mystery science

Grades K-5
Mini-Lesson: “How do erasers erase?”

VIDEO TRANSCRIPT

VIDEO 1

Hi, it's Jay! Have you ever thought of how cool pencils are? I mean it. There are so many amazing things you can do with like write stories and draw pictures. You can even make art out of a pencil itself. Check this out. Artists have figured out ways to make tiny sculptures out of the tip of a pencil. So cool. Matthew and Lily are curious about the other end of a pencil, the part that can save you from mistakes. Let's give Matthew and Lily a call now.

[Video Call]

- Hi, Jay.
- Hi, Matthew. Hi, Lily.
- We have a question for you. How do erasers erase?
- That's a great question.

But before we answer it, we kind of have to understand how a pencil actually works. This is the tip of a pencil up close, the part that you write with. It's made out of something called graphite. When we write, tiny flakes of that dark graphite get left on the page. And that's what's making the pictures we draw and the letters we write. Now those tiny flakes of graphite don't just sit on top of the paper. They get stuck on the page. And that's a good thing. Can you guess why? Well, if the tiny pencil flakes didn't stick, our words would just blow off the page if there was a breeze or fall onto the floor if someone shook our desk. That would definitely be a bummer, but

sometimes those stuck pencil flakes can be a problem. Like when we make a mistake and want to start all over. Luckily for us, we have erasers. Erasers have a way of taking our mistakes off the page. Poof. But how does that even work? Before I go on, I'm curious. How do you think erasers erase?

VIDEO 2

Let's think about this a little. We know that the pencil flakes are stuck to the paper. So if we want to raise them, We need something that will loosen them. But what can loosen stuck pencil flakes without ripping the page? Believe it or not, a long time ago, people used this to erase mistakes. Yep. You're not seeing things. This is a piece of bread. People would use bread and use it like an eraser, and it would work. Well, sort of. It was kind of sticky, so it could pick up some of those pencil flakes off the page, and it was also soft so that people could use it to rub off the flakes without tearing the paper. But using bread as an eraser also caused some problems. Can you guess what they were? Well, for one thing, bread can fall apart and it can also get all moldy and gross. What a mess. Whenever we describe the things we can observe about something, like how big or small or how sticky or soft it is, we're talking about its properties. And from what we can observe, Bread has some properties that work well as an eraser. And some that definitely don't. People had to find a better material to erase, and eventually they figured out just the right thing. Can you guess what it is? It's rubber. The same thing that bouncy balls and tires are made of. Rubber actually got its name from how well it can rub mistakes off of paper. And most of the erasers we use today are made out of it. Rubbert is soft, so it doesn't rip the page when you erase. And it has a special property that makes it great at pulling tiny pencil flakes off the page. Do you want to know what that property is? Rub your hands together really quick like this.

Do you feel them getting hot? That heat is what helps an eraser work. When you rub your eraser on the paper, it gets hot too, and that heat makes the rubber sticky. So sticky that the tiny pencil flakes on your paper stick to it and get pulled off the page. You can actually see the dark pencil flakes the eraser has picked up after you erase, but stickiness alone can't get all of the flakes Some of the flakes are really stuck, and they need to be scratched free from the paper before the eraser stickiness can work. One solution was to add rough and scratchy ingredients to the soft rubber, like ground up Pumice rock, adding rough and scratchy materials to erasers help scrape up and loosen the stuck pencil flakes, kind of like sandpaper. That way, the stickiness of the rubber can pick them up off the page. Oh, and you know those dark pieces of eraser on your paper after you erase? Those are the tiny pencil flakes stuck to the pieces of rubber from your eraser. Pretty cool. There are all sorts of erasers today. Eracer shaped like animals, And desserts, there are even erasers shaped like your favorite characters. It doesn't really matter what they look like. What's important is that they have the right properties. They need to be scratchy enough to loosen the pencil flakes from your paper, sticky enough to pick them all up, and soft enough to not rip your page. That's all for this week's question. Thanks for asking it, Matthew and Lily.