(LEGO) Block Party: Crash Course Kids #23.2

Physical Science
https://youtube.com/watch?v=V6D5UvJv1Zo
https://nerdfighteria.info/v/V6D5UvJv1Zo

Intro Music

===== Introduction =====

Sabrina: Oh, hi there! Yeah, you caught me. There's nothing that says big kids can't play with LEGOs too. But you know, these LEGOs are business related. Being the "science-y" type, I can use them to learn about things like, mass.

Like if I measured the mass of all these LEGOs separately and then compared them to the mass of the building, or the dinosaur, or whatever I make when I put them together, then I find that the masses are always the same. But you already knew that, because you remember all about the conservation of mass. The rule that says mass is never made or lost.

We tested that rule out by making matter go through physical changes, like mixing it into a solution. But what about chemical changes, like those things that happened during our cake-baking adventure? Does conservation of mass apply there?

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

You know that during chemical changes, the particles that make up two or more substances become rearranged to make a new substance. And then there are things that give us clues that a chemical change is occurring, like a change in temperature, or lots of bubbling, or maybe even a flash of light.

You also know the special names that scientists give the substances that take part in a chemical reaction. The reactants are the substances that you start out with. That's the stuff that's made of the particles that get rearranged during the chemical reaction.

And the new substance that gets made? That is the product. And I bet we can show what happens during a chemical change by using my LEGOs. See, I knew I'd have an excuse to play with these!

If we pull the cubes apart, mix up the LEGOs, and build something funky-shaped from the exact same blocks that made up the cubes, that's our product. Well, I did say funky-shaped.

Notice that it's made of the same LEGOs as the original cubes, they've just been rearranged. It makes sense that the mass of this new product would have the same mass as the original reactants, right? Because they're made out of the exact same stuff. Ready to test that out? Okay, let's get experimenting.

===== Investigation =====

But instead of playing with LEGOs this time, let's mix two liquid reactants, substances that sound terrible together - vinegar and cream.

We'll measure the mass of each liquid and record those in a table. Next, we'll stir them in the same bowl. Gross? Maybe. A good example of the conservation of mass? Definitely. The two reactants mixed together made a new substance. That disgusting goop is curds, a solid product that can't be turned back into two liquids.

So boom! That's the chemical change. And the solid product that it forms has the same mass as the two liquid reactants, which we will now note in our trusty table.

Now the mass would still be conserved, even if the chemical reaction makes products that aren't solid. Like if we were to mix a little bit of vinegar with baking powder, it would make a lot of bubbly foam, which is caused by a release of gas. And gas, if you remember way back to our bouncing balloons experiment, is matter and has mass.

No matter what state the products are in, if you add up the mass of all of the products, it will always equal the mass of all of the reactants.

===== Conclusion =====

So, the mass is always conserved, or saved. It never goes away. And as we saw in our vinegar and cream experiment, chemical changes - like physical changes - follow the conservation of mass. That scientific rule that says matter can't be made and can't just disappear.

Okay, now that the business part is over, Imma build me a Velociraptor. It'll be fine.

Outro Music