Grade 4
Unit: The Birth of Rocks
Mystery 1: “Could a volcano pop up where you live?”

VIDEO TRANSCRIPT

EXPLORATION VIDEO 1

This is lava. Wow, it's so awesome. This stuff is so hot. Anything flammable that lava touches, check it out. Instantly catches fire. Or see these tree roots burning as lava touches them? Lava is so amazing, think about what it is. It's a liquid. You can see here it's flowing. But it's rock, it's liquid rock. In order for rock to melt into a liquid, it has to be really hot, nearly 3,000 degrees Fahrenheit. Now lava, as you know, flows out of a volcano. Most of us don't live anywhere near a volcano, so it would be so awesome, it would be the trip of a lifetime to get to go near one and be able to see lava up close like this. But what if you didn't have to visit a volcano? What if a volcano came to you? Like what if a volcano erupted in your neighborhood? Hmm. That's just crazy. Could a volcano ever pop up in a place like a backyard or a park? I know what you're thinking, no way. But let me tell you a true story about a man who lived in Mexico in a small town called Paricutin. One day, February 20th, 1943, this guy, a man named Dionisio Pulido, was out in his fields with his horses, plowing the earth so that he could plant corn. But at four p.m. that day, there was a tremendous boom. The Earth shook. What happened? Dionisio went to look around and he found a large crack in his field, just like this one. Before long, lava began to squirt out of the crack. And by the end of the first day, there was no longer just a crack. Now the lava that cooled had started to form a hill about 160 feet high. This is a real photograph of

that volcano in Paricutin during its first few days. The townspeople gathered around to watch it erupt. How incredible, they thought, to see a tiny volcano forming in what was just yesterday a flat cornfield. The volcano kept erupting lava every day. After about three months' time, lava was now starting to flow closer to the main part of town. Everyone immediately left town to seek safety elsewhere. But as they turned back to look, that's when they realized there'd be no coming home. This wasn't like a flood, which eventually flows away. It was lava, and what does lava do when it cools? It hardens to rock. This is the town of Paricutin today. You can see that the town was buried. It was frozen in rock. All of this rubble here is the hardened lava rock, a type of rock which scientists call basalt. When the lava came through town, the intense heat burned down all the wooden buildings. So today, only a few stone buildings like this church are left. That's the top of the church poking through the basalt. So I ask you again, could a volcano ever pop up where you live? Maybe you say no way. But it happened to Dionisio Pulido. Are you sure it couldn't happen to you?

EXPLORATION VIDEO 2

Now there's something else I should tell you about the area where Dionisio Pulido lived. Earlier in history, people had recorded other volcanoes that had erupted in Mexico, like here and here and here and over here. Hmm, these volcanoes are all pretty close together. You know, they almost form a line. I'll call this a pattern, since it's like you could connect the dots. Now, as of right now, you don't know why volcanoes are found here. But with our pattern, it's like we could predict where another volcano might form. Look at this gap here. This spot is right in the middle of the pattern, between two other volcanoes. So it's not crazy to expect another volcano to form here. Sure enough, that's where Dionisio's town of Paricutin is located. A volcano formed there in his cornfield, which seemed kind of shocking. But when you look at the bigger picture, it really

makes sense. It's part of a pattern. So could a volcano erupt where you live? Well, surely all of the world's volcanoes aren't just over here in Mexico. But where are the other volcanoes? Suppose we had a list of all the volcanoes of the world and we marked them on this map. Do you think maybe we'd see an even bigger pattern?

ACTIVITY INTRODUCTION VIDEO

In this activity, your class is going to mark or plot volcanoes on a map. Then, you'll take that map and look for any pattern in where the volcanoes are located. We divided the map you'll use into four sections—Asia, Australia and nearby islands, North America, and South America. For each section of the map, we'll give you a list like this of 12 volcanoes that have erupted in the last few hundred years. You'll work with a partner to put those volcanoes on the map. Then you and your partner will answer some questions about where volcanoes tend to be. Finally, you and your classmates will put four finished maps together and see if you can find a larger world pattern to where volcanoes are located. Now, we'll take you through the activity step by step.

ACTIVITY STEP 1

Find a partner to work with. When you're done with this step, click the arrow on the right.

ACTIVITY STEP 2

Get your supplies. Each group needs one of the four maps and the volcano list that goes with it. Also get a pencil and a colored pencil.

ACTIVITY STEP 3

Look at the volcano list. Notice that each location is written as a number and a letter. On the map, there also numbers and letters. This is how you'll figure out where things go.

