

Making Artificial Snow

Grade Level: 6-12

Introduction:

If you're spending the winter in Georgia, chances are you won't see very much snow. We can play with our own artificial (fake) snow created from disposable baby diapers! Companies, such as tourism and film production, invest money in creating fake snow. This fake snow is usually created by mixing water with a polymer to create a white, fluffy, wet powder similar to the real stuff.

Real World Connection:

The fake snow made in this activity uses a *polymer* to create a wet, white powder. Polymers are likely best known as the “building blocks” of plastics, and are still the subject of scientific research and engineering. [Check out these amazing magnetic polymers that can change shape from the use of magnets created by GT researchers!](#)



Vocabulary to Know:

Polymer – a big molecule made up of repeating pieces

Structure – in this activity, this word refers to the arrangement of atoms in the snowflakes

Melting point – the temperature at which a substance changes from a solid to liquid

Decompose – the breaking down of polymers and plastics into smaller and smaller pieces over time

Activity 1: Making Fake Snow

Materials:

- Scissors
- Disposable baby diaper
- Medium-large sized plastic container or Ziploc bag
- Water (tap water is fine)

Instructions:

1. Use the scissors or ask a parent to cut apart and open the bottom part of the diaper. You want to get the fluffy white “cotton” looking substance of the part of the diaper that is absorbent. Place this into your plastic bag or plastic container.
2. Add a little bit of water and mix with your hands (*Note, the chemicals in diapers are non-toxic and safe to handle with your hands. Be sure to wash your hands well after this activity!*). You'll begin to notice that the water is being absorbed by the white fluffy substance.
3. Keep adding water and mixing until you've reached your desired level of wetness.

Continued.

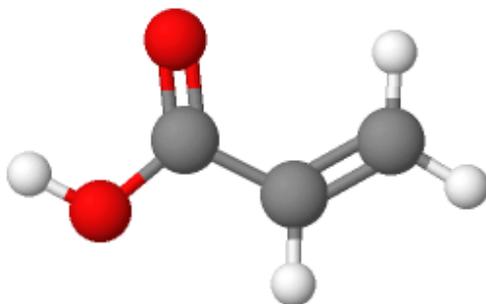
4. Play around with the snow! While playing, do you notice anything interesting about this snow versus the real stuff?
5. When you're finished, throw the snow away – **don't wash it down the drain!** Take care to wash your hands well.

Exploration Questions:

- How was this fake snow different than the real stuff? Does it look different? Does it feel different?
- Leave the snow out at room temperature for two hours (out of reach of pets or small children!). Do you think it will melt? Did it melt? Why do you think it didn't melt?

Explanation:

The snow made in this experiment is created when *sodium polyacrylate*, a water-absorbing polymer found in diapers, absorbs water to form a wet, white powder that resembles snow. Real snowflakes are simply frozen water molecules held together in a particular structure that forms the distinct snowflake shape. Instead of freezing water molecules, this fake snow is made up of water that is held in large polyacrylate polymers made up of thousands of *polyacrylate* segments.



3D model of polyacrylate, molview.org

The structure of the thousands of polyacrylate units makes the powder resemble real snow. But, unlike real snow, this fake snow won't melt at 32 degrees Fahrenheit or 0 degrees Celsius. Because it is a polymer, similar to plastic, its melting point is much higher than that of water. Instead of melting, this snow will "disappear" through decomposition. Over time, with exposure to the elements (namely sunlight), the polymer will break apart into smaller and smaller pieces. Over time, this will release the water – with enough time, this snow will appear to have melted and will no longer be recognizable. Some polymers take decades or hundreds of years to decompose. Thankfully, this polymer doesn't last as long as other polymers do and breaks down fairly easily!

Additional Resources:

- [Learning Resources – Polymer Division of the American Chemical Society](#)
- [University of Akron Global Polymer Academy resources](#)
- [Plastics Make it Possible](#)