The Science of Lunch: Crash Course Kids #15.2

Physical Science
https://youtube.com/watch?v=dN2VDcmuTl4
https://nerdfighteria.info/v/dN2VDcmuTl4

===== Introduction =====

You know what the worst part of lunch is? When it's over. Then I'm left with an empty brown paper bag, boo! But even an empty bag is useful to science, so yay! Why? Well it's brown and it's paper, and just by saying these two ordinary words, we've already begun exploring this bag's properties - it's physical characteristics that we can use to describe matter.

You already know that some properties have to do with what state the matter is in, and that some properties have to do with light, like reflectivity or transparency. But that's not the end of the matter, so to speak. So let's explore some more. What are some other properties of matter?

===== Big Question =====

How about hardness? That's the measure of how difficult it is to scratch or crush a certain type of matter. Rock, concrete, and some metals are hard kinds of matter, while soft matter includes things like liquids, gels, and foam. In short, if you don't want it as a pillow, it's probably hard matter.

If you've even played with Play-Doh, then you're already an expert in malleability - how easily matter can be shaped into different forms. Things that bend, stretch or can be rolled thin are malleable, while things that are brittle and snap when you try to change their shape are not. Play-Doh, malleable. A crayon, not so much.

If you like music, then you might know what a conductor is. It's a person who leads a group of musicians, and some kinds of matter can lead things too. Not in making music, but in leading energy from one place to another. Conductivity is the measure of how easily matter transports heat or electricity. Metals tend to be very good conductors, while plastic, wood, and oven mitts are not.

And now for what's maybe the most attractive property of matter: magnetism. You can test this property simply by seeing if a magnet sticks to a certain type of matter. Some types, especially metals like iron, react strongly to magnets. But wood and plastic don't attract magnets, so if you're looking for a place to hang your artwork, the fridge door, which is made of metal, is a way better option than the tree in your yard.

It's important to understand that these properties are used to compare matter. Some types of matter have these properties more than others, while other kinds of matter might not have them at all. Now, let's see these ideas in action by comparing the properties of some lunch-timey things!

===== Investigation =====

We'll start with hardness. If you try and make fingerprints in a piece of sandwich bread and an apple, which will you find to be harder? Right, the apple! Now which do you think will be more malleable? A fruit strip, or a potato chip? Right, the one that doesn't shatter and make crumbs everywhere.

For conductivity, we can test the ability of a water bottle to conduct heat, because we are not playing with electricity, ever. If I put some nice hot cocoa in a metal bottle and some in say, a plastic one, the metal one will feel warmer. This is because the metal has conducted the heat from the hot cocoa to the outside of the bottle. And as far as magnetism, let's take a magnet and see where it sticks, to the empty brown paper bag, or the metal water bottle. Clearly, the metal bottle is more attractive.

===== Conclusion =====

So, in addition to properties like freezing and boiling point, or transparency and reflectivity, matter also has properties that have to do with its ability to be changed into new forms, like hardness and malleability. And properties that have to do with its ability to carry heat, like conductivity, and its ability to attract magnets, called magnetism.

So you got an extra helping of science with your lunch today. But science is not an excuse for playing with your food at the lunch table. I mean, if you're going to test the properties of your lunch, just be sure to clean up after yourself, okay?