mystery science

Grades K-5
Mini-Lesson: “How are diamonds made?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Doug! When you think of crystals or gemstones, what do you think of? Rubies? Emeralds, maybe? Well, I like to think of these—some of the largest crystals in the world, and they were only discovered fairly recently in a cave in Mexico about 1,000 feet underground.

This week's question comes from someone named Adam. Let's give him a call now.

[Video Call]
- Hi, Doug!
- Hey, Adam!
- I have a question for you. How are diamonds made?
- That is a great question.

Well, it turns out that most diamonds aren't actually made at all—they're something people have to find. Diamonds are just one type of crystal or mineral. Here on Earth, we find so many different kinds. There are thousands of different kinds of minerals, usually found like this, where they're surrounded by, or stuck inside of, ordinary rock. And when we do find these different minerals, they almost always have these amazing shapes with lots of flat sides, like this. That's completely natural—that's how they look when they're found.

But some minerals are a lot rarer than others. They're harder to find. The rarest, most beautiful minerals are the ones that we call precious gemstones. These are minerals you've probably heard of—minerals like ruby, sapphire, emerald, and diamond.

Because diamonds are so rare and considered by many people to be so beautiful, they're worth a lot of money. The bigger and more beautiful-looking the diamond, the more it's worth. But even a diamond this size can sell for as much as $3,000.

Now, diamonds are really hard to find, but when they are found—like most minerals—they're found surrounded or stuck inside of ordinary rock. In the case of diamonds, usually, they're stuck inside a type of greenish-brown volcanic rock called kimberlite.

Part of why it's so hard to find diamonds is that there isn't a lot of kimberlite on Earth. When people do find kimberlite rock, they start digging, and searching, and digging, and digging, and digging. In most places on Earth where diamonds were found, you can see that people have created huge holes where they were searching for more.

But if diamonds are so difficult to find, could we actually make them instead of finding them? Well, you and I—we're definitely not the first people to wonder about that because if you could come up with some way to make diamonds, you'd probably get rich, right?

Over the years, lots of people have tried to make diamonds. But to even begin to try, first, you'd have to figure out what material diamonds are made of—is it glass? Some kind of really hard plastic?

VIDEO 2

Nobody could even begin to try to make a diamond without knowing first what diamonds are made of. Well, in the late 1700s, a group of French scientists did an experiment that figured this out.

They took a diamond and heated it up using a giant magnifying lens. They were shocked when they found out that, as they heated the diamond up, it turned into a type of gas called carbon dioxide. This is the same thing that happens when you heat a piece of charcoal. These scientists realized that diamonds and charcoal are made of the same material. It's a material that, in English, we call *carbon*—which is from the French word for charcoal.

So does that mean if you had a piece of charcoal you could turn it into a diamond? In theory, yes—that's exactly what it means, and people tried that for many years. But it never would seem to work out. They kept failing.

It turns out what's also needed is an incredible amount of pressure—like what you'd find deep in the earth. It wasn't until around the 1950s that we finally had the technology to create the kind of pressure needed to turn a piece of charcoal into a diamond.

Even today, the machines we have—which can create incredible pressure—can only create very small diamonds. But, scientists have recently discovered a different method of making diamonds—one that doesn't need a lot of pressure.

It could be that in the future, as this technology gets even better, diamonds won't be something rare at all—not if we can make them.

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