



READY, SET, FIZZ!

Surface area effects chemical reactions.

Materials

- 4 Clear Cups
- Effervescent (fizzing) Antacid Tablets
- Water
- Food Coloring

Procedure

- Fill two of the cups halfway with water. Put the same amount of water in each cup.
- Add a drop of food coloring to each cup.
- Remove two antacid tablets. Drop one into one of the empty cups. Crush or break the other tablet into many small pieces and put it in the other empty cup.
- Pour the colored water into both of the cups containing the antacid. Make sure you pour each cup at the same time. Which fizzes up faster?

Some modern medicines have been adapted to have a slower chemical reaction so that the medicine is slowly released into the body. If you were to crush up this kind of tablet it would release all of the medicine very quickly, which could be harmful.



Results

The crushed tablet fizzes faster than the whole tablet. That's because it has a greater surface area to volume ratio.

Why?

For the same amount of antacid, the crushed tablet has more surface to react with the water. Because the water can reach more of the antacid immediately, the chemical reaction (fizzing) happens faster.

A material can act differently when it's nano-sized. A nanometer is a billionth of a meter. 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. 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!