Ready, Set, Fizz

Which fizzes faster?

Try this!

1 Take a look at the graduated cylinders. What do you notice about the two tubes? Do you think they'll react to the water in the same way?

2

At the same time, pour the water from each measuring cup into a cylinder. Which fizzes faster, the tablet that was broken into just two pieces or the one that was crushed into lots of little pieces?

The crushed tablet fizzes faster than the halved tablet because it has more surface area. When things get smaller they can behave in surprising ways!

What's going on?

The crushed tablet fizzes faster

Both tubes have the same amount of medication, but the crushed tablet fizzes faster. That's because it has a greater *surface area to volume ratio.* For the same amount of antacid, the crushed tablet has more surface—or exterior—to react with the water. Because the water can reach more of the antacid immediately, the chemical reaction (fizzing) happens faster.

Small things have more surface area for their volume than larger things do. Some things that aren't reactive at all in big pieces are very reactive when they're tiny. For example, nano sized particles of aluminum are explosive. Good thing regular sized aluminum doesn't explode, or it would be dangerous to drink soda pop!

How is this nano?

A material can act differently when it's nano-sized. Things on the nanoscale have a lot of surface area, so they react much more easily and quickly than they would if they were larger.

Some packaging uses extra-sticky glue

Nanotechnology takes advantage of the way things behave differently at the nanoscale to make new products and applications. For example, extra-sticky glue can be made from tiny starch molecules that are only 100 nanometers in size. This eco-friendly adhesive is used to stick graphics onto cardboard packaging.