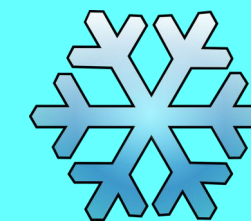




# Instant Ice



Adding more Ice to the arctic one water bottle at a time | Sofina Hibbeln

## Hypothesis

If water get near or at the freezing point, but without solidifying then when hit with a harsh force, it will turn to instant ice because the formation of ice crystals happens very quickly but heat flows slowly in water.

## Conclusion

Overall, When creating instant ice, the ice must remain at almost freezing for 10 minutes after being in the freezer for 3 hours. It tuned to instant Ice because the formation of ice crystals happened very fast, but heat flows slower in water. Through this project I learned about different types of Ice formation, and also about why the artic is melting.

## Further Research

Instant ice, If water (water bottle) is cooled to the right temperature it will instantly freeze when you apply a force of pressure (Hitting it on the table, punching the water bottle). Also If you keep it liquid, and do not apply pressure you can put ice cubes in a bowl and simply pour it on top of them and it will turn instantly to slush, that is completely edible.

## Major Findings

When water freezes, the molecules come together and form a crystalline structure. Because of this, water molecules as ice have less energy than water molecules as liquid. That means to go from liquid water to solid water, the molecules have to lose heat energy. In other words, as super cooled water freezes when you tap it or open it, it also warms up the rest of the water. This heating may allow only ten or twenty percent of the water to freeze and that accounts for slush being in the bottle instead of it being a solid chunk. The formation of ice crystals happens very quickly but heat flows slowly

## Key Concepts

The arctic is currently and had been in a state where, arctic temperatures are rising, and ice is melting. The ice is melting the fastest it ever has, and it is causing many different climate changes, that are not helping the environment. Overall the arctic ice is melting at a pace it never has before. Climate change and wind patterns are changing all the time. The arctic has lost approximately 13-14 square miles since 2000.

## Scientific Background

Ice Formation:

When the arctic water begins to freeze, small needle like crystals form called frazil. The crystals are mostly pure water because salt doesn't freeze. When these frazils bond together forming a sheet of ice, when they are formed they form a smooth piece of Ice called Grease Ice (Because it is smooth and slippery) Then the ice continually forms to form a sheet of ice called nilas, the ice becomes lighter as the ice grows thicker. Sometimes currents or wind can push the pieces of nilas together, this is called Rafting.

## Is it Possible to Create Instant Ice?

This is an experiment to see if it is possible to create instant ice by applying pressure to a water bottle that has been in the freezer for 3 hours and has not frozen but just barley at the freezing point, when hit with a hard force the water will instantly freeze.

D.V - Temperature in Celsius

	Trial 1			Trial 2			Average		
	Before	After	Ice	Before	After	Ice	Before	After	Ice
Still	25	4	0	25	5	0	25	4.5	0
	Trial 1			Trial 2			Average		
	Before	After	Ice	Before	After	Ice	Before	After	Ice
Sparkling	24	3	-1	25	4	-1	24.5	3.5	-1

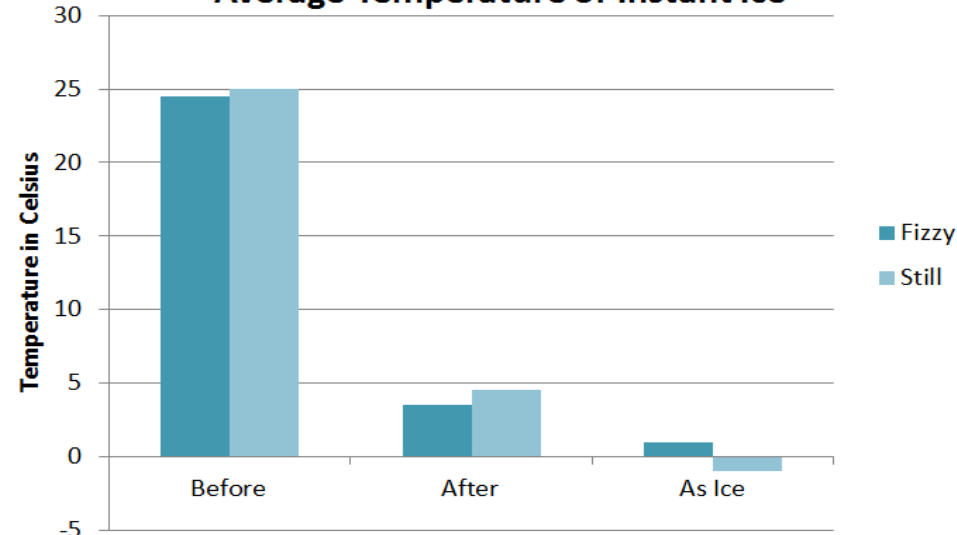
## Procedure

1. Burry two water bottles in a bucket of ice
2. Stick the thermometer inside and monitor the temperature, water should be around 0 degrees.
3. Must stay around 0 degrees at all times, if warms up add more ice and salt, it cooled down to much add warm-ish water.
4. After about an hour, watch bottles for ten minutes and make sure they stay at exactly 0 degrees for ten minutes (if bottles begin to freeze take them out and start again)
5. After that take them out, water should be still liquid.
6. Hit sharply against hand table or something solid
7. The water bottle should instantly freeze solid
8. Record results (did it work, did it not? What was the final temperature of the ice in the bottle?)
9. Compare the Two using percent differences

## Material List

- Ice
- Bucket
- Bowl
- Thermometer
- Around 4-6 water bottles

Average Temperature of Instant Ice



In this graph you can see the temperature of the water bottles before they went into the freezer, when They came out of the freezer and after they turned to instant ice.