ACTIVITY STEP 4

With your partner, decide who will be the mapper and who will be the announcer. You'll switch jobs later. You have 15 seconds to decide who does what. Go.

ACTIVITY STEP 5

The announcer will read each location, then the mapper will find and draw it on the map as you see in the video below. Do the first one now.

ACTIVITY STEP 6

After you and your partner check your work, Announcer, mark that volcano off the list.

ACTIVITY STEP 7

Work together to do the rest of the volcanoes on your list. When you're done, ask your teacher for the Volcano Discoveries Worksheet, and answer the questions.

ACTIVITY STEP 8

Has everyone filled out a "volcano discoveries" worksheet? If not, do it now.

ACTIVITY STEP 9

Now, your teacher will collect the finished maps and put four together like this. As a class, discuss the question on the next slide.

ACTIVITY STEP 10

Discuss these questions as a class. When you're done, click the arrow on the right to watch the next video.

WRAP-UP VIDEO 1

When you brought your maps together, you saw something like this. Maybe you noticed that you could kind of connect the dots between the volcanoes. This pattern—this line of volcanoes around the Pacific Ocean, this is one of the Earth's major features. Scientists have a special name for it. It's called the Ring of Fire. We call it this because it forms a kind of circle of volcanoes around the edge of the Pacific Ocean. It resembles a ring, or you might say it's more of a horseshoe shape, but Horseshoe of Fire just doesn't sound as great. Now, we didn't have your class put every single volcano on earth on the maps because that would have taken hours. But even when we add the rest of the volcanoes on the map, like this, do you see how the Ring of Fire pattern still stands out? 75% of the world's volcanoes occur in the Ring of Fire. Why? Why do so many volcanoes occur in this ring? Well, there are scientists who travel to volcanoes to figure out answers to questions like this. They're called volcanologist. They have some ideas, which you'll learn more about in the future. One important thing to notice is that volcanoes always occur in clusters or groups. There hasn't ever been a case of a volcano just popping up in the middle of nowhere on its own. There's always a group of them. Even the volcanoes that

are outside the Ring of Fire are in groups, like these volcanoes, here, that form Hawaii. So could a volcano pop up in your backyard? You have some ideas now. It seems like it's going to depend entirely where you live. If you don't live along one of these patterns of where volcanoes are found, like the Ring of Fire, it seems like the chances are probably a volcano is not going to erupt in your backyard. But if you do live along the Ring of Fire, it's not out of the question. It happened to Dionisio Pulido in Mexico, and it's happening right now in other places. Let's zoom into the United States. Notice that in Southern California, right here, there aren't any volcanoes, but there are lots of volcanoes north of there and south of there. So could one pop up in Southern California? Well, let me show you something interesting. Even though there aren't any volcanoes in Southern California, there is this. It's about two hours from Los Angeles, near the Salton Sea. It's boiling mud and steam rising out of the earth. Mud doesn't normally boil, so scientists believe that there's lava that's under the surface, causing things to heat up. So far, nothing has happened, but a volcano could erupt in Southern California one day, just like in the cornfield in Paricutin, Mexico. Could it happen to you, too? Are there any volcanoes close to where you live? Have a look at this map and discuss.

WRAP-UP VIDEO 2

Let me show you one more surprise, a surprise in Virginia, USA, obviously very far from the Ring of Fire, which is off 2,000 miles away in this direction. And yet look at this rock that I found on a hill in Virginia. It's the same dark color as the lava rock in Paricutin. In fact, we could hold the two side by side and you can't even tell the difference. This rock from Virginia sure looks like basalt. But how could that be? Virginia isn't in the Ring of Fire. So could there really have been lava rock there? When we were talking earlier about the Ring of Fire, we were talking about active volcanoes, volcanoes that still erupt lava. But look again where I found the rock in

Virginia. Do you see this hill back there? Well, it's not just a hill. It's a dead volcano. Scientists call this an extinct volcano, meaning a volcano that doesn't erupt lava anymore. But at one point in the ancient, ancient past, it used to erupt lava. Grass has now grown over it, and most people driving by would have no idea. Underneath the grass, it's all basalt. So even if you don't live anywhere near the Ring of Fire, you can find extinct volcanoes and lava rocks all over the globe. It might even be possible for you to find a piece of lava rock near where you live. Maybe a volcano once erupted in your backyard, but it was just a long, long time ago. Give it a try. Go out and explore. See if you can find what you think might be a piece of lava rock or basalt near where you live. Have fun!