

# Snow Day Soda Slushy

This activity works best when there's a lot of snow and it's very cold outside!

## Collect

- 16.9 oz. plastic bottle of soda (only use plastic, never glass!)
- Small metal bowl
- Snow or freezer



## Chill the soda

1. This experiment is best done outside. Shake the soda as much as you can to build pressure inside the bottle. Don't open the bottle!
2. Set the bottle upright in a big pile of snow. Pack snow all around and make sure the bottle is covered completely. *\*\*This experiment works best if the temperature outside is 20° Fahrenheit or less! If it's not that cold outside, you can always try placing the soda bottle in your freezer instead of in the snow.*
3. Leave the soda in the pile of snow or freezer for 3 - 3 1/2 hours.
4. Place a metal bowl in the snow or freezer and allow it to chill for the last hour.
5. Remove the metal bowl and the bottle of soda from the pile of snow.

## Pour an instant slushy

6. Very gently, without disturbing the soda too much, unscrew the lid and remove it from the bottle. Slowly pour the liquid into the metal bowl and watch what happens.
7. Grab a spoon and enjoy your snow day slushy!

## What's happening?

You created a supercooled soda. A supercool liquid is cold enough to want to freeze, but needs a trigger to actually turn into a solid. The trigger in this experiment is the frost on the metal bowl. When you pour the liquid into the bowl, the frost acts as a nucleation site - a place for the ice crystals in the soda to start forming. As soon as a few crystals form, the reaction speeds up and quickly freezes the rest of the soda. This is similar to the type of nucleation that occurs during the popular "Mentos & Diet Soda" fountain experiment. The Mentos candies are covered in tiny little bumps that act as nucleation sites for carbon dioxide bubbles to form rapidly.

## What if it doesn't work?

Since the actual temperature and amount of snow will be different for everyone, you may have to make a few changes to this experiment to get it to work right for you. Here are a few common issues and helpful suggestions:

- Did your soda turn to slush inside the bottle as soon as you opened the lid? Sometimes when you open the soda it releases just enough carbon dioxide bubbles to cause the ice crystals to start forming immediately. You should still be able to squeeze your slushy out of the bottle.
- Did your soda freeze solid inside the bottle? The soda may have been left in the snow too long. Try chilling the next bottle for a slightly less time.
- Did your soda remain a liquid after being poured into the bowl? The soda or the bowl was probably not cold enough. Try it again, but leave the bottle and bowl in the snow a little bit longer.

