

DIAPER DISSECTION

💡 BIG IDEA

Learn how diaper polymers work. See if they make a gel, snow, or something else when combined with water, and measure how much water they can hold.

READY...

Gather materials:

- bowl (optional)
- disposable diapers (2 different brands)
- notepaper
- pencil
- 2 plastic cups (9 oz.)
- plastic spoon
- scissors
- water

SET...

Pour water into one of the cups.

GO!

1. Label one cup "A," and label the other cup "B."
2. Carefully cut or rip through the first diaper, Diaper A. It is best to use the seams at the side of the diaper. Notice how much padding and what type of padding is in the diaper.
3. Use a plastic spoon to scrape down the cotton and outer coating and then to carefully pull out the crystals to put in the cup. The crystals will be tiny—the size of sand. As you get to the powder, try to put as much of it into Cup A as possible. You don't want any of the stuffing, just the powder!
4. Once you have cut through the whole diaper and gotten as much of the powder as you can, use your plastic spoon to slowly add water to Cup A. Count the number of spoonfuls of water you add. Write this number on your notepaper.
5. Repeat this process to gather information about your second diaper, Diaper B. Write down the number of spoonfuls of water you add to Cup B.
6. What did you notice happening when you added water to the powder in each of your cups? Did the powders react differently? Which cup held the most water?



Cutting open a diaper



Extracting polymer crystals

[continued from front]

WHY IS THIS SCIENCE?

The powders in disposable diapers are generally a chemical called sodium polyacrylate, which is often called “diaper polymer.” It works by soaking up urine and turning it into a gel.

Sodium polyacrylate is a hydrophilic substance, meaning that it loves water. It can absorb a lot of water—and it absorbs it in a different way than a towel would. When towels soak up water, the water molecules stay the same and just get stuck in the fabric of the towel. When sodium polyacrylate absorbs water, it’s actually a chemical reaction. The water molecules join the sodium polyacrylate molecules and make a new (and bigger) chemical.

There are different types of sodium polyacrylate. Some of them puff up into small chunks when they react with water. These polymers are sometimes used to make artificial snow. And some of them stick together and make a solid gel, like the diaper gel.

WITH THANKS AND FOR MORE INFORMATION, VISIT:

This activity has been adapted from “Diaper Discussion,” *Experiencing Chemistry*, Oregon Museum of Science and Industry (http://www.oms.edu/sites/all/FTP/files/chemistry/Side_Displays/U5DiaperDissection_OpGuide.pdf).