mystery science

# Grades K-5
# Mini-Lesson: “What's the deepest hole anyone has ever dug?”

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# VIDEO TRANSCRIPT

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## VIDEO 1

Hi, it's Doug! I recently moved to Austin, Texas, and there are so many new things I'm looking forward to checking out. Now I moved here during the summer when it's really hot, so one thing I'm really looking forward to is visiting a swimming hole. Texas is famous for its swimming holes. These are naturally occurring pools of water, usually connected to an underground cave system. Like, check this out. This swimming hole is called Jacob's Well. Do you notice how dark it looks? That's because the bottom is over 140 feet down. But I've heard that water feels nice and cool on a hot day. Someone named Brayden has a question about holes in the Earth. Let's give Brayden a call now.

**[Video Call]**

- Hi, Doug!

- Hi, Brayden!

- I have a question for you. What is the deepest hole anyone has ever dug?

- Ooh, that's a great question.

People have been digging holes for a long time and for a lot of different reasons.

- Dig!

Some people dig holes just for fun, like this person named Ra Paulette. He's been digging holes for over 25 years. But not just any holes, check this out. Isn't that incredible? These holes he digs by carving into a soft type of sandstone rock are beautiful works of art. The amazing thing is, he digs them all by himself with no tractors, or machines to help. Some of them, like this one, are even homes you can live in with a bathroom and kitchen. So cool! But people don't only dig holes for fun. Thousands of years ago, people dug holes to live in, like the builders of this city in Turkey. It's called Derinkuyu, and it's the deepest city in the world. It's located as deep in the ground as a 20-story skyscraper is tall. No one lives down there now, but a long time ago, it could hold 20,000 people. Now, even though Derinkuyu is pretty deep, it's not even close to being as deep as this hole. This is the deepest hole anyone has ever dug by hand without the help of any machines. It's 1,285 feet deep. That's deeper than the Empire State Building is tall, and it wasn't easy to dig. The deeper the workers dug, the darker it got. And, they only had candles to light the way. But they kept digging day and night for four years, until finally, they found what they were looking for. Can you guess what it was? Water. The hole is called the Woodingdean Well, and it was dug to find water to drink. See, there's actually a lot of water under the ground, 100 times more water than all the rivers and lakes put together. So where water is needed, people dig holes to try to find it. But water isn't the only thing you can find when you dig. Sometimes, people also dig holes to find valuable resources, like silver or gold. That's what these miners in South Africa are looking for. The Mponeng goldmine is the deepest mine in the world. It's as deep as 10 Empire State Buildings stacked on top of each other. This hole is so deep, it takes miners over an hour on special elevators just to get to the bottom. And once they're down there, it's hot! At 140 degrees, it's hotter than the hottest day ever on Earth. That's

because the deeper you dig, the hotter it gets. Before I go on, I'm curious, besides looking for water or valuable resources like gold, what are some other reasons you think people dig holes?

## VIDEO 2

Well, I'm not sure how you answered, but you may be surprised to hear that the deepest holes on Earth were dug because people were just curious. They wanted to know what they might find way, way down, deep in the Earth, like this group of scientists in Germany. They were trying to reach a mysterious layer inside the Earth called the mantle. Using special drills, these scientists were able to dig a hole that went almost 30,000 feet deep. Now that's deeper than the world's tallest mountain, Mount Everest, is tall. It's called the KTB Borehole and it's the second deepest hole ever dug. But even though they dug pretty deep, they weren't able to reach the mantel. They did leave the hole open for people to visit though. If you're ever in Germany, you can check it out. Okay, if you think that's deep, remember I said that was the second deepest hole ever dug. This is the Kola Borehole in Russia. It is the deepest hole on Earth. Using special drills, workers dug for over 20 years and they got pretty far, seven and a half miles down. That's deeper than 30 Empire State Buildings stacked on top of each other. But don't worry, it's only about as wide as a dinner plate, so there's no way you can fall in. So, were they able to reach the mantle? Not even close. In fact, if the Earth were the size of an orange, then the Kola Borehole wouldn't even go past the peel. But why is that? Are the drills we use to dig just not long enough? Even though that makes sense, making long enough drills isn't the problem. The problem is heat. See, the closer you get to the mantle, the hotter it gets. It's so hot down there that normal drills can melt like ice cream when they go that deep. And it's not just the drills that melt down there, the rocks down that deep in the Earth are so hot that they start to act almost

like a thick, gooey liquid, almost, but not quite, as hot as lava. So it doesn't look like we'll be digging a hole all the way to the other side of the Earth anytime soon. Still, scientists are curious to figure out if there are new ways to dig even deeper. If this is something that interests you, maybe it's something you'll help figure out one day. But until then, it's important to know that digging deep holes on your own can be dangerous. So if you do try to dig, never dig a hole that's deeper than you are, and make sure you always have an adult nearby to supervise. That's all for this week's question. Thanks, Brayden, for asking it!