mystery science

Grades K-5
Mini-Lesson: “Could you make a real house out of cookies and candy?”

VIDEO TRANSCRIPT

VIDEO 1

Hey, it's Jay! I've always been curious about how things are built. So as a kid, I signed up for engineering camp. I imagined designing skyscrapers and bridges, but when I got there, they handed me marshmallows and uncooked spaghetti. Building with those materials was challenging, but fun. Maybe you've built something similar. Someone named Zeeshaan has a question about building with unusual materials. Let's give Zeeshaan a call now.

[Video Call]

- Hi, Jay.
- Hi, Zeeshaan.
- I have a question for you. Can you make a real house out of cookies and candy?
- Oh, great question.

Maybe you've played a game like Candy Land before, competing to reach a Candy Castle. Or maybe you've enjoyed other stories with candy kingdoms or incredible edible rooms. But could we build places like these for real? I mean, imagine having a slice of a staircase or nibbling on a door knob. I'm curious. What sweet treats would you choose for building a house?

VIDEO 2

People have built some amazing things out of sweet treats, from castles and bridges to skyscrapers and miniature cities. The main material for these creations is a cookie you might know: gingerbread. Gingerbread starts out as a dough that's soft and squishy. You can call those its properties. Properties are things you can notice about a material, like how this dough can be cut into different shapes. Once it's baked, though, gingerbread has different properties. It becomes hard and stiff. Those are properties that help it stand up to make things like a wall. Now, I'm curious about the sweet treats you imagined. Those treats have properties too, and you might be able to build with them in different ways. The same way real building materials are good for different jobs. Take this licorice stick and this peppermint stick. They've got a similar shape, but the licorice has the property of being flexible. It can bend and spring back. This metal cable does something similar. It's used on structures like suspension bridges that need to bend and move without breaking. The peppermint stick doesn't bend. It stays stiff and straight. That could work well for holding things up like this stone column does. Or check out this bar of chocolate. It's hard and solid. If you push on it, it doesn't squish down. Those properties inspired the staff at a chocolate shop in Brazil. They wondered if you could stack chocolate bars like real bricks. Turns out, you can. They stacked dozens and dozens of chocolate bars to build a chocolate cottage that's big enough to stand inside. And remember those gingerbread creations? Well, this is the record holder for world's biggest gingerbread house. Bakers in Bryan, Texas, made thousands of gingerbread panels. Then they sprayed on sticky sugar icing to hold them in place. That's real icing you can eat. It's definitely big enough to be a house, but I have to be honest. It's not all cookies and candy. First, a concrete base wooden frame and roof were built. Then the gingerbread and icing were added on top. Maybe you can guess why they

had to build it that way. You know that houses are often built from materials like wood, bricks, concrete, and metal. Think about their properties. They're strong, solid, and hard. You have to really push or pull to break them. Plus, their properties stay strong and solid in different kinds of weather for years and years. But can you imagine that chocolate cottage outside on a really hot day? Yikes. Total meltdown. Or think about dunking a cookie in milk. You know how it soaks it up and gets soggy? That's usually delicious. But not if it's your house, that giant gingerbread house had to be wrapped in plastic each time it rained like a giant raincoat. Without that extra protection and the wooden frame holding it up inside, it would have become a soggy crumbling mess. And even with that help, it could only stay up for a few days. Then it was taken apart and all the wood was donated to help build real homes. Clearly, building a cookie and candy house comes with challenges, but it's so great to imagine how you might do it. In fact, it's the kind of creative thinking that helps us come up with new building materials. By being curious and experimenting with unusual materials, engineers have invented some surprising things, like this clear square. It's actually wood you can see through. And this path soaks up sunlight during the day so it can glow at night. Food can be a big source of inspiration for new materials. Engineers have tested orange peels, cabbage leaves, and even lunchbox leftovers to try to create a new kind of cement. It has the properties of being strong and hard, like typical cement, but making it would create much less pollution. Plus it helps recycle food waste. And because it's made entirely from food, you could actually eat it. You can't just chop down though. Food cement would have to be broken into pieces and boiled in water first. Still, engineers are already dreaming up ways to add scents and flavors. For now, they're making small items like plates see how well food cement works. But in the future, maybe you really could have a house made of food. And you could become an engineer who invents new materials with amazing properties that make it possible. That's all for this week's question. Thanks, Zeeshaan, for asking it.