see-through window like this anymore, right? Well, actually, some people do. Some people have colorful windows that look like this. They let light shine through, but you can't see outside of them. They're only kind of see-through. This type of window is called a stained glass window, and they're made by artists. Today, you're going to be an artist who makes something similar to hang in your window. Now to make your stained glass window, you'll use tissue paper, like this, which is kind of see-through. When you're done, you'll stick the sticky paper to a window and see what it looks like when the sun shines through. Are you ready? I'll walk you through the activity, step by step.

ACTIVITY STEP 1

Get your supplies. You'll need small pieces of tissue paper and a flower shape paged. You'll get the sticky paper later. When you're done with this step, click the arrow on the right.

ACTIVITY STEP 2

Have someone lay a piece of sticky paper on top of your shape sheet with the sticky side facing up. Make sure the sticky side is up and not down. That's important.

ACTIVITY STEP 3

Put tissue paper pieces on the sticky paper. They'll stick when you push them down. But you can also pull them up if you want to move them. You can make your flower using any colors you want. You don't need to make it look like ours. When your artwork is done, go to the next step.

ACTIVITY STEP 4

When your artwork is done, press all the tissue paper down firmly like this.

ACTIVITY STEP 5

Have someone pick up the paper and press the sticky side to a clean window, like this. Look at how the light shines through.

ACTIVITY STEP 6

Tissue paper is kind of see-through. But look at the places where one piece of tissue paper is on top of another piece. What happens there?