

# The Curious Connection Between Corn & Diapers

(Making superabsorbent polymer ice packs) - *Activity Outline*

1. Show participants a **clear plastic cup containing ½ tsp. of superabsorbent polymer powder** . Ask if they can guess what the powder is.
2. Explain that adding water to the powder and seeing how it behaves might give clues as to what it is. Ask what they think might happen. Will the powder sink? Float? Dissolve? Fizz? Explode?
3. Pour **¼ cup of water** (containing blue food coloring for visibility) into the cup. Swirl the cup as if to mix in the powder.
4. “Wow! NOW what do you think this powder is?”
5. Explain:



“This is a superabsorbent polymer. The first superabsorbent polymer was invented in 1973 by scientists at the USDA lab in Peoria, IL, using corn starch!

Today, the technology invented by those scientists is used to make superabsorbent polymers from cornstarch or synthetic materials.

THIS polymer is not made with cornstarch. But it wouldn't exist without those scientists who were experimenting with cornstarch in the first place.

So, this is really cool, but who cares? Can you think of a way that a substance that absorbs hundreds of times its own weight in water could be used? Where would we want to be able to quickly soak up a lot of liquid?

Do you have a baby brother or sister? Does he or she wear something that absorbs liquid? You're right —a diaper!”

6. Show a diaper that has been cut in half and placed in a clear bag. Point out white powder that has fallen out of the diaper.
7. “Another way superabsorbent polymers are used is in ice packs. The gel stays colder much longer than plain ice.” **Add more water** to the gelled contents of the cup so that it is full. Stir gently to show how the added liquid is quickly absorbed.

8. Dump the gel into a labeled 5x5" or 5x7" reclosable bag. Add more water to the bag, carefully press air out of the top, and close firmly. Give the finished ice pack to a waiting participant.

## Supplies

Superabsorbent polymer powder (see <https://www.teachersource.com/product/sodium-polyacrylate-diaper-polymer>)  
5x5" or 5x7" 6 mil reclosable bags (see <https://www.royalbag.com/5-X-7-6-Mil-Clear-Reclosable-Bags/product/1322>)  
Weatherproof labels (see <https://www.onlinelabels.com/products/ol996lp>)  
Jugs of water  
Blue food coloring  
Pitcher  
1 cup liquid measuring cup  
½ tsp measuring spoon  
Several clear, 9-oz cups (see <https://a.co/d/ifbxtDj> or similar)  
Paper towels

Label design file - <https://bit.ly/3zEaEYI>

## More information

- USDA-ARS BREAKTHROUGH “SUPER SLURPER” LAUNCHED ABSORBENTS INDUSTRY (video) <https://youtu.be/rSheYFxtEKk?si=UoUNdUTVdR6QcoeT>
- One Team, One Product — Many Uses <https://agresearchmag.ars.usda.gov/1996/may/starch/>
- Super Absorbent Polymer for Manufacturing Gel Packs <https://ipcpack.com/products/super-absorbent-polymer-gel-packs/>
- Science Fair Project: Super Absorbent Polymer <https://prezi.com/im7idaei7xka/science-fair-project-super-absorbent-polymer/>
- Science project: Can superabsorbent polymer crystals absorb any other liquids besides water? <https://www.education.com/science-fair/article/Hydrogel-superabsorbent-polymer-crystal/>
- Innovative Cornstarch Makes Products Sustainable and 'Green' <https://www.ars.usda.gov/news-events/news/research-news/2019/innovative-cornstarch-makes-products-sustainable-and-green/>