

Stringy Ice

On SCOPE's H₂O episode, Julia picked up an ice cube using just a piece of string and some salt. Here's how you can try the activity at home:



What you need:

String about 40cm long
Glass of water with ice
Salt

What to do:

1. Lay the piece of string over an ice cube in the glass.
2. Sprinkle some salt over the top of the ice cube.
3. Wait about two minutes.
4. Carefully pick up the piece of string from either end. You'll find the ice has stuck to the string!

What's happening?

Water freezes and becomes a solid at zero degrees Celsius. Our freezers at home go down to about 18 degrees below zero, which is more than enough to bring water down to its freezing point.

If you take ice out of the freezer and leave it at room temperature, it won't be long before it all melts. Although salt changes how fast it melts – an ice cube with salt sprinkled on top melts faster than one with no salt.

This happens because salty water melts at a lower temperature than fresh water, which means it takes less heat to melt salty ice.

So when you sprinkle the salt over the string, the top of the ice cube melts faster than usual. But as the salty top melts, a layer of water builds up and the salt becomes diluted. This decreases the salt concentration on top of the ice cube and raises the freezing point again. That allows some of the water on top of the ice cube to freeze again and this newly frozen water traps the string.

In really cold parts of the world, people take advantage of this property of water by sprinkling salt on icy footpaths and roads to help it melt faster!