mystery science

Grades K-5
Mini-Lesson: “How does the heart pump blood?”

VIDEO TRANSCRIPT

Hi, it's Doug! So, every Valentine's Day, you see a bunch of hearts that look like this. But it's funny, I have here a wooden model of a human heart—so this is the actual shape of the heart inside of our bodies. You see that? They don't look anything alike.

Someone named Kayla has a question about hearts. Let's give her a call now.

[Video Call]
- Hi, Doug!
- Hi, Kayla!
- I have a question for you. How does your heart pump blood?
- That's a great question.

This is a picture of what a real human heart looks like. You probably know that the job of the heart is to pump blood through your body. It's one of the most important organs in your body. You couldn't live without it. It's so important that when you go for a checkup, what's the first thing the doctor does? They listen for the sound of your heartbeat to make sure that you're healthy. Listen to that. Did you ever think about why we call it a heartbeat? It's kind of like the rhythm in a song. It just keeps repeating, making the same sound over and over again. Thump, thump, thump, thump. Why does it make a sound like that? Sure, you know it's pumping blood, but what exactly is going on that causes it to make that thump-thump sound?

Okay. You ready?

Well, people have always known that the heart makes a sound, but it wasn't obvious what exactly the heart is doing when it makes that sound. That's because, while it's easy to hear the heart, it's not easy to see it. I mean, it's not like anyone has clear skin. But what if I told you that there's an animal that does? Check this out: this is called a glass frog. Now, its skin isn't made of glass, that's just its name. But the skin really is see-through, especially on the underside. Here's the underside. And look right there, you see that? That's the frog's heart beating. So this is what a heart looks like each time it beats. Thanks to modern technology, we now have imaging that lets us see our own hearts as they beat. This is an animation showing what your heart looks like inside your body. Do you notice now what the heartbeat is? With each beat, you can see the heart is giving a big squeeze, almost like if you squeeze your fist. When scientists first discovered this, it reminded them of other parts of the body that are good at squeezing, like your hands and your arms. The parts of the body that are good at squeezing are muscles. By looking at the actual heart, scientists figured out that, in fact, the heart is a muscle. But unlike the muscles you have in your arm, instead of squeezing to pick things up or hold things, the heart is a muscle that squeezes blood around your body. It's actually a lot like a squeeze toy, like when you're little and you play with a rubber duck in water. Think about it: when you squeeze a rubber duck, it squirts out water. And then, if you dunk it back into the water again and then you release it, it sucks water back in, right? Filling up again. And, now, it can squirt water again. Your heart is very similar to this. Just like a rubber duck is hollow and can be filled with water, your heart contains hollow parts on the inside that can be filled up with blood. We saw that when a duck gets squeezed, it squirts out the water—it's the same with the heart. When your heart beats and squeezes, it pushes out blood. Now, as you might guess, when the

heart squeezes, it doesn't just send blood squirting all over the place like this. Blood leaves the heart in tubes. They're what we call blood vessels. There are also blood vessels that bring blood into the heart to refill it. When the heart stops squeezing, it pulls blood in from those tubes, just like the rubber duck filled back up with water when you stopped squeezing it. Those blood vessels then go to all the different parts of the body that need blood. You've probably noticed before that you can even see some of the blood vessels in your own body, like if you look at the inside of your wrist or elbow. Each time the heart pushes blood through the blood vessels, that gives a little push on the vessel. That's called a pulse. You can actually feel blood moving through the vessels if you put your fingers on your wrist. There are blood vessels inside your wrist, so when you feel your pulse there, what you're really feeling is the push from your heart squeezing the blood into the blood vessels. That's what a doctor is feeling when they're checking your pulse. If a doctor wants to find out how fast your heart is beating, she doesn't have to look at your heart, like in a glass frog. Instead, she can just feel for your pulse. Each push of the blood is actually the beat of your heart. So, in summary, the heart is a muscle that pumps blood to all the parts of your body by squeezing blood into tubes called blood vessels. As the blood goes through all the vessels in your body, it pushes on them —that's your pulse. That's all for this week's question. Thanks, Kayla, for asking it.Text