mystery science

Grades K-5
Mini-Lesson: “Where does metal come from?”

VIDEO TRANSCRIPT

Hi, it's Doug! I've got some coins here. I collect coins. You probably know this one. It's a one-cent coin—it's a penny. This one here is a $20 coin. Different coins are made out of different metals. This one is made out of silver. This one is made out of copper.

Someone named Kadielynn has a question for us about metals. Let's give her a call now.

[Video Call]
- Hi, Doug!
- Hi, Kadielynn!
- I was wondering, where does metal come from?
- That's a great question.

Have you ever thought about where metal comes from? It's interesting. Think about it—metal is all around us. It's in chairs and desks, and buildings, and cars, and buses, and it's in coins. But where does metal come from? Do you have any ideas?

Now would be a good time to pause the video if you want to stop and discuss.

Okay. You ready?

So where *does* metal come from?

Well, you might have some idea that metal comes from the earth. That's true, but what does that mean? Like, are there chunks of metal in the ground? Is that what these machines are digging out? Well, for some metals, the answer is yes.

Gold is an example of a metal that can just be found in the ground. Here you can see someone panning for gold in a river. They're sifting through the sand in the river and finding little pieces of gold. Now, just finding chunks of metal like this—pure metal from the ground—is really rare. It's very uncommon. Most metals cannot be found the way that gold can, just waiting in the ground.

And that's because most metal is hidden. It's hidden inside of rocks—and not just any rocks. Metal can only be found in special kinds of rocks, like the ones you see here. Each of these rocks is called an ore. These red ones are iron ore. They contain the metal iron. The blue-green ones—they're copper ore. They contain copper metal. Here's a close-up view of some copper ore.

Now, when I say that ore contains metal, you might think that means that if we crack the rock open, we'll find metal inside of it. But it doesn't quite work like that. You can keep breaking this copper ore up into smaller and smaller pieces—you're never going to find copper in there. That's because the metal is actually part of the ore. It's in the whole rock, all throughout it. It's almost like the metal is hiding right in front of you.

And in order to get the metal out of it, the ore has to be transformed by heat—*lots* of heat. You have to put the ore in an oven.

Now, you wouldn't be able to do this at home with the oven in your kitchen, because your oven doesn't get nearly hot enough. We're talking about heating up to thousands of degrees. In order to get metal out of ore, you have to put the ore in a special furnace—a type of oven that can get thousands of degrees hot.

It gets so hot that the metal becomes a liquid and separates from the rock. You can see here it's so hot, it's glowing. It looks like lava. The people who do this work have to wear special clothes to protect them from the heat.

So ore is changed—it's transformed into metal by heating it in a furnace. Then, once the metal is in its liquid form, it can be poured out into different shapes to make everything from bolts and paper clips to car parts.

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